

**ADDRESSING ANXIETY THROUGH MATHEMATICS:
FROM DEMANDING PERFORMANCES
TO GIVING AUDIENCE**

by

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Abstract

In this dissertation, I inquire into the conditions of anxiety in mathematics learning, doing so by invoking a narrative of work with one such anxious learner, not as exemplar of anything perfect, linear, precise, or even the budding of technique. It is rather a muddling through with a sensibility of respect for a person, a discipline, and the possibilities inhering therein. It ultimately comes to be a story about giving audience to a self and a subject discipline as best I might, on that self's and that discipline's own terms rather than acceding to a Platonic demand to perform according to inaccessible ideals that would construe the learner in the terms of the discipline.

Taking seriously the world in a grain of sand, the narrative serves as hermeneutic window onto a pervasive issue of absent trust in self, in the other, and in the capacity to learn, be, and become well with and through others in the world.

In the process, I interrogate Cartesian, narcissistic, and mathematics anxieties at the root of present systemic pathologies in education, and individual and collective struggles to be well, mind-in-body, given that unavoidable paradox of singular plural being. I address the consequences of understanding learning as autopoietic becoming under conditions where learning is regularly circumscribed by an after-the-fact insistence on orderly construals of knowing—learning strangely positioned as at odds with the messy, unordered, non-linear cognitive work of conceptual formulation. And finally I explore the play of mathematics between the world as given and therefore discoverable and the world as made and therefore conceivable. I come to describe that play as through anxiety into a stillness of something beautiful, always just ahead, though enticingly present to curiosity's possibility.

Preface

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Dedication

For Michael. For cultural sinks wherein have settled invisible histories of hurt. Do not judge us by the superficial markings we bear.

For the fiction of innocence, preserved at tremendous cost;
for injuries not visited elsewhere;
but most of all
for relentless courage.

1 Complicating the Conversation about Anxiety

“Ours is a collective teleology, and its creative engine is a conscious mind that has assimilated the algorithms of a culture and is thus a vehicle through which the collective cognitive-cultural hierarchy can act” (Donald, 2001, p. 324).

Taking seriously Donald’s premise that culture is enfolded in and unfolds from the individual, this dissertation explores the conditions prompting anxiety in learning—conditions writ large and yet particular and situated. It is a study of the “world in a grain of sand.”

The inquiry proper arises out of my two-year work as teacher-researcher into and through one moment of severe mathematics anxiety in the person of Matt¹. I analyse the character, quality, and context of difficulties enveloping this high school student’s struggle with himself through mathematics. The research follows both to and from the exemplary case: Clinically diagnosed anxiety in one person is found to entangle in larger socio-cultural anxieties that press particular schooling practices. As such, the situated account serves as hermeneutic window into the pathologies of a system, provoking critical insight into issues of learning and teaching. Might mathematics anxiety be usefully thought the canary in a coalmine?

In particular, I lay forth persistent, pressing, and irresolvable incoherences that characterise systemic and local pathologies, these theorised to condition anxiety both at the level of individuals but also across and from the systems that individuals inhabit and that they collectively construe. Moreover, I explore pathology’s signature in rigid cover

¹ This name is a pseudonym as are the names of the various other participants narrated in the study. Together with changes in particular distinguishing features, these alterations protect identities without changing the essence of the study.

stories, cling to, however contradictory in nature, as first line defenses that deny internal discord either by dissociation or externalisation. Like the child who, with chocolate sputtering in mouth, adamantly insists to have not eaten it, such actions express some version of the frightened refrain “not me”—that self-protective refusal to even think that things could be otherwise. Still working to and from the situated case, I explore how each denial, meant to smooth incoherence out of sight, presents a neat façade, but one at odds with experience: The contradiction instrumentalises yet another iteration of incoherence. In this way, as Lacan predicted (in Baldino & Cabral, 2008), anxieties move: They shift within the self and according to context; and they evoke, as shall be developed, transferences across persons and intergenerationally through patterns of caregiving. Indeed, if conditions are such as to allow the unchecked propagation of an insidious sort of anxiety across systems then a pathos of historically conditioned, socio-cultural angst arguably makes “sense.”

You are about to encounter what can perhaps only be described as an unusually expansive yet intricately detailed study of learning and the occasioning of anxiety in learning and across learning systems. Briefly the trajectory can be summarised as follows: I start in Chapter 2, by introducing Matt together with the problem of anxiety, ubiquitous in mathematics learning, as reported in educational literature and theorised across broader discourses. This beginning prefaces the multi-faceted core of the dissertation where I follow three separate ways in: One broadly philosophical (Chapters 3 and 6 especially), a second empirically informed (notably in Chapters 4 and 5), and an interwoven third in the story of Matt (Chapters 3.5, 4.5, and 5.5). These strands come together again in Chapter 7 to frame the issues in a fulsome manner. From here, the

dissertation shifts to conclusions and suggestions as, in Chapter 8, I entertain discussions of trust and control, illusion and disillusionment, these leading to a resolution of sorts in Chapter 9 where I develop an alternative in the framing of teaching as giving audience.

The storied account introduced in Chapter 2 roughly mirrors the trajectory of my teaching and researching work with Matt—a dialectic tacking across multiple (trans)scripts: Those at play in the discipline of mathematics; conversations with Matt and his parents; the structures scripted into a distance program; telling research on mathematics learning and teaching; popular conceptions of anxiety, a cultural malaise, and “kids these days;” multiple eavesdropping excursions into a variety of potentially informing scholarly discourses; and my own storied experiences in mathematics and education.

Chapter 3 describes the philosophical perspectives informing the dissertation. I introduce Jean-Luc Nancy’s elaboration of Heideggerian existentialism in a paradox that Nancy develops as *singular plural being*² (2000). Nancy theorises the strangeness of any singular identity given the case of our “becoming” ourselves in no other way but through an originary commonness with others. This third chapter critically sets up the two that follow wherein I probe leading edge research in affective neuroscience and child developmental to explore the motivational why and the procedural how of this “becoming with.” In other words, I subsequently intend Nancy’s paradox of singular-plurality in

² The expression “singular plural being” is drawn from Jean-Luc Nancy’s essay of the same name, and according to the sense given in that essay. Note that, as per Nancy, the three terms can be rearranged in all six permutations without disrupting an intended meaning of Being as essentially a “Being” defined in the and as the inevitable “with” of existence (see pp. 28–34). Nancy writes, “Because none of these three terms precedes or grounds the other, each designates the coessence of the others. This coessence puts essence itself in the hyphenation—‘being-singular-plural’—which is a mark of union and also a mark of division, a mark of sharing that effaces itself, leaving each term to its isolation *and* its being-with-the-others” (p. 37). Following from Heidegger’s existential analytic, Nancy develops a coexistential analytic in terms of a “self” (2000, pp. 93–99) of singular plural being.

biological terms that understand the challenge of learning as ongoing recursive enfoldment of self into and with world in manner as to always hold viable sufficiency as precarious priority. The research reviewed across these rather thick middle chapters shapes a sense of evolutionary predispositions at play and the early interpersonal paths begun in response to the challenge of maintaining self-continuity in an ever-evolving³ world.

Alongside discussions of Nancy's singular plural being, and also in Chapter 3, I bring Butlerian interrogations of agency and autonomy as leading questions for complexity thinking and the notion of learning as *autopoiesis* (self-creating⁴) developed by Maturana and Varela (1980). Complexity theory sets Nancy's singular-plural paradox of being in non-dualistic post-Cartesian terms where mind and body each entail the other. Moreover, the fractal imagery of complex life systems situates the singular in the plural where each singular at once comprises its own plural. Quite literally then, complexity conceives singular plural beings through a series of nested life systems, not confined to human being—each unity arising and comprising smaller-scale unities that are functionally coupled together. At each such level of nested emergence, (a) “being” is understood to paradoxically exist both onto itself but also as partial⁵ part composing broadly encompassing emergent entities that are likewise “being(s)” onto themselves. In

³ Note that I when I invoke the word “evolving” I do not mean to suggest that such evolution be in the direction of better. Rather a world that evolves is simply a world that changes itself and in the doing continuously makes itself into its own irrevocable difference.

⁴ The term “poiesis” arises “from Gk. *poetes* ‘maker, author, poet,’ from *poiein* ‘to make, create, compose,’ from PIE **kwoiwo-* ‘making,’ from root **kwei-* ‘to pile up, build, make’ (Harper, 2012). And create has etymological roots to “L. *creatus*, pp. of *creare* ‘to make, bring forth, produce, beget,’ related to *crescere* ‘arise, grow’... from PIE root **ker-* ‘to grow’ (Harper, 2012). Autopoiesis as self-creating names a poetic ongoing self-making, but one that crests, and is marked by the ebb and flow of life begetting life.

⁵ The adjective “partial” flags both partiality as not impartial, but also as physically one element composing something greater than the sum of its parts.

such frames, learning becomes more broadly conceived as a life's negotiation of ongoing viability and this is not only limited to multicellular organisms. Uni-cellular organisms (e.g., an amoeba or a human liver cell) and collectives of multicellular organisms (e.g., an ant colony or a nation) do learn as well. Admittedly, we humans understand ourselves as the only life systems to self-consciously claim autonomous self-sense, to act on belief of that autonomy, and to ask after the conditions of autonomous becoming.

In thinking all of these contexts, and describing what I understand about the conundrum of singular plural being, is Judith Butler's theorising on the a priori conditions of the construction of the self. She writes,

It is clearly not the case that 'I' preside over the positions that have constituted me.... The "I" who would select between them is always already constituted by them.... No subject is its own point of departure; and the fantasy that it is one can only disavow its constitutive relations by recasting them as the domain of a countervailing externality. (Butler, 1992, p. 9)

It is unclear what can be properly cast as within and without the self. Common histories and present opacities blur distinctions. The self that one is at any given moment arises at the interplay of a prior-moment's self and that prior self's accessible world at the borders inside and outside the self's self-made boundaries. In short, the worldly elements out of which one fashions each subsequent moment of selfhood entail, paradoxically, the self that thus fashions.

The complexities of these lived paradoxes and the opacity of the self to the self return a problem of ethics, which for me must underpin all our theorising and practising in education. In her book *Giving an Account of Oneself* Butler leaves the reader with an

eloquent articulation of what could be reinterpreted in Nancy's frame as an ethics of being singular plural.

Ethics requires us to risk ourselves precisely at moments of unknowingness, when what forms us diverges from what lies before us, when our willingness to become undone in relation to others constitutes our chance of becoming human. To be undone by another is a primary necessity, an anguish, to be sure, but also a chance—to be addressed, claimed, bound to what is not me, but also to be moved, to be prompted to act, to address myself elsewhere, and so to vacate the self-sufficient "I" as a kind of possession. If we speak and try to give an account from this place, we will not be irresponsible, or, if we are, we will surely be forgiven. (Butler, 2005, p. 126)

Thus, Chapter 2 sets the problem and 3 sets the context for an ongoing and unavoidable struggle, one ultimately ethical, begun in infancy of selves always already given, though not determined, of prior histories. Each self shapes itself as recognisable entity with discernable boundaries, yet boundaries nonetheless permeable to a world that affords the conditions and occasions the opportunities for that becoming.

In Chapters 4 and 5, I turn then to the inherited biological motivations for ongoing self-creation (taken out of and with world, consciously or otherwise). Evolutionary history has generated affective sensitivities and sensibilities to primary being as at least crudely directed toward suitably viable, continuous selfhood. The challenge presented by Nancy and contextualised up and down nested systems by Maturana and Varela is also one empirically studied in contemporary psychoanalytic work on early infant and child

development, the discussion of which follows in Chapter 5's "how" of babies doing themselves into (a) knowing being.

At the same time, we will not lose sight of the story of Matt. Chapter 3.5 considers his circumstance and introduces the near-characters in his world and the stories recounted to explain away difficulty. Following the excursion into the rudiments of affect and motivation in Chapter 4, we return to Matt in 4.5 to hear his voice as spoken through mathematics. Next we delve back into the literature of childhood development and attachment theory in Chapter 5 that butts up to Chapter 5.5 and a last, threaded excerpt about Matt, this time foregrounding self-ownership, illusions, and disillusionment in schooling. Rounding out the dissertation's body segment, Chapter 6 revisits anxiety, beginning again with the philosophical, this time in a discussion of Cartesian anxiety drawn principally from the concepts introduction by Richard Bernstein in 1983. Chapter 6 closes with an inward turn to narcissistic anxiety and psychoanalytic perspectives on the edge of narcissism pathologised and medicalised.

At this point, and before delving into the culminating chapters, a schematic might be helpful. The considerations, so far introduced, describe also the frames through which I have speculated on the conditions of anxiety's emergence in life/learning systems. At risk of laying flat something far more unruly than any schema would suggest, I offer Figure 1 as diagrammatic expression of anxiety conceived according to this complexivist's understanding of the nested nature of learning systems.

Figure 1. The transphenomenality of anxieties

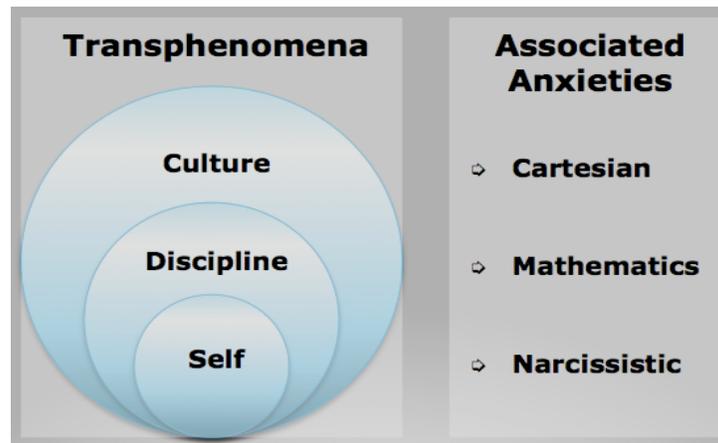


Figure 1. Nested learning systems suggesting nested anxieties.

The diagram depicts the individual learner unfolding from and enfolded in the cultural collective. The discipline, in this case mathematics, comprises a shared component of that cultural collective and, though not alive in the organic sense, is bootstrapped to the collective (in manner developed by Davis & Sumara, 2006) and so too bears the markings of a complex learning system within which the learner finds her or himself.

I agree with Thompson when he affirms, “We can trace a path from life to consciousness to intersubjectivity and culture that can do justice to our existence as living bodily subjects” (2007, p. 411). Ultimately, I trace the implications of this affirmation, doing so by rooting the anxieties—Cartesian, mathematics, and narcissistic—to common questions of existence. Broadly, we could say that this inquiry asks what new insights might be gained from a transphenomenal, transdisciplinary, theoretical investigation into the existential challenges of autonomy and collectivity, self-identity and belonging, of Nancy’s philosophical paradox of singular plural being (2000), and Maturana and Varela’s biologically grounded notion of autopoiesis (1980).

Moving to the concluding sections of the dissertation, Chapter 7 braids back together the various strands that have been teased apart, doing so along a common theme of the anxieties of demanding performances and imposing worlds. The point of Chapter 7 is to prompt a compelling direction into a different way of conceiving teaching.

In Chapter 8, I revisit anxiety again, this time seeking a tentative, potentially more fecund, reframing of our humanly shared condition. I consider trust, control, and the play (as articulation) of learning systems and propose a schema of what some might call a general theory of learning—a dialectic of illusion and disillusionment as the movement of autopoietic learning in structure-determined systems. The mention of structures prompts questions of control and determinism. At the same time, notions of illusion and disillusionment call to mind issues of trust and voluntarism. To address these questions I turn to Guido Möllering's duality of trust- and control-begetting structures (2005, 2006) parlaying his theorising into Winnicottian perspectives on play and reality (Winnocott, 1971/2005) and the role of illusion and disillusionment as central to the play of sense-making.

The dissertation's final pages offer up, what I hope to be a helpful metaphor of teaching—one that nudges us away from demanding performances. In contrast, I develop the notion of giving audience to the sense-making play of learners who, with increasing refinement, articulate themselves into being with and through disciplinary scripts as living artifacts of world.

In sum, somewhere in our biologies, between the play of creativity's loosening and reassembling (the illusioning bits) and the work of noticing the material world's interruptive corrections (the disillusioning moments), is the kind of imagining able to

usefully re-member pasts into any number of projected tomorrows (the citing/sighting roots of agency). Whereas we might want to provide possible imaginings for people who seem unable or too frightened to do this themselves, I wonder at the wisdom of “doing for” the learner versus “being with” them in their doing for and of themselves? It seems to me that in the present cultural moment, anxiety compounds upon anxiety, arguably conditioning a hypervigilance gone viral.

Instead, in this dissertation, I turn to other ways of framing the challenge of anxiety. I consider the conditioning circumstances of non-rigid dynamic structures that form and work us and that set the rules of play within which we exist. Anxiety entails in fear that we will not survive changes in the structures that, at once, structure us and that we structure. Whereas the definitional form of structures expresses a directionality and a force that works us,⁶ their fluidity of moveable joints makes possible relational play as the proper possibility of creative movement.⁷ Like water—neither rigid as ice nor unruly as vapour—work and play in potent and fecund measure (respectively) would permit and prompt learners to be thoughtful imaginers, creating illusive foundational schemas into precarious being and then, neither haplessly nor in angst-free conditions, toiling to refine those contrivances against a real-enough disillusioning world.

At the same time, and announcing a pragmatic philosophical stance, I want to be clear that I do not offer any of the forthcoming speculation as absolute or even relative truth. I am, rather, interested in what might come of bringing together different conversations. In that intention I am mindful of Judith Butler’s words.

⁶ The meaning of work that I am using is consistent with the relationship of “work = force x distance” and defines work as force effectuating movement over a directed distance. The etymology of work derives from “Latin *urgere* ‘to press hard, push, drive, compel,’ from PIE root **werg-* ‘to work’” (Harper, 2001–2012).

⁷ Here I do explicitly invoke play in the way that Gadamer develops has developed it (1975/2004, pp. 110).

It may be possible to show that the question of ethics emerges precisely at the limits of our schemes of intelligibility, the site where we ask ourselves what it might mean to continue in a dialogue where no common ground can be assumed, where one is, at [*sic*] it were, at the limits of what one knows yet still under the demand to offer and receive acknowledgment: to someone else who is there to be addressed and whose address is there to be received. (Butler, 2008, p. 21)

Neither psychoanalyst, neuroscientist, critical theorist, complexivist, nor philosopher, like Butler “I make eclectic use of various philosophers and critical theorists in this inquiry. Not all of their positions are compatible with one another, and I do not attempt to synthesise them here” (Butler, 2008, p. 21). This dissertation is a transdisciplinary offering seeking a middle view and direction—one unavoidably peculiar to my own meandering enquiry that ran betwixt, between, and amongst what for some might be considered opposing discourses. I am aware of the incoherences, as am I of a desire for clear through lines.

This work manifests an urge then, that is but one tangential take, mine, given as narrative interpretation along a curve of convergences held together long enough for the telling. It participates in that conjuring called sense-making and derives from a transdisciplinary play. And, if I had my druthers, it would press the opening of a possibility around what it might mean to consider ourselves, individual and collective, with a shrewdness of unromanticised generosity that gives audience in a co-presencing each to the other.

At once presaging and conditioning my own ethical concerns, Butler writes, “I hope to show that morality is neither a symptom of its social conditions nor a site of

transcendence of them, but rather is essential to the determination of agency and the possibility of hope” (2008, p. 21). To this I interject Lachmann’s humor that seems uncannily relevant to me.

Psychoanalysis was invented by obsessionals to treat hysterics. Obsessionals take themselves very seriously and generally have trouble seeing absurdities in themselves and in life. However, hysterics, having sexualized their experiences, are quite capable of fooling around. (2008, p. 91)

Wishing to frame my biases in explicit awareness of agency’s entanglement with issues moral and ethical, I admit to having been obsessed—a questionable claim to legitimacy indeed, but obsession has worked me. I have likewise been exercising a capacity to “fool around,” to play and thus imagine well.

For reasons of inevitable human partialities, I thus close this introductory chapter by calling attention to motives or, more precisely, by pointing in the direction of their opacities from whence meanings, given in and as bodily experience, press enactments of self. To that end, as latecomer to academia, I admit sadness and shock at the pervasiveness of what, too often, has come to me as a fearful unwillingness to consider that which moves the other—that other, positioned as a diametrically opposed “not me,” enacting beliefs fundamentally at odds to my own. In my reckoning, there has been no shortage of vulnerable “not me” candidates available to shoulder the blame for a problem we construe as the anxiety and underachievement of children in mathematics. Indeed, we have pointed the finger at management, diversity, textbooks, effort, attitude, parents, teachers, assessment, technique, gender, biology, stereotype, tracking, and mismatched styles—to name but a few. In so saying, I do admit both a certain naïveté and a stubborn

blind spot to my own enactments of the same. Surely education offers no immunity to life's good-enough-in-the-moment fixes that, when left untended, do carve out habits of certainty from and to an ambiguously given world.

Importantly then, as in any narrative, the tale woven here, and speculated through and with, becomes in the telling a work of my own contrivance. The thing we might call truth would reside in the cogency and usefulness given of and endowed by its audience. I am grateful for any audience. Though anchored in world and exemplary of world, coherences I might make are consequences of my own partial imposition. No matter how broad a consciousness I seek to embrace, nor how much I am able to compellingly resolve ambiguities in ways seemingly useful, such coherences necessarily emerge out of degrees of opacity of this self to herself.

So I rally effort to resist speaking the story that the minimalist self of me tells me to say, the story that dictates how and why things are the way they are—a short jump to how they should be, the right way. I encounter in the revisited reading that I have not succeeded well-enough in resisting the urge to point out a problem elsewhere in a way that keeps my pointing-self distant and unimplicated. To the converted this might not come as problematic. Speaking from and with a variety of disciplines I expect the “already converted audience” to be unusual. In as much as I do say “not me,” I have refused growth and the possibility of recursive self-change in favour of self-preservation in a world of beings living an unsustainable “as if” of bounded fixity, each self unto that self.

I do add that I have been particularly heartened and moved by those daring to visit anew the unattended, to listen well, hermeneutically so in the sense described by Davis

(1996) where authority is entered collectively and where teaching moves in directions “participatory, transformative, concerned not merely with questions of knowing and doing, but with questions of personal and collective identity” (Davis, 1996, p. 262). And I have likewise been particularly heartened and moved by those hermeneutic listeners willing to enter into what William Pinar has described as a “complicated conversation” (2004, Part IV). Intending to join a consciousness of learning as mindfully participatory, with Tony Brown (2008b, p. 110) who cites Winnicott, I hope that such learning be lived, less in response to an anxious demand of “doing and being done to,” and more in deliberate celebration of “being and being with” other and world. It has been gift to even broach such radically complicated conversations as are at play in the works of the various thinkers who have been my virtually real companions.

In broaching present conversations, I’ve intended my questions to generously, but daringly, trouble present “commonsense” habits of catering to anxiety. I wish to move beyond that gesture asking: How can we interrupt habits of treatment, these mostly absent the considerations of history and context, where the quick solution reduces to “fixing” the nearest traumatising trigger? Moreover, how can an investigation into anxiety’s etiology help us think otherwise, that we as researcher-teacher-learners find ways to prompt our students into kindly self-recognition and critical self-reflection in and with an engagingly challenging, educative world?

Entering thus, I trust this contribution leans well in the direction of complicating the conversation around mathematics anxiety and that it does so without losing itself or the reader therein. Coherent threads do need maintaining, for the sake of sanity, mine and yours, and if only as resting places of assemblage—not as covering truths. Consider,

then, the pages to follow as an attempt to parlay differences across the landscape of education and that have conditioned much of my 25-year teaching vocation in schools. The virtual reality assembled is, to be sure, a virtually real fiction—as are all the senses we make. I hope it to be a useful one.

We turn now to Chapter 2 and an introduction to the problem of anxiety in mathematics.

2 It's Not About the Math—Really!

“Whoever has learned to be anxious in the right way has learned the ultimate”
(Kierkegaard, 1844, as cited in Grøn, 1994/2008, p. 1).

It is not ‘knowledge’ or ‘mathematics’ that is represented, it is the person, the self, the *subject* who is constituted in so far as he/she makes himself *represented through signifiers*, briefly, insofar as he/she talks; and talking presupposes a community of listeners. (Baldino and Cabral, 2008, p. 73)

In this chapter, I introduce Matt, a mathematically anxious young man with whom I would work for two years. Excerpts from our conjoined research-learning story—flagged in italics—afford illustrative examples tethering the dissertation to the world of lived experience. I report on the prevalence of mathematics anxiety and recount various attempts to measure and treat it away. Considering schooling contexts where reductionist and objectivist “management” practices continue unabated, perhaps anxiety is less rooted in mathematics and more insidiously encouraged by expectations Modern. Ultimately Matt’s narrative serves as hermeneutic window into existential anxieties of being and becoming, absence and presence, and the solutions that people fashion to resolve untenable ambiguities.

Conspicuously Absent: A Story

It was already December 2009 and I’d been tutoring Matt now for half a year. I sat with his parents, Warren and Sonia, in their living room, uncomfortably aware of their son’s absence, especially since my request that he participate in the conversation, though previously acknowledged, came to me only now as refused. To prompt to mind what I hoped had been accidentally dropped, I asked, “Where is Matt?”

“Downstairs, doing...” I admit to not registering Sonia’s elaborations. Though the sounds were audible, I did not following the meaning, so loud was my effort to make sense of intention. Knowing we would be speaking with “Matt’s best interest in mind,” that is, “on Matt’s behalf,” I was uneasy at his absence, and this was true even though I understood that he would be relieved in excusing himself. Indeed, how much more awkward would it have been to speak for him in his “presence?” All things considered—I mused, in the unconscious more than elsewhere—maybe it was better this way.

“If you think about it, it’s like three strikes, Grade 8, 9, and now 10,” Warren explained about school. Matt had come a long way in the space between last June and now, but apparently not far enough. How could he have? Looking back at the past summer and fall of mathematics—schooling poorly buoyed (it would seem) by Matt’s and my quasi-weekly tutorial sessions—a familiar story beckoned, even as it threatened, of failed attempts to compensate for the inadequacies in Matt’s mathematics education. What odd comfort is availed in the familiar, all-ready, coherent narrative? In any case, it was indeed a story that had, over the years, crept insidiously into acceptance as the defining and definitive one. The present meeting had been prompted by a newest urgency: With 32 percent in his first report period for Grade-10 mathematics, Matt could not statistically pass the year.

Settings and Contexts

Mathematics anxiety in young children is closely related to unhappiness at poor performance. However, it has no... relationship to actual arithmetical performance, self-rating, or liking for maths; whereas the[se] latter three measures are all closely related to one another. (Thomas & Dowker, 2000, p. 3)

Supporting the findings of Thomas and Dowker, researchers Krinzinger, Kaufmann, and Willmes found “no significant association was found between calculation ability and math anxiety [in early primary school years], which contradicts the consistently reported negative correlations... in adults (Hembree, 1990)” (2009, p. 9).

Apparently primary school children (six to nine years old), who don’t do well at mathematics, know their difficulty and don’t particularly like mathematics either. At the same time, difficulty in mathematics for the young, equates neither to anxiety about mathematics nor to unhappiness at the prospect of not doing well in it. Instead, and most notably, those children for whom happiness hinges on performing well are the children who are anxious. Yet by the time they are adults—and for many, long before that—the well-documented deleterious effects of anxiety on learning (Bandura, 1993; Hattie, 2009, pp. 49–50) will have in all likelihood pulled them into a downward spiral of mutually reinforcing mathematics anxiety and compromised ability (Baldino & Cabral, 2008; Burns, 1998; Dowker, 2005). It seems that a particular kind of caring⁸ about performance might breed an anxiety to inhibit learning and ability. What would it mean to “be anxious in the right way” (Kierkegaard, 1844, as cited in Grøn, 1994/2008, p. 1)? Might we read surveillance as over-caring and evidence of a diffuse cultural anxiety that conditions a pedagogy for and of the anxious? Would it be useful to understand escalating accountability measures in terms of cultural intentions to make things right by identifying and managing away difficulty? Assurances such as “Failure is not an option” and “No child left behind” uttered as self- and other-determinations give license to a

⁸ Appropriately, the etymology of care hails back from “cry” to “lamentation” to “grief” (Harper, 2001–2012) and my use here too suggests an anxious preoccupation in the sense of crying, lamenting, and grieving about our children’s performances.

hypervigilance that both expresses anxiety even as it conditions it. Maybe it's not about the math.

Let me formulate a proper introduction:

I met Matt after his “successful completion” of Grade-9 mathematics. His parents had just hired an independent psychologist to conduct a one-day psychoeducational assessment. The report described Matt as, “an amiable and socially skilled teen who presents with a disarmingly candid manner.” Yet, he exhibits “clinically significant levels of anxiety, including many worries and guilt feelings... ‘somatic complaints’ suggestive of anxiety.... [and] a sense of personal inadequacy... related to concerns about achieving his goals.” Matt shows notable interpersonal strengths and average or above average abilities in verbal, spatial, and logic skills. However, “extreme deficiencies in mathematics”—evidenced in limited short-term memory for discrete symbols (i.e. letters and digits)—contributed to “trembling hands” during his assessment. Noting Matt’s recourse to “counting ‘tick marks’ in order to add ‘7 + 5’,” the psychologist wrote, Matt “appears to become so confused and anxious... [as to impede] his capacity for clear and logical thinking.”

Ah, the phrase “successful completion”—juxtaposing the movement of succession against the stoppage of completion! In a culture bent on the effective bulk-management of populations of learners understood as vital future commodities, the lock-step procession of selves through learning systems benefits from unambiguous designations of departure and arrival levels. Thus, successful completion of Grade 9 Mathematics grants passage and sanctions achievement in the forcefully authoritative name of a taken-as-assumed school curriculum; that is, a curriculum individually taken as

noncontroversial collective assumption. Matt wears the credential in the sense of escape and admission into more of the same—a badge tainted by the consummate awareness of his own debilitating anxieties and vexing inadequacies. Marked in passage he cannot but mark himself, imposter—at times clever, at times desperate in that capacity. And so, the game is up, or rather continues into a next iteration, of “getting by.” Each year the feat becomes more difficult, even as the stakes climb.

George Herbert Mead “defined the response of the other as the meaning of a gesture. [H]e was... describing a process of learning” (Klin & Jones,⁹ 2007, p. 11). According to Mead, as explicated by Klin and Jones, one’s actions become infused with affective meaning as a result of the perceived and perceivable reactions of others to those actions.

These meanings are composites of feelings of pleasure, displeasure, fright, tenderness, safety and lack thereof, helplessness, panic, predispositions to approach or to flee, to hit or to caress, or, more generally, they are as complex as there are experiences resulting from the interaction of people.... Mead’s mental meanings are as real and immediate as the reactions of others were at the times of incipience or change of these constructs.

What meanings about schooling and self come as given and taken up by learners who, succeeding to varying degrees at fooling the watcher, emerge on the “winner’s” side of achievement-empty passages? In each subsequent iteration, they feel themselves but one

⁹ Clinical psychologist Ami Klin and neuroscientist Warren Jones—Eminent Scholar and Research Director (respectively) at Emory University School of Medicine, Marcus Autism Center—are foremost researchers in developmental psychopathology.

step closer to that denied catastrophic possibility of being exposed in the permanently felt failure of never measuring up.

Father was given to sociological interpretations on the deep inadequacies of Matt's schooling—perspectives he was eager to share, and to which Matt was anxious to agree. Mother, for her part, influenced greatly by psychology's role in education, leaned to a no-nonsense approach in managing the measurement and evaluation aspects of Matt's getting by. She explained,

the way that I think about it is two parallel tracks that intersect a good deal of the time and maybe not all of the time though and one really is about helping him develop much more confidence and a sound foundation that he can build on, but there's also getting the course done too. And those things don't overlap perfectly. (March 4, 2010)

Affirming Sonia's position, Warren described the "compromise" of a "dual track.... [as] figuring out what is the stuff that we're just going to have to do to help get him through the test" (March 4, 2010).

A month later we would have the following exchange:

Lissa: Matt is still not quite prepared for the Section I assignment because it reviews all of basically Grade 6-through-9 mathematics. He is more able with Section II, so as I said before we are working back and forth making sense of the newer concepts in terms that reinforce, revisit, and enfold prior ones.

Sonia: Lissa, Matt has already written, submitted, and received his grade for those assignments.

Lissa: He has?! But I don't understand, there are whole sections incomplete and unaddressed. [I am thinking, "Oh so that's why his copy went missing from his binder. But why didn't he tell me this when I asked? Did he actually not remember?"]

Sonia: We couldn't wait forever, Lissa. You have to understand that assessment and learning are two separate tracks. Assessment is the logistic march through a curriculum that we have to follow if we are going to get done in time. His learning with you is something different and can move to your own rhythm.

Lissa: Yes but it would be awful to be assessed on something that you didn't understand. That doesn't make sense as a confidence-building strategy. How can he gain confidence that way? Well he can't have done well.

Sonia: It doesn't matter really in the end. He got in the 30-percent range on both assignments but at least now he can move on. It's all fine. You have to let these things go.

Lissa: I am trying to think how that must have felt, must feel. I mean, it can't feel very good to be lost and get poor grades. And he was beginning to feel good, to get it. I can't stop thinking about how it would feel to be in that position.

Sonia: Well, Matt is like anyone else these days, just doing the work to jump through hoops, not for its own sake. He's used to it and that's just the way things are.

(April 6, 2010)

Measuring and Managing Anxiety

The full educational experience includes the affective charge of current pleasures and anxieties, our relationship to the contents of study, our immediate experience

of the relational dynamics within the group, and our attempts to defend ourselves from inner anxieties and to take inside ourselves the good parts that we recognise in others. We are constantly challenged by our need to succeed or fail, and our fears and hopes of being recognised or ignored. (Tony Brown, 2008a, p. 27)

In contrast to a psychoanalytic pedagogy that accepts that “wherever there is education there is always disturbance” (Brown, 2008a, p. 27), the commonsense expectation of education is that it can, should be, or even is on balance an “essentially a force for liberation, self-development and a smooth path to an adult role in society” (Brown, p. 25). If teaching is an “impossible profession” as Freud contended and education “the source of injury” as Melanie Klein advocated, then “a psychoanalytically informed pedagogy needs to take up the project of who I am and how I relate to others as a *central* [emphasis added] rather than peripheral theme” (Brown, p. 25).

It would seem however that schooling’s project has been to hide from view what Brown describes above as “the full educational experience” (p. 27). The goal is explicitly *not* to disturb, to let sleeping dogs lie—indeed, to vigorously deny signs of disturbance until they are unavoidable and then only to contain contaminating eruptions and collisions. The colloquial advice to would be disrupters is generally “to suck it up,” but things “sucked up” are only temporarily displaced, for “anxiety ‘is what does not deceive’” Lacan wrote (as cited in Baldino & Cabral, 2008, p. 64). Anxiety is the sign that announces a self, perceiving a threat to itself. Moreover, it is the threat, not its sign, that installs repression/dissociation as symptom-producing relocation of the difficult. “There can be no point in trying to avoid, suppress or overcome this ‘sign’” Baldino and Cabral write (p. 64) for “affect is never repressed, it just moves elsewhere” (p. 82). The

move to “treat” anxiety, or to relieve a subject of anxiety’s purported target, misses the crux of the matter. And likewise the effort to measure anxiety—that it might be located and treated away—is likewise fraught.

Baldino and Cabral write: “Quantitative treatment of data collected via questionnaires presupposes a transparent subject who could evaluate, without mistake or remainder, his or her objective situation about maths anxiety” (p. 64). However, in the communicative exchange implied in data collection the desires of two subjects press the unconscious into play. It is in this sense that anxiety is not necessarily reportable as a noted difference. That is, anxiety may well live as an unattended, unconsciously denied, condition of being. As such questionnaires the likes of MARS (Mathematics Anxiety Rating Scale) do correlate *responses* but the degree to which they correlate *anxiety* is another matter entirely. “Jacques-Alain Miller, the heir of Lacan’s copyrights... criticises the medical conception of the anxiety phenomenon” (Baldino & Cabral, 2008, p. 64) writing that such practice not only implies

that there is knowledge in the real, it imagines that this knowledge is reduced to the accountable signifier. This point of view, which comes from a sort of positivism, is that the real is reduced to this knowledge and thus evaporates this knowledge. (Miller, 2005, as cited in Baldino & Cabral, 2008, p. 65)

Schools have been, and continue to be, bent on managing measured anxiety out of view and therefore existence—enacting, at a top-down governance level, something of a regressive gesture to, what Melanie Klein called, the *paranoid-schizoid position*, where “unable to tolerate the rich complexity of... inner sel[ves], we fragment..., splitting off and expelling the intolerable bits, often associating them with other people” (Brown,

2008a, p. 26). Rather than claiming our intolerable parts, the approach is to cover over the signs of difficulty, labelling their displaced expression onto children—according to any number of “codes” these legitimising added funding to schools—while supporting people and systems in denial of anything amiss. Matt’s mom, as I came to learn, schooled in the discipline of psychology, was well versed in just these managing manoeuvres.

The problem of education then becomes the regulation of the problem of people; the ineffective teacher, the dyslexic student, the failing school, the pregnant teenager, the single parent: if only everyone were normal, the dominant ideologies imply, then education could return to being that benign, tranquil, untroubled process that is often association with metaphors of seeds and flowers and growth.

(Brown, 2008a, p. 24)

Perceived Self-Efficacy: The Fixing of Learners

At the end of the twentieth century in answer to the problem of anxiety and performance, not only in mathematics (though perhaps especially there), researchers in educational psychology turned to the construct of perceived self-efficacy, its association with success, and how to renovate it if gone awry. In his paper on the topic, considered a seminal piece in the history of educational psychology, Albert Bandura (1993) reported that perceived self-efficacy (as cited in both ability and self-control) correlates positively with achievement and negatively with anxiety. The relationships were found to be mutually reinforcing. Notably and problematically, the causal association from perceived self-efficacy to performance emerged out of controlled laboratory settings¹⁰ (see

¹⁰ Perceived efficacy in controlling one’s destiny here entangles problematically with enacted motivations to achieve goals. There is a disturbing presumption in this literature that with perseverance, one can control

Bandura, 1993, pp. 125–132) and, compounded with behavioural influences in education, came to be taken up in schooling practices of rewarding and praising selves into esteem¹¹ (Martin, 2007, pp. 80—81). In as much as success invigorates the spirit, few would likely question the sense, highlighted by these studies, that success breeds success. However, in lived contexts, it is hard won success, and not advancement effortlessly assumed, that incites courage and belief in oneself as agentive actor in the world. Neither is anyone likely to dispute the finding in the other direction: that confidence in one’s self-efficacy supports persistent and determined effort. And yes, intuitively at least, the confident and successful do seem less anxious. We need only examine our own personal histories to come up with myriad confirmations that instances of lower anxiety are associated with confidence and success.

Yet, a crucial proviso in Bandura’s paper ought not to have gone unattended, though point in fact, at the time it did: That perceived self-efficacy, as stance given and accepted from generously-perceiving others, is as precariously fragile as the next potentially-revealing challenge. That is, a donned self-efficacy does not bear up over time. In contrast, the so-called confident, successful, “non-anxious” learner is one who in some measure has had the experience of feeling more efficacious when moving, in some

both oneself and one’s environment and that the motivations for the goals one “chooses” (or to which one acquiesces) are within one’s conscious control and awareness.

¹¹ In his review of the literature on the “selves of educational psychology,” Jack Martin (2007) writes, “by the dawn of the 21st century approximately 3,000 studies of self-esteem and/or self-concept were listed in the ERIC database (Martin, 2004a)” (p. 80). Noting the lack of empirical evidence that self-esteem has any impact on school achievement (p. 81), he posits the motivation for educational psychologists’ concern for students’ self-concept and self-esteem as arising out of a deeper conviction that “high levels of self-esteem and self-concept are worthy educational goals in themselves” (p. 81). Moreover this belief is propelled by what Arthur Combs described as “a basic principle of democracy that ‘when men are free, then can find their own best ways’ [and that].... Self-actualising people see themselves in positive ways, and you do not get this from having failures” (Combs, 1961, as cited in Martin, 2007, p. 81).

sense, toward anxiety, rather than avoiding.¹² Though often heralded as “having arrived,” such learners do not see themselves in those terms. Summarising the research of M.M. Bandura and Dweck (1988), Dweck and Leggett (1988), and Nicholls (1984), Bandura (1993) describes these children as learners who “adopt a functional-learning goal”—that is, they view challenges as opportunities to expand their knowledge and competencies while errors are considered natural and useful informants to learning (p. 120). Not so readily deterred by difficulty, they “judge their capabilities more in terms of personal improvement than by comparison against the achievement of others” (p. 120). Indeed, as Dweck later develops (2006) being oriented toward growth arises out of effortful meaningful challenges engaged and met. Thus, growth-mindedness goes hand-in-hand with self-awareness in approaching learning; that is, in terms of appropriately selecting and approaching challenging tasks. There seems to be a greater sense of self, and ownership of self, in the growth-minded.

Sonia: All the report card said last week was, “Homework completion is necessary to success in this course.” What kind of a comment is that? It doesn’t even come right out and say he’s not doing it.... But, it’s true, he does seldom do homework in any subject....

Sonia: And right now his stress with science has displaced his stress with math.... You think he’s failing math badly, you ought to see his photography mark. Which

¹² I want to mark here an awareness of the emphases across these literatures on the observable and, with that, a tendency to simplifications and conspicuous absences of attention to the workings of mind, conscious and unconscious. It would seem that a growth-minded attitude is one to have in some measure, or perhaps in particular contexts, moved toward anxiety, and rather than meeting there the judging Other, found instead opportunity to build a relationship with that Other’s desire (as per Baldino & Cabral reference to Lacan, 2008, p. 74). I am, at present, too unfamiliar to take this line of thought much further, though it is one to consider in post-dissertation modes.

just means, “I hate this, I’m not doing anything. I want the hell out of here,”

Which is fine. It’s not a big deal....

Sonia: You know he never fessed up to his actual score on the last math test. I’m guessing he obviously failed it even though he thought he’d done well. He’s still sticking to the story that she hasn’t given them back. And, maybe that’s true.

Lissa: Oh? It didn’t cross my mind that he would be making that up.

Warren: Well it crossed my mind. [Laughing.]

Of pretense and lying Lachmann, writing in *Transforming Narcissism: Reflections on Empathy, Humor, and Expectations*, speaks about his client’s mother-son relationship saying, “He realized she preferred to be lied to rather than have to face ‘real’ issues and problems.... Ironically, in lying he met her expectations” (2008, p. 127). From the other side, in terms of the expectation to be caught in one’s lie, Lachmann drawing from Kohut (1966) adds:

The rupture of the selfobject tie that occurs when the child’s need for the omniscience of his parents is disturbed by their *failing* to catch their child in a lie. Herein resides a subtle violation of expectations, the consequences of which, according to Kohut (1968), would be noted in the person’s failure to transform the idealising selfobject tie into a set of guiding ideals. (2008, p. 125)

Sonia: Actually he’s never been very good at judging how well he’s doing at school.

Lissa: This focus on getting right answers seems to short-circuit him working on, recognising, what it feels like to understand.

Sonia: I confess I don't have much insight that would explain our perception of him doing better, having more of a grasp, more understanding, and yet that not being reflected in school.

Lissa: He's too busy worrying about passing to relax, to think. Before, when I asked, "What makes a good teacher?" he said, "I pass. Last year's tutor was good. She showed me shortcuts so that I could pass." And when I would ask, "How do you feel about that, don't you want to know why?" he would shake his head, "No, not really, I just want to know the quick answer." But then the other day he volunteered something different. He said, "That was a quick way and we didn't get into why, so I was still kinda lost. It doesn't help me figure out this next question." So he's either giving me what I want to hear or he's getting a sense of what understanding feels like. I think a little of both. Actually, the sense that I feel of a greater confidence seems to come as less resistance to wanting to know.

Sonia: M-Hm.

W: Right.

Lissa: Before, this shut off mode would kick in. His body would literally sink and his eyes would glaze over. It was like he'd already decided, "This is going to go beyond me, and I really don't want to go there." He doesn't do that as much now, except maybe when he's tired or sick. What I'm seeing is that when he gets into a direction, he has more sustained momentum without my input. But that hasn't seemed to translate to testing situations. When he feels under the gun, being watched, he just shuts right down again.

Sonia: It's true. He has commented that what he does with you is so completely different from what happens at school. And what happens at school is you have

to get the right answers to things and you need to do it on your own and you need to do it quickly. And he said “Math is actually interesting because it’s not just about calculating. It’s about ideas. It’s about relationships.... And he likes that. He said, “If math were like that in school, then that would be more interesting. But that’s not what it’s like in school.” So he perceives that difference. That what you do in school, the goal is quite different from what you and he do together. And that’s a good thing. We’ve tried to encourage him that that’s the interesting part of mathematics. The calculations are necessary but that’s not what it’s really about.

Lissa: What I know about math is from playing with it. You have to play with it. I have been finding ways to invite him in to play. And now it feels like he is on the cusp of going from “going through the motions” to thinking “hey, maybe there is something intriguing here. Maybe this that feels yucky can make sense.”
(December, 2009)

The anxious, risk-avoidant learner orients toward the certainty of the familiar as fixed, robust-enough self. Where the “fixed-minded” feels threat, the “growth-minded” might embrace opportunity (Dweck, 2006). For such anxious children especially, whether that anxiety is localised to a particular context or more profusely felt, actions taken in the contexts of anxiety tend to be less about doing for oneself and more about performing oneself before and for another. Such performances can be frightfully telling.

Sonia: He’s never been the kind of kid that you could get to do something cute, even as a baby, to get him to do it again. He doesn’t want people to pay attention to him in that kind of way.

Sonia: For a lot of things he would observe, observe, observe and then he would do it.... For example, he didn't crawl much then one day walked. So there wasn't a period of trial and error and that's true about a lot of what he does. He's not interested in trying things out and getting feedback and then getting better at it. He's always been like that. He has this whole internal process, where he's trying to make sense of things, become at least proficient enough that he can then perform something. And maybe that's part of the issue around doing presentations at school. I mean he doesn't ask questions either, ever. This has been a consistent thing in his school career. Teachers say, "I can't help him if he doesn't ask for help." Matt never asks for help.

Lissa: What if a teacher came by and said, hey what are you up to?

Sonia: He wouldn't like that. It would be like being called out. So I think it's a tough thing for him where he really is struggling with the content, the last thing he wants is to be asking questions that demonstrate that he doesn't know, or even having the teacher asking questions of him that he would perceive as drawing attention. So I think he's more comfortable working one on one. (December, 2009)

Not only do performances construct the learner against others but they do so according to Other-imposed criteria in manner as to judge and proclaim worth as fact according to measured capacity or incapacity. In the face of perceived demands on the self, the anxious learner wants for clear, unflinching guidelines when it comes to learning and assessment exercises. The more detailed, exact, and effortlessly doable the prescriptions, the easier to fulfill them, and the less second-guessing required to give

back, as in ape, what one is expected to know. Understandably, such individuals are more likely to gravitate to fail-safe tasks and teachers, programs, and schools known to minimise the possibility of missteps while guaranteeing success.

An outsider to the mysteries, possibilities, and capacities of sense-making in anxiety-provoking contexts, and frustrated at the audacity of expectations, a minimal self is pressed to see “having to exert high effort... [as] also threatening because it presumably reveals one is not smart. The successes of others belittle their own perceived ability” (Bandura, 1993, pp. 120–121). Where achievement is not conceived in terms of a sense made from within and neither in consequence to felt growth, there is argueably little motivation to exert effort. To fail for not trying can be less an indictment on the self than putting forth effort and still failing. Where inherent capacity is the extolled virtue, it is better to avoid the risk of that capacity being called into question.

Lissa: I don't know. You've got to do something that's healthy for you. It would be nice if you started to look at the wonderful goodness around you. Even your phys ed teacher, whomever that person is, you know? That there's a real person there with a whole lot of issues and there's some good stuff and not so good stuff and—

Matt: That's not good. Sigh. That guy's such an asshole. Yeah.

Lissa: Hitler was an asshole.

Matt: Yeah. He was.

Lissa: So I don't know. How bad is he?

Matt: Yup. At least Hitler didn't call me out in the middle of class in front of everyone and tell everyone I was failing [audible exhale].

Lissa: Is that what he did?

Matt: Yeah [nervous quasi-laughter]. That was kind of the last straw for me. It was, well, I don't even want to be here. Is that yours or mine? [changing the subject as he packs up his things]

Matt: So I guess I'll work on these and I'll work on the review.

Lissa: Yeah. You decide. I'm just tossing this stuff out. In working on the review, if you go there, don't skip stuff.

Matt: OK.

Lissa: If you run into—like I mean, I err in the other direction. This is the review here, do you want to put it—

Matt: Yeah, this is good.

Lissa: There's some wisdom too if you hit a bump in the road and it's kinds of tricky, to skip over it and go to where it's smoother and then you can backtrack.

Matt: But then you skip it and you just never go back.

Lissa: Yeah. You do too much of that. I do too much of what I'm advising you to do. I say like bear down, figure that one out, because there's a clue in there of something that you're missing, especially if it's at the beginning. It's like, why don't I get that? And look back and see. And for Pete's sake call me. Well not for Pete's sake, for your sake. [laughter]

Matt: [laughter] (April 14, 2011)

To be fair, the dichotomising of children along two learning trajectories, one fated in the direction of fixity another toward growth, becomes itself a “fixing” construction. These tendencies are fluid and contextualised within individuals and across situations,

arising as they do out of deep and early histories. Indeed, the conditioning of such histories constitutes a substantive topic to be developed in this dissertation.

Consider present habits and beliefs in education: Assuming the uninterrogated given of a now century-old practice of age-graded schooling, a simplified interpretation of the above efficacy literature might be captured in a common aphorism attributed¹³ to Henry Ford: “Whether you think you can, or you think you can’t—you’re right.”

Enter a failed legacy of an era of self-esteem still wreaking havoc in education—tragedy of an overenthusiastic reading on controlled studies where subjects, primed to believe they could succeed at a task, did indeed out-perform those not thus cued. But *perceived* self-efficacy, as ascribed and taken expectation of success—premised upon undiscerning assurances—discounts and diminishes effortful practice. Indeed, a received narrative of “yes you can” when it seems everyone can with little effort, or “yes you can” that alternatively confronts a lived experience of “no I can’t” and “see I didn’t,” sets up self-perception at odds with differently telling accounts in and from world. Where getting by is a readily achievable goal, the thought of investing oneself might seem foolhardy.

In short, a received narrative of self-efficacy when ill-supported in experience engenders conviction counter-productive to the honing and expanding of self in adaptive, consciousness-broadening engagement with world. On the one hand, the intention to ensure achievement by structuring away failure and appeasing an immediate spectre of anxiety, though well meaning, can set up a precedent that comes to be anxiety-provoking.

¹³ A possible origin of the aphorism may be: “If some man, calling himself an authority, says that this or that cannot be done, then a horde of unthinking followers start the chorus: ‘It can’t be done.’” (Ford, 1922/2007, p. 62).

On the other hand, where failure is not an option, why bother trying beyond the minimum required to pass.

Sonia: He would have taken biology except that he'll end up with the same science teacher he has this year, who he does not like.... She's actually not a bad teacher but she is mastery-oriented and Matt has a hard time managing. She has what I think is overly complex expectation of things you need to do before she'll let you take the test. Now Matt thinks that's very punitive. Right? "If I can do most of this stuff and I take the test and I can pass it, why do I have to do every single one of these things. Right." And she's also all about letting the kids have opportunity to raise their grade, and that too is I think very convoluted and a complex process and Matt really resists that.

Warren: He wants to pass or fail.

Sonia: I don't want to sit around and analyse what I know and don't know and have a discussion with the teacher about this. I think in many ways, she's very student-oriented, trying to maximise everyone's success, but there's something about it. Matt thinks of her as being like me.

Warren: He says I've already got one mom.

Sonia: I don't need two. That's the way he sees her endless efforts to improve his performance. As being maternal, that's kind of funny.

To repeat, Lacan writes, "To act, is to operate a transfer of anxiety" (as cited in Baldino & Cabral, 2008, p. 78). Matt does not thus act, or rather his action is the stoppage of action. Instead, we do: All of us.

Of what consequence is a milestone endowed to a learner as emblem of achievement if little if any movement, as effort, was implicated in the doing? Such accolades mark merit as gifted for one's throwness, for being and not for becoming. Moreover, they make effort unnecessary and superfluous. A reasonable adaptation to such practices, where learning systems do adapt according to a principle of sufficiency, is to expect and oft-times demand esteem consummate with perceived entitlement. Moreover, the mind in body conditions itself in response to demands in either the direction of atrophy or one of growing vitality. Where the signs and symbols of achievement have been granted rather than striven for, the learner learns atrophy and thus finds it increasingly difficult to rally effort or to risk failure.

The above structuring of certain achievement contrasts against rising accountability measures placed on now-anxious teachers and schools, increasingly held to bear the brunt of both effort and risk. In such conditions, can student "achievement," in and of itself, be confidence-building? How robust, how deeply felt, is a confidence premised on gain and recognition as one's democratic right and another's responsibility. In such constructions, success leads not to succession. Rather it announces a laurel to rest upon, to expect, to insist on, and ultimately to hide behind.

So while a rallying cry in the United States of "No Child Left Behind" declares a determination to afford guarantees that feel the noble and right things to promise, the best of intentions all-too-quickly devolve into a bad science of heightened mechanisms of surveillance on the purportedly measureable and regulable: to wit, via standardised assessments of student achievement and quantifiable coorelates in manageable teaching practice. Policies the likes of "no zero" (Cooper, 2009; Edmonton Public Schools, 2012),

social promotion (Levine & Levine, 2012), and Alberta's *Bill 44* with its restrictions on teacher autonomy (2009) seem at once symptomatic and generative of spiraling socio-cultural anxieties of "measuring up." From the perspective of educators, students and a less-informed general public are given to assume, even usurp, the roles of legitimate experts on teaching and learning. Lest education fail to accede to the rising demands of an argueably ailing populace, costly accountability measures serve a scrutinising eye to, among other things, rank teachers, schools, districts, states, and nations (see e.g., School Performance Report Cards, Fraser Institute, 2010; Trends in International Mathematics and Science Study [TIMSS], Mullis, Martin, Foy, & Arora, 2012) with a sensibility, less attendant to the lived exigencies of enacted curricula, and more to schooling systems as merchant suppliers to a competitive market. Incoherences abound.

No, the children and young adults are apparently not all right. Victims of a so-called "coddling culture," Generation Y (alternatively named the Millennial Generation or *Generation Me* as per Twenge, 2006) also face financial uncertainty as they work multiple jobs (Lunau, 2012). As students, or newly-minted graduates, they shift across a discordant space where assumptions of educational entitlement clash against an expectant less-forgiving work-world. Described as panicky, disgruntled, and more riddled by anxiety and depression than generations before (Twenge & Campbell, 2009; Znamer, 2012), they show signs of conditions of "minimal selfhood" characterised by Christopher Lasch in 1984.

Given these escalations of a general malaise among youth especially, could it be that mathematics anxiety was the canary in the coalmine—the ready symptom of an ailing society caught up in an over-zealous belief that certainty was a deliverable? Indeed,

quite possibly it's not so much about the math. Perhaps it never really was. That said, there might be something to be learned in studying the canary and admitting to the conditions of the coal mine.

Ambiguity and Incoherence: Failure is Not an Option. Neither is Anxiety.

Maths anxiety is considered to be a negative attribute, which inhibits both social functioning and school performance. It is... not usually conceived of as a disease, the connection with general states of anxiety is not well characterised in the literature. As a result, treatment consists of *ad hoc* therapies targeted at suppressing anxiety as a symptom. (Baldino & Cabral, 2008, p. 62)

In present-day societies whose structure and economic viability are seen to depend upon technological advancement, mathematics serves as prized gatekeeper to particular kinds of higher learning, these, in turn, “marketed” as routes to success, largely economic, with all of success’s accompanying privilege and legitimacy. For these very constructions, premised upon delivering certainty, I admit a personal resistance to counting among the voices speaking the urgency and import of mathematics achievement in schools. The world offers no such guarantees.

And yes, there seems already a great “to-do” written about the how, what, where, when, and why of fixing—as in both ameliorating and stabilising—mathematics education and mathematics anxiety by fixing teachers, techniques, subject matter, and governance. And still the “problems” of mathematics achievement and anxiety persist. After all, a coalmine is still a coalmine. I have nothing new to add to such accounts, and confess much desire to subtract.

Neither do I harbour any inclination to contribute to an already proliferate quagmire of a pragmatics of the superficial, too readily taken-as-(uninterrogated) commonsense. Practices of selective cross-sectional correlations attentive to symptomatic measurables have too long had a dominating influence in schooling practices. It is not that these are ill minded per se, but rather that they cannot stand alone. What is gained in breadth of view is lost in depth of perspective. Long overdue in terms of informing education is considered attention to deeper etiologies and contextualities complicit in the sedimenting of disparate incongruences—these pressing us into a crazy making that borders on the pathological. In avoiding histories—cultural, personal, and evolutionary—it seems to me, we turn a blind eye to the pouring of the tragedies of collective incoherences into individual lives and instances, like cultural “sinks” to buffer and absorb the ills of the day, even as they provide a direction and come to inhabit well their part in the blaming and the fixing gestures. I want no part of holding up the exception to any rule and announcing that if so-and-so can do it, then you should too!

And yet, I am part—inextricably bound. I acknowledge the opacities of culture and self—that, in as much as I work a swarming teeming world, so too that world, rife with ambiguity and incoherence, works me. I narrate a quest to look differently at anxiety; or perhaps not directly at anxiety, but rather beyond and through and with it in a manifold world of shifting perspectives and understandings, where self and selves are multiply conditioned, swirling in a vibrant palimpsest of co-authoring and co-authored scales of nested existence. Speculating from broader and deeper views into the situation of mathematics anxiety, we could not but meet the potentially conflicting conditioning effects of collective shared histories with personal psychodynamic adaptations of being. I

ask after mathematics anxiety as possible manifestation of seemingly irresolvable frictions, evidence of the clashing and wearing away of selves caught between incoherent stories and expectations where culture and community meet family and biological being. Philosophical musings foreground the paradoxical situatedness of human singular plural being, while developmental literature documents the biosocial workings of infant and childhood grappling with individuation and relatedness. Into this mix of the potentially incoherent and anxiety-provoking, Cartesian mind over body dualism—underpinning objectivism and its shadow relativism (see Bernstein, 1983)—continues as anachronistic cultural unconscious pressing a contortion of selves against a present moment of deepened appreciation on the complexities of mind as embodied in and by the nested systems of life. Compare:

And the Lord God commanded the man, saying, Of every tree of the garden thou mayest freely eat: But of the tree of the knowledge of good and evil, thou shalt not eat of it: for in the day that thou eatest thereof thou shalt surely die. (Genesis 2:16; King James Version)

Yours is not to question why, just invert, and multiply. (Mathematics teaching idiom for dividing by a fraction)

On the one hand there is the weighty expectation of managing oneself successfully by doing, and becoming, as per the dictated *givens* of an absent but felt omnipotent Other. On the other hand, demands to perform often occur alongside a rhetoric of ability as expectation and entitlement absent the grit of effortful practice. Incongruences press impossible exercises in mind reading across structures too rigid or too lax. Where failure is not an option, participants are called to inhabit well a phantasy

land where students are expected to succeed, and schools and teachers are to ensure success by enacting foolproof teaching technologies.

Yet the above constructions as underriding imperatives to “do well” tacitly warn participants against the risky unpredictable business of daring to question and test the boundaries (or their absence) of ruling structures—of engaging in self-determination through and as against the play of enabling constraints. Instead one should surrender to the supposedly surer success-route-du-jour as given according to the dictates of an absent knowing Other (see e.g., Ennis & McCauley, 2002, on techniques for renovating trust, that valued commodity for ensuring cooperation and/or compliance).

Indeed, in a climate of accountability—amid fears over now seen as too-heavily weighted, summative evaluations—even recourse to formative assessment as informative feedback for learning has devolved to a strange practice of surveilling and marking meaning-making according to a metronomic beat of pre-scripted, lock-step amassment of data documenting achievement, as if quantity equated to validity. All becomes about finished product. Who then would dare make his or her unfinished thinking visible? And, where thinking is denied but in the recesses of self, how can minds reach across solitudes?

It is not that assessments per se need constitute the difficulty but rather their incisive exposure of contradictions between narratives of entitlement when juxtaposed against an over-zealous policing of achievement. The solution of ensuring success, while alleviating the immediacy of a present assessment moment (of being found out, as it were) does little to address underlying issues. Instead anxiety moves elsewhere. The learner lives under strain and preoccupation of those equally anxious, an effect that

sabotages from the get-go, any move to poietic sense-making of world and self at the heart of learning that self into vibrant living.

The play of learning systems when it is anxiously watched, weighted, counted, recorded, in the minutia, with results blazened upon identities, silences any play of the sense-making serious type. Such micro-management of learning seems instrumental to an escalating counterdemand for ever-detailed grading rubrics in order to ensure proper deliverance of the coveted finished product. In such aberrations of play, articulation—as movement and voice—is forecably denied, or translated into fixed contractual negotiations that over-structure. Oddly this occurs even as demands for inquiry-based teaching insist on both movement and voice.

In a debilitating fog of incoherences, for the anxiety-ridden learner, the prospect of having to find and speak any sense-making thoughts aloud, may well approach (I imagine) the imagined terror of clinging to dignity while required to perform nude before the rapist. A deep travesty exists as the very absence of play's possibility in such petrifications of life. It installs perhaps the most painful, angst-provoking loss of all—a loss of the movement and voice to self-determine with others in world rather than stand as spectacle for all the world to make.

Even for the quick learner who accedes to higher levels of achievement, when performance and not sense-making is held to highest regard, and under the conditions of the space of sense-making suffering repeated curtailment, there remains ahead the looming possibility of inevitable reckoning—of being called out, interpellated into failure to act in knowing what one cannot know, and being refused or having limited access to making suitable nuanced sense. Pretense then becomes, for many, the only workable

solution. It is pretense enacted as façade that masks and protects retreat in the protective form of an absent presence in proxy before others and world.

Education literature and the Internet is replete with detailed descriptors, often fascinatingly contradictory, of the means and strategies for teaching such that students learn well—and mathematics is surely no exception. In technique, preoccupation of the Modern, it is as though Aristotle’s *techne*, overreaching the limits of what it had to offer, stumbled but—rather than being taken out of the game, or given to rest—was patched up and sent in with ever-specific prescriptive “plays.” All the while, a humbler but wiser *phronesis*, too seemingly unpredictable in method to render quantifiable practice—though effortfully practicing nonetheless—rarely had opportunity to get into the modern game, and instead, even now, continues to watch and learn, sometimes disconcertedly, from the sidelines.¹⁴

Technique, as algorithmic prescriptive, has been the “go to” play in managing schooling—its tangible precision lending assurance of accurate replication. As such, technique has been brought to compensate for less tangible, less measurable wisdom, self-awareness, and a struggle to deeper and broader consciousness. Technique offers the quick fix, even as it promulgates an ongoing tragedy of blindly enacting someone else’s knowing (including that oft-times denied, but dictating, unconscious, other/Other within). And so it is that technique, in its promise of quick efficiency, presses a contraction of

¹⁴ In distinguishing *techne* and *phronesis* I am intentionally steering clear of much more interesting philosophical discussions of the position of *praxis*. Bernstein (1983) relates how Gadamer draws from Aristotle’s understanding of *praxis* and *phronesis* to present that “every act of understanding involves interpretation, and all interpretation involves application” (p. 40) and then Bernstein cogently argues that, unawares, Kuhn’s *Structure of Scientific Revolutions* appeals “to a conception of rationality that has been at the core of [the] tradition of practical philosophy that Gadamer seeks to disclose and revive” (p. 41). Bernstein further presents from Habermas that “the danger for contemporary *praxis* is not *techne*, but domination” (p. 156). I agree. It is power and domination that moves to demand performance.

conceptualising space and thus exacerbates the very problems it seeks to fix or maybe cover.

In invocations to simply follow instructions—to follow the KISS principle: “Keep it simple stupid”—teaching reduces to mere instructing and learning translates to effortless doing (sometimes called “fun”) that compels learners and teachers alike in the direction of simplemindedness.¹⁵ Still, and despite, decades of concerted effort, anxieties seem not to abate, but rather effectuate their own compounding in the desperate scramble to be as certain as the other/Other, including as manifest for example, in other students proclaiming “this is easy”; other classes of students and districts purporting to excel; and other provinces and countries scoring higher on international measures like TIMSS. We study the successes of others, measure them, try to appropriate and fit them like square pegs into our round contexts, and wonder aloud why we continue to be found wanting.

In the process, “simple” technique speaks an expectation that any “I”—an “I” made in an experienced world, but strangely too, where world and self are already given—ought to adaptively cohere to that world, even absent the time allotted for such adaptation and coherence to be conceived. A question is posed—an answer expected. The clock ticks an escalating crisis, conditioned by an anticipation of near instantaneous resolution-of-ambiguity: the conceptual assembling across distances in time—both distance and time disavowed in the expectation. Ah instant gratification indeed, but for whom and at what cost? Ambiguities are thus given to be resolved between the

¹⁵ Recourse to medicate away anxiety, and any associated problems of attention and/or depression, is argueably a related and problematic phenomenon of escalating minimal selfhood: Anti-anxiety and anti-depressive medications can wash away care while re-rendering, temporarily at least, that which is encountered as “boring” into something more interesting. For example, anxiety medication is increasingly favoured as a treatment for attention deficit disorders (personal communication with specialist). Note that I am not advocating against medications but if given as the only and the favoured recourse to addressing anxiety they fall short.

experienced world that the learner perceives and a singular reality posed as unequivocal logic of a self-evident, transparent truth to which the learner must align him or herself in short-order—this, though that purported reality be none other than some consensual prior sense-making and sense made by a collective, that in turn renders alien a learner too anxious to play.

In the gesture, and the immediacy of the question is framed a demand to prove belonging. The learner, belated to the scene, is expected to, with slight of hand, time-travel to an immediately future self, to instantaneously grow her or his self differently, to be other than now. And this is necessary if that learner is to have any hope of gaining membership to an omnipotent, credentialling community “in the know.” The learner succumbs to the consequences of an unspoken but ever-working dictate and responds thus: When I cannot risk play. When I see no room for me to become part *with* a shared world (as sufficiently recognised and recognisable) then, in those contexts I shrink out of presence, even to myself. I section this moment off and adamantly claim “not me,” staking my claim to being other than what will be made of me, and doing so in myriad aversive tones:

That’s just stupid. [I don’t want your membership.]

Mathematics is for nerds.

Only geeks play computer games.

That stuff is for girls.

You are from Mars and I am from Venus.

I am a visual learner; you did not show me that.

I can’t understand a thing you’re saying.

I hate this class.

It's the teacher's fault.

It's the school's fault.

This textbook sucks.

I can't.

I won't.

Fit and sufficiency are at play as guiding principles in stories and models—yes, and coherence, like Kuhn's paradigms: When a narrative gains a particular coherence it seems "just right," not absolutely right. A sense of fitness arises in terms of available experiences in a context that is sufficiently predictive, without perplexing outliers to be explained away or otherwise contorted to fit (Juarrero, 2002, Chapter 14).

Still, I confront an apparent and troubling contradiction: As I consider the various scripts given of the disciplinary research realms and across the events of my work with Matt, I realise that no single instance, transcription, or event, leastwise on the surface, suffices for the whole story, narrative or not: Whereas each telling has a ring of incontrovertible truth, there is discord that echoes across tellings—a discord that is itself telling. Indeed, this is precisely the conditioning event of my own motivation. I struggle to address, to understand, and to bring into consciousness incoherences across instances—doing so in ways that would open rather than foreclose possibility.

Incoherence and threat of fragmentation describe the exacerbating nature of pathology, and I do mean to consider pathology transphenomanally. It is pathology that presences the defensive insistence on denial as self-preserving. I cannot point to any one or even a thread of examples to reveal or deconstruct a pathology. Indeed, that is why

pathologies are so insidious. To agentively locate a pathology I have to extricate myself from the crazy-making cacaphony long enough to pick up and follow a coherent sense braiding otherwise irresolvable ambiguities. I strive to take in all the denials and weave a whole that enfolds those denials, while revealing them compellingly. This is the work of resolving ambiguities in cogent enough ways. It is the opposite work of choosing one side or the other of an ambiguity and extricating from consideration the unchosen side. Much like the holding in mind the image of duck and rabbit in the well-know duck-rabbit illusion below, so too, fluid resolutions of ambiguity across difference, when effectuated without erasing or losing sight of the wholeness of each difference constitute, I contend one of the greater challenges and accomplishments of agentive sense-making and conscious-broadening world-making.

Figure 2. Duck-rabbit illusion



Where we cannot resolve ambiguities, we struggle to find ways to tolerate them, either flipping back and forth, compartmentalising views according to contexts, or denying that there is any ambiguity at all.

This sort of work, I believe, is essentially at play in the work of, for example, coming to knowing $\frac{1}{2}$ as representative of a variety of meanings. In the same way, I might know a situation or narrate my life through any number of coherent lenses. The

ability to bring these together affords a particular integrity of being that alleviates anxiety. To be threatened by difference is to worry over the possibility of difference tearing your world asunder and in the doing exact a traumatising fracturing of self. I understand the work of teaching to be about engaging students in the play of sense-making as finding ways of fashioning working resolutions across the ambiguities of the many and diverse ways of knowing themselves in and with world. The opposite of the calm of integrity is the pathological strain of fragmentation kept at bay, often through almost-chanted insistence on an invariant cover story.

Matt's story, to be considered here through the conflications of both Cartesian and Narcissistic anxieties in the play of mathematics, is thus strained. The habituated solution has been to compartmentalise and hold in view only limited narratives. The story in whose ebb and flow I found myself thrust, was recounted by his parents, and in reinforcing dialectic with Matt, as a tight, impermeable, cover story of coherence—this despite contradictions that disturbed. I hope, in so saying, not to be doing what I know I do; that is, pointing an accusatory finger saying “not me.” As amends I meekly offer acknowledging awareness that any gaze upon my own stories would likewise yield numerous elements to which I am so similarly blind.

In any case, in the example below, I watch and listen, struggling with contradictions that barely have time to register before they are smoothly erased out of mind—except that they are not erased: Both the fractures and their denials continue to exist, laid down in a crazy-making gesture of embodied discontinuities as barely retrievable memory. I had my own share of anxiety in such spaces. And it is anxiety, the very teacher I am learning to love, that points well.

Sonia: I actually put a lot of effort into trying to get his teacher last year to tell me in an analytical way what the issues were, what was keeping Matt from being successful.... so that I could communicate that to his tutor.... He was completely unable to answer, other than saying Matt wasn't trying hard enough. And that's pretty typical.

Warren: He said, "When you give kids several hundred problems and they're still not getting it, then they're just not going to get it. Ever!"

"Well, did you ever think about teaching it a different way?"

"There's really no reason because they're just not going to get it."

Sonia: He was an evil son of a gun. There's no doubt about it.

Warren: The guy didn't have any insight, didn't care. And the guy he had the year before was essentially the same. They were doing JUMP math¹⁶ and his pedagogy was the same.

Sonia: Yup, Matt failed Grade 8 math, but you know they just gave him a whatever it's called.... you get a "bye" in math. It was just stupid in some ways.

Warren: Yeah his [Grade 8 teacher's] assessment of Matt's math was, "Didn't get a high enough percentage to pass." That was basically it. It was all in this grade book.

He couldn't give any analysis of learning.

Sonia: And then we made Matt take the Math 9 summer preview course and still—

Warren: It was no help. Zero! No surprise. Being in math class has never actually helped.

Sonia: So far across 10 years of schooling zero is pretty much what it's been.

¹⁶ JUMP (Junior Underdeveloped Mathematics Prodigies) is a systematic approach to mathematics that leads students and teachers through a series of lessons meant to expand understanding through incremental shifts in the kinds of questions worked.

Warren: No evidence that instruction in school has helped—and certainly not in the 8th grade, not in the 9th grade, and not in the 10th grade.

Sonia: For sure.

Warren: So in a situation like last year, where you really push it—

Sonia: We just ended up pissing everybody off. I finally said, this is not satisfactory. It is not appropriate to have a teacher who has no conception about why a kid in his class is so unsuccessful. We need to do something.

Warren: It's only when we said we were pulling him out that they said, "Oh we can send him to the resource room"... like for what?... What are you going to do, just substitute a different person to do the same thing? So we said forget it and walked away. Then, he does it online and gets a 66 or something like that.... That kind of illustrated that he didn't really need a math teacher. Sonia and the tutor both worked with him hard and he did his assignments.

Sonia: Yeah, I had to make him do it in the evenings. The whole thing was instrumental and strategic, and all about getting him to pass, which was not helpful.... And he did pass, but it didn't enhance any of his mathematical understanding or reasoning. It was very stressful.

Warren: It was very stressful.

Sonia: I can't do it anymore. It's just not a good place. The math gets entangled with our relationship and we have enough stress without that. I would much rather just be the supportive mom getting him where he needs to go.

Warren: But, with you doing the math, it's different. He's not as stressed with the work.

Sonia: I think that's actually true.

Warren: He doesn't complain about going to tutoring.

Sonia: It's true, he never does.

Warren: When you ask him, and he has math homework, he does it and it's not so much a trial.

Sonia: In the past he'd get angry.

Warren: Very serious acting out kind of stuff.

Sonia: Slamming things. He doesn't do that ever now.

Why Math?

Just as shades of grey can be generated across a computer screen out of iterative bifurcations to black or white,¹⁷ subtly shifting continuities are laid in the micro-choices of walking. They arise out of the bifurcating effects of thresholds crossed or not, a synaptic junction traversed and reinforced or an impulse dissipated. And yet, particular patterns of human encounters do produce, not the smoothening of difference but rather the sharpening of a bifurcating gesture into ever-constraining probability valleys on the imaginable and the possible. In the present concern these valleys parse people into those that “can do math” and those that “can not”—those that find pleasure in losing themselves to mathematical experience and those for whom such experiences are traumatising.

This dissertation, theoretical and speculative, concerns mathematics anxiety—its apparent and disconcerting problematic prevalence. Yet, the contention I defend is that the problem does not reside in the particular challenge of mathematics per se but rather in the ways that mathematics has been socially constructed—notably in sweeping beliefs

¹⁷ Bifurcations as per silicon transistor switches set to on or off.

about its nature, the seeds already present long before Descartes but crystallised and brought to the fore during the Ages of Reason and Enlightenment—these coming, of course, to govern the way mathematics is presently given and taken up in schools.

Indeed, the anxiety arising of mathematical contexts cannot be fecundly disentangled from a persistent metaphor of the nature of knowledge and knowing as at once given, “pluck-able” out of a discoverable, reality-made, *empirically-accessible*, world and at the same time also given, “pluck-able,” out of a mind-made, *rationaly-generable*, transcendence. Neither one of these extremes leaves room for a crucial transitional construing space of play, between the given and the made, for grappling with knowing, mathematics or otherwise, into felt being. The humanities seem to have fared better in this. Or perhaps in Descartes’ bracketing away of the humanities as route to truth, they were spared that fiction of neutral self-evidence.

In any case, a continued belief in the discoverable objectivity of the sciences primes algorithmic approaches to teaching and learning. In mathematics, beginning with the perhaps aptly named “mad minute,” a question serves as signifier, expected to call up its signified either as singular answer or through sequence of cascading steps: Signifier to signified-become-signifier that in a domino-like tumbling of oughts leads inevitably to the One right, as always-already, conclusion. In the spaces of such a trajectory there is no room for personal sense-making, no room for contention, and no room for play.

In the discipline of mathematics and its cousins one can indeed make a case for the most ruthlessly unforgiving marker of all. In mathematics, early pretense eventually succumbs to later judgement: Mathematics is that discipline to serve up questions that regularly cut through pretense of able and knowing. One cannot typically fake one’s way

to specific right answers in rigorous and detailed mathematically given contexts; nor is it the case, especially in higher grades, that one can pull mathematical sense-making or even a fitting-enough way to proceed out of the stock of culturally circulating givens. Mathematics is that discipline to seemingly wield strange inaccessible alchemy, readily exposing the would-be imposter.

I don't believe this particular way of understanding has and have nots in mathematics is necessary. Rather I consider it possible to interrupt the inertial movement of a still-proliferating fiction of knowledge's out-of-body existence. Entailed in the paradigmatically different view to a Cartesian predecessor is this: An understanding that knowing cannot but exist in being through the doing of selves. Knowledge is not out there. Just as the sun appears to rise and set, it only seems that way when our view is from part to comprising whole. Indeed knowing can only exist in the patterns enabled by the structural entailments of life. And it is doing that continual shapes and reshapes those patterns into being. It is the doing, and the enabling constraint of the shapes thus made, that give rise to the characteristic experiences of knowing and knowledge. I consider these seeming extremes as simultaneities, rhizomatically connected in common response to that Cartesian agreement—a bifurcating one vigorously at work in schools and rendered iconic in ever-circulating Euclidean forms of right, normal, straight, and standard representing the rational as pure and somehow better because it rises above, beyond, and outside base bodily being. “Can do” and “can not do” in mathematics condition a falling to either side of a no longer tenable Cartesian watershed—the first flowing confidently in the direction of clear certain objectivity, the second mystified,

suspicious, and relegating itself for the time being to out of sight places free from threat of being “called out” as lacking.

All of this prompts me to wonder at the naming of the present era in such terms as entitlement, distrust, and malaise. Perhaps our anxieties—mathematical, Narcissistic, and Cartesian—are symptomatic of lives lived in a hopeful hinterland between shifting and conflicting paradigms from a no-longer-tenable Cartesian narrative of certainty to an as-yet-to-be-coherent-enough post. Oh so difficult, to let go of the promise of certainty! Indeed, anxiety emerges in effortful refusals to the existence of insisting perceptions and the cresting impossibility of holding tensions across incoherences. It is an experience reminiscent of childhood, where a haunting apparition refuses to disappear even though it fails admission into the contradicting realities of others and the world. Anxiety expresses a taut condition of self-bracing in preemptive apprehension of shearing forces threatening one’s very viability. And it enlists awareness and will to that primal task, consuming energies and obliterating the view to alternative paths of adaptive self-change and learning. If crisis is the doom one avoids, anxiety announces already crisis’s slow simmering existence—the yet refused presence in consciousness.

Just as an uncanny unconsciousness works an absent presence in individual being—doing so at odds with a consciousness that, willing orderliness, denies audience to such unruliness—so too might we think of the world in these terms. Indeed, reaching the limits of what dominion can do, the world of humans finds itself humbled at the authority of an ever-present something at work called the natural in its various humanly understood configurations as wise, pure, red (with tooth and claw), harmonious, innocent, and complex (Coyle & Fairweather, 2005). Try as we might, we cannot control a primacy of

the natural that refuses submission and instead subverts the Cartesian project of mind “above” all things bodily. Yet still clinging to a fictive construct of omnipotent knowing, in mind, we dare not risk relax a managing and controlling hold on what can be allowed presence, until of course there remains nothing left to hold.

Current anxieties, I contend, reflect a long overdue dwindling of trust in a notion of power of will over body, mind over matter, that necessarily accepts the Kantian and Cartesian presupposition of pure mind as separate and more nobler ruler of all things base, bodily, and material. Perhaps we could name these times in terms of a tsunamic disillusionment imposed of the physical—ecologies individual and collective that, pressed to their limits, do issue “base bodily” resistances, now too cacophonous to ignore. Too, the present era tells of exhaustion of resources, for some, giving over to despair as that dissolution of self, after anxiety, into the flow and whim of what will come. In minimal zombie selves, loss of care (where care etymologically refers to worry) promises a reprieve from no-longer-tenable anxiety. It is the living death of retreat. In some sense minimal selfhood enacts an admission of defeat but defeat in that Cartesian-contrived, arbitrary war of mind over body. A solution of foregoing one’s agency to any higher authority is a solution that abdicates responsibility in exchange for sublime freedom-from-care. And yet, and still, the deal cannot be closed except through death as that annihilation of bodies who—conditioned across, through, and out of millenniums—insist on life.

Might it be useful to think of the present as a post-traumatic cultural moment whereby a dissociated unconscious past—still yearning for and even expecting the promised certainty of Western will and power—anachronistically insists itself unto the

present, wreaking contradictory havoc there? Judith Butler, drawing from Adorno, considers what happens when a once-collective ethos ceases to hold sway:

Precisely because the collective ethos... is not commonly shared... it can impose its claim to commonality only through violent means. In this sense, the collective ethos instrumentalises violence to maintain the appearance of its collectivity.

Moreover, this ethos becomes violence only once it has become an anachronism... [A]lthough the collective ethos has become anachronistic, it has not become past... and violence is the way in which it imposes itself upon the present... to eclipse the present. (2005, pp. 4–5)

To what degree are present emphases on the quantifiable and the manageable in schools—monitored through various governing mechanisms and policies—evidences of anachronistic Cartesian violences? And if so, what are we to do about it?

Moreover, how might the difficulty conceived of mathematics constitute one very visible node of a pervasive cultural dis-ease—a pathology of irresolvable yet untenable incoherences—where mathematics anxiety expresses exacerbated narcissistic anxiety (see Lasch's *The Minimal Self: Psychic Survival in Troubled Times*, 1984 but sadly still relevant) and collective Cartesian anxiety (see Bernstein, 1983)—both conditioned in a cultural malaise of Cartesian insistences on the rational ordering of the organic and organic refusals on the part of life systems, human and ecological?

In the present day, sensibilities do shift—but not of-a-piece. Fragmentation and incoherence have become characterising subtexts of the times. They condition the ethos of a present epoch riddled in anxiety on the wings of change. The world teaches. Increasingly unable to extricate ourselves from its lessons, we confront the self-evidence

of embodied cognition and our deep embeddedness in and as systems—where knowing entails in forms and their relationality. We have been shifting, learning ourselves into a difference, adapting to the sometimes-violent confrontations of non-dualism’s play. We do move—though not everywhere at once and surely not in any orderly fashion—now with the tension in a manner away from the taut controlling mechanistic gestures of yesteryear. The romantic in me envisions relaxing into an alternative that I want to call tenderness—a holding too, but holding in the sense of outward extensions of self that allow for the other, trusting enough in the embodied processes of life to work their wisdom possibilities.

Of a Primal Paradox

And so, though I draw from the richness of a tale about a two-year journey through high school mathematics with one learner, the world is represented in that tale, making this dissertation about much more than one learner’s journey with me. Having encountered a learner troubled and exacerbated in mathematics, I work to ultimately arrive at a consideration of mathematics (in Chap. 6) as ensconced in, and whose strangeness emerges of, an original Cartesian dualistic fantasy. And I further consider that Cartesian fantasy as most prevalent but insidious amplifier of a prior and persistent human difficulty: narcissistic anxiety. Indeed, as I develop, the three anxieties are alive, well, and mutually reinforcing. The Cartesian construal of an attainable ideal reminds us of sins, ours, original and otherwise. Pretentious, narcissistic grandiosity, wedded to Cartesian puritan ideals, enacts a defensive denial of that which is base, bodily, and human—yet the project must be doomed from the start. In the judging encounter with a formidable, omnipotent, construing force of mathematics one faces admission into the

category of “can do” or “cannot.” Put differently, here is a narrative that at bottom is about the negotiation of self-becoming as self-creating in the unavoidable paradox of singular plural being—a paradox for which the solution of a Cartesian reality is no longer so tenable as it once was. The story’s narration began at the illustrative instance of a breaking point, in Matt, and the crack in a façade of well-being. Yet, it could have begun with any unity, any such life, for as we shall see, life systems are nested collectivities, at once, comprising and composing life systems all the way up and down. As such, like the world in a grain of sand, each life speaks to, of, and with the whole.

The grander problem, beyond mathematics, addressed across subsequent pages is precisely the shutting out of a self from a discipline because that self could neither see himself in the discipline and could not allow himself to risk play. The shutting out was preemptive from the start. It was given for lack of entry because the entry was assumed as always and everywhere visible and discoverable to anyone who was willing to do the right thing; that is, to take it upon themselves to properly look. The story is an illustrative one, an exemplar serving as way into and of a larger problem of worth and value and selfhood, where ontology meets epistemology—where the who that one is turns on access and participation, through knowing, with a larger who. It is ultimately a story of organic being, as ongoing becoming—the co-enacted doing of selves, singular and collective, into knowing. I turn, thus, in Chapter 3 to position the story in broader philosophical considerations of singularity and plurality, the many and the one, where Maturana and Varela’s embodied biological systems play into Nancy’s paradoxical human condition of singular plural being and the problem of agency that figures central in Judith Butler’s theorising on something she calls performativity.

3 Agency, Autonomy, and Learning when Mind is Body

Jean-Luc Nancy designates a paradoxical challenge of singular plural being: “Existence *is with*: otherwise nothing exists.... The distinctive characteristic of the concept of creation is not that it posits a creator, but that, on the contrary, it renders the ‘creator’ indistinct from its ‘creation’ ” (1996/2000, pp. 4 & 15). Who is this “I” that I dare narrate myself as being, who claims to create of herself that which she wills, and yet who can never be solely unto herself? Judith Butler writes, “When the ‘I’ seeks to give an account of itself, it can start with itself, but it will find that this self is already implicated in a social temporality that exceeds its own capacities for narration” (2005, p. 8).

Consider the word “individual,” colloquially intending a person (from 1742) but originally an undivided trinity (early 15c.). Etymologically, “individual” harkens to the Latin *videre* from Proto-Indo-European roots *weidh* and *wi* and an original sense of “with” as “against” and indicating “separation”—an “and,” but one marking juxtaposition and adjoined difference (Harper, 2012). Jean-Luc Nancy’s philosophy of “self” posits an ontology of the self in terms of this “with,” encapsulating that idea in his expression: “singular plural being.” Nancy takes Heidegger’s “with” and develops it as “the fullest measure of (the) incommensurable meaning (of Being)” (1996/2000, p. 83).

To these formulations of Nancy’s, I pose questions of agency, as shaped first according to Butler’s conceiving, and then reconsidered against Maturana and Varela’s understanding of life as autopoietic (1987)—where autopoietic systems are structure-determined, *physically* autonomous systems engaged in their own recursive “self-

creation.”¹⁸ It cannot be overemphasised that the physicality of an autopoietic system, as shall be developed, is that which, by definition, enables it to be a system that learns—in short, to be alive. As soon as we accept a non-dualistic, post-Cartesian ontology that understands mind and body as one and the same, then cognition is that which is embodied and *autopoietic systems, learning systems, and life systems become synonymous*. It is in autopoiesis that we come face to face with the paradox of singular plural being that Nancy posits and the questions of agency and autonomy to which Butler speaks. *If mind and body are not separate then how can we resolve a physicality of body as bounded singular being with a human condition of mind in singular-plural becoming?* The present chapter frames a context to answer this question, whereas Chapters 4 and 5 detail the human processes for sense-making in a *with* of world.

Importantly then, though the discourse to follow—being principally about autonomy, agency, and autopoiesis—may at first bluff seem far removed from the story of Matt in mathematics, I assure you it is not. In its simplest expression this chapter interrogates the fundamentals of learning. These fundamentals underpin and are necessary to the way I approach Matt’s experience with mathematics. They underscore questions that go to the heart of his anxiety as an issue of *being* and of *being well* with and in world.

When mind and body are no longer separate, then sense-making becomes self-making, but who is the self that thus makes sense? Moreover, the sense that one makes ultimately makes sense on the grounds of some sustainably viable, perceived fit with the world. In knowing and awareness, self and world entangle and the porous boundaries

¹⁸Recursive self-creation names an infinite loop of self-cause—of life creating itself where each act of doing, at some level both enacts the self and changes the self that thus acts. It is in this sense that we can say that knowing is doing is being, the action of which entails ongoing becoming, and the becoming that thus entails is always entailed in and of a with of larger and smaller collectivity.

between self and world blur, calling into question as they do any trivial notion of autonomous agency. *What does mathematics become, and the sense made of oneself in mathematics, when misfitted incoherences abound between and within oneself as agentive, supposedly autonomous being and a world that at once constructs the self and yet seems to insist on having taken no part in that construction?*

I am ultimately concerned with agency in this chapter—its possibility and its relationship to autonomy in learning as autopoietic. I wonder about Matt, who seems not to own his own possibility, indeed, who has learned to absent himself from particular forms of ownership and who, failing to make sense of contradictory narratives that swirl about him, participates in a kind of belonging and worth in the only way he can: by accepting and reiterating the very incoherence of pathologies that construct and condition him anxious in the first place.

Contexts for Thinking Selves and Making Sense

Thinking human autopoietic agency in the contexts of the socio-cultural, historical, and evolutionary occasioning of our collective being, one confronts a paradox: How can we justifiably speak of authoring ourselves autonomously, though many do thus speak, when we neither belong wholly to, nor are wholly instantiated by, our individual selves? The properties conditioning our individual selfhood preexist and presuppose us into continued being where, as Judith Butler puts it, the “I” that speaks “is already implicated in a social temporality that exceeds its own capacities for narration” (2005, p. 8). To understand life as recursive is to press an unanswerable question of beginnings, where self-authors emerge into selfhood and identity, iteratively, through procreative reproductions of, and from, a world that authored and authors them. To what degree can

we think the newly formed zygote, the neonate, the toddler, the teen, the adult, or the aging person possessing of an agency from, of, and on behalf of an autonomous acting self?

Situated within particular cultures, each with unfolding affordances on the particularities of expression of a likewise co-evolving social species, humans live out unique trajectories of becoming with varying degrees of awareness on co-self-instantiation. Existing as at once parts composing wholes and wholes composed of parts, to what degree can we fairly imagine ourselves to be autonomously enacting agentive choices—in Rorty’s words, of being “strong poets”¹⁹ (1989)—presumably to the end of our own vibrant well-being? The dynamic that is life always presses becoming, some kind of becoming, either in the direction of resilience or in the direction of stasis. However, stasis, as an absence of movement, effectuates a crystallisation toward rigor mortis, that signals we are “done for.”

Accordingly, we might think wellness in terms of the maintenance of ongoing viability of a self dynamically holding its distinctiveness (lest it dissolve into world) but also fluidly conversing with the world (lest it find itself ill-fitted and erased into exclusion). Vitality names an aptitude for adaptive becoming, negotiated between our bodily selves and the ecologies within which we exist and which exist in and as us. Notably the bodily experience of self also entails that experience in and as mind; and, existence as mind-body ultimately comes into ownmost selfhood through recursive,

¹⁹ To fail as a poet, Rorty writes, “is to accept somebody else’s description of oneself, to execute a previously prepared program, to write, elegant variations on previously written poems” (1989, pp. 27–28). Rorty refers to an “unconscious need everyone has: the need to come to terms with the blind impress which chance had given [us], to make a self for [ourselves] by redescribing that impress in terms which are, if only marginally, [our] own” (p. 43).

language, phenomenological engagements with and in world. We are ever becoming other than we were—orchestrating biologically shifting self-worlds—in the “with” of a likewise moving world that we indeed participate in moving. Is it the case that wellness as vitality at the level of the cultural and societal collective can coexist with wellness as vitality of all participant individuals? With the sheer increase of numbers of humans on the planet, can the center hold or might the fracturing and felt frictions of incoherences forming across new fault lines prove inevitable?

The humanness and humanity of our sociality exists in a difficult-to-conceptualise-and-inhabit tension of negotiations of autopoietic being, co-occurring at nested levels of *with*, individual and collective, across time and space. Life-creating and life-created contexts are inevitably singular and plural and this cannot but call into question any autonomy that would live outside the paradox of a “with” of being. Moreover, the crosscurrents and eddies of paradoxical being and becoming, especially when unconsciously felt but consciously denied, set up conditions of anxiety. One can thus imagine anxiety as the felt manifestation of incoherences that, at some level of experience, tug at us and threaten our sense of self-continuity. Furthermore, where circumstances render such incoherences inaccessible or inadmissible to consciousness we may have little recourse but to a kind of effortful life dedicated to holding at bay, in whatever means contrivable (and in this we are genius), an ever-pressing angst-provoking tension of fracture’s impending possibility.

At the level of the individual, the strapping together of simultaneous incoherences asks a neurological, conceptual, and perceptual feat of resolution of ambiguity that I take to define the possibility of sense-making and a potential easing of anxiety. Notably, the

particular senses already made and given by the collective do point us, preemptively, in that undertaking.

It is our biological habit to make coherence (as meaning) of our sensing experiences, personal and collective. Where mind is body, physiological coherence-making, especially as affectively linked,²⁰ is a kind of meaning-making far exceeding conscious activity. I am here noting that the very lived experience of sensing is neurologically encountered through a lens of meaning accrued according to the minds' biological predisposition to self-organise with co-occurring sensory input (see neural *reentry*²¹ in Edelman, 2004, 2006). In this manner we weave sense through micro and macro “a-ha” moments (consciously felt or not) of neural resolutions of ambiguity (aptly contextualised as “huh?” moments)—a strapping together of experiences in and of time and space.

Indeed, the human, at levels individual and collective is sense-weaver extraordinaire, where the creative construals said to “make sense” do so according to humanly-perceived workable ends. Still we are limited by the near and far horizons forward and backward in time, to which and from which we can bring our own conceiving into conscious present awareness. As a species of powerful construers, we rely on the making of analogical meaning according to metaphors taken of primal bodily experiences (Lakoff & Johnson, 1999), especially as nuanced according to and out of first child-caregiver interactions (Fonagy & Target, 2007). We might even say that the

²⁰ This affective link to meaning will be elaborated upon in Chapter 4. At a simplistic rendering it involves primarily the limbic system and variously triggered neurochemical reactions and feedback loops.

²¹ Reentry is the continual signaling between brain regions across “massively parallel fibers (axons)... [in] anatomical arrangements [that] include a dense meshwork of reciprocal connectivity” (Edelman, 2006, pp. 28–29). These reciprocal reentrant signals constantly change with the speed of thought (p. 28), “as they carry action potentials and modify synaptic strengths, [to] integrate and synchronise [outside consciousness] the different activities of various specific brain areas” (p. 29).

humanities and the sciences—both world-making according to particular hermeneutics of interpretation—are highly evolved cultural sense-weavers of the story-telling and model-creating kind.

On the one hand, it seems our human habit to artfully thread sound coherences across time—these given and made in the recursive telling of stories—is that habit to pattern truth out of truth: Where stories that “ring true” are those that hold together and afford meaning in as much as they resonate with our own tangibly felt histories of experience, these made tenable within the cultural stories of our time.

On the other hand, it also seems our human habit to artfully thread visual coherences across space—these given and made in the recursive creating of models—is that habit to pattern truth out of truth: Where models that “ring true” are those that hold together and afford meaning in as much as they resonate with our own tangibly felt histories of experience as made tenable within the cultural models of our time.

The stories and models across time and space that validate who we know ourselves and the world to be are those that feel right, that comfort us with the familiarity of our own lived experience. They do so precisely because they accord with those accounts to which we have already acceded admission and through which we have been acceded admission into counting. And these take forceful emotive insistence—however accessible and admissible to conscious being—out of primal deeply embodied adaptations to early experiences in life.

In a Hegelian dialectic of individual sense-making, heuristic “a-ha” moments of synthesis mark a bringing together of that which was incoherent into creative co-perception with the coherent known of self in a way that conceptually and

physiologically makes possible the resolution of ambiguity. At the level of the collective, the stream of culturally-available stories and models can serve to prompt particular resolutions of incoherence to make a livable, situated sense of the world from this or that skewed perspective. In such instances, that which is left inadmissible to perception lives in culturally dissociated places.²²

At the level of the individual, the sense one makes of oneself and that moves emotive enactments of self, and of other through self, is largely opaque to conscious knowing. In the recesses of mind, reside early, formative adaptations, become first and most-resistant sedimentations (Juarrero, 2002). Out of unresolved pre-discursive “conclusions” drawn of a world of one’s adaptive infant construing, afflicting incoherences play us and are subsequently played upon us, in and by world (Lachmann, 2008). Inasmuch as emergent capacities and conditions limit the sense-making of resistant and troubling personal incoherences, and especially where we feel alone in those experiences—that is, they are not buoyed along by reinforcing culturally dissociative moments, smaller enclaves in which to belong—then the singular of being may find itself caught in a conflicting clash of variously expressed, dissociating plurals.²³ In such conditions, incoherences, relegated to unconscious life, find affective expression in

²² Donnel Stern describes such dissociations as dissociations in the weak sense (2003, p. 140).

²³ Dissociation is described by Donnel Stern, citing Daniel Stern, as “an unconscious unwillingness to experience certain states of being simultaneously.... [and] as the inability or unconscious unwillingness to articulate certain aspects of one’s experience in verbal language” (2003, p. 64). Donnel Stern sees these two meanings as making the same point: “To refuse unconsciously to enter a certain state of being is (among other things) to refuse unconsciously to create the particular explicit meanings that would be available from within that state” (pp. 63-64). Though dissociation in the largest sense is not fully a failure of either thought, memory, or feeling, it brings these failures into play by consequence. With a crucial connection to Winnicott, Donnel Stern writes, “Dissociation is a failure to allow one’s imagination free play. In many instances one can think of the failure of imagination as the collapse of transitional space (Winnicott, 1971) into deadness or literalness” (2003, p. 64). In contrast, the absence of dissociation is, according to Stern, and following Winnicott, is a “(relatively) unfettered curiosity, a point that immediately allows us to say that experience ranges from highly imagined to highly dissociated, with all the implied variations in between” (p. 65).

diffusely felt anxiety and, for some, press retreat into solitary minimalist being. Such an anxious retreating self spirals into pathology inasmuch as it weaves a tightly knit, near-impermeable presentation of false coherence. Thus a dis-ease of untenable singular-plurality could be thought to inhere in the very insidiousness of incoherences, anxiously and effortfully avoided.

Singular Plural Being

There is no ‘meaning’ except by virtue of a ‘self,’ of some form or another.... But there is no ‘self’ except by virtue of a ‘with,’ which, in fact structures it. This would have to be the axiom of any analytic that is to be called coexistential.... [P]rior to ‘me’ and ‘you,’ the ‘self’ is like a ‘we’ that is neither a collective subject nor “intersubjectivity,” but rather the immediate mediation of Being in “(it)self,” the plural fold of the origin. (Nancy, 2000, p. 94)

Nancy claims that “what is known as ‘society,’ ... in the broadest and most diffuse sense of the word, is the figure of an ontology yet to be put into play” (p. 34). He traces an historical trajectory in understanding social being: from Rousseau’s contract, to Nietzsche descriptions of human society as “an experiment... a long search... and *not* a ‘contract’” (Nietzsche in Nancy, p. 34), then Marx’s qualification of “humanity as social in its very origin” (p. 34), and notably Heidegger’s designation of society wherein Heidegger posits “being-with as constitutive of being-there” (p. 34). Nancy proposes what he claims no one has done before: a radical thematisation of the “‘with’ as the essential trait of Being and as its proper plural singular coessence” (p. 34). He writes:

What is at stake is no longer thinking:

—beginning from the one, or from the other,

—beginning from their togetherness, understood now as the One, now as the Other,

—but thinking, absolutely and without reserve, beginning from the “with,” *as the proper essence of one whose Being is nothing other than with-one-another* [l’un-avec-l’autre]. (Nancy, 1996/2000, p. 34)

He advocates against an “ontology of the Other and the Same” (p. 53) and cultivates “an ontology of being-with-one-another... [an] ontology [that] must support both the sphere of ‘nature’ and [the] sphere of ‘history,’ as well as both the ‘human’ and the ‘nonhuman’; it must be an ontology for the world, for everyone” (p. 53). Consistent with the problem and approach that I take to anxiety here, for Nancy too, “the question of Being and the meaning of Being has become the question of being-with and of being-together (as cited in the sense of the world). This is what is signified by modern anxiety” (1996/2000, p. 35).

We exist as the anxiety of “social Being” as such, where “sociality” and “society” are concepts plainly inadequate to its essence. This is why “social Being” becomes, in a way that is at first infinitely poor and problematic, “being-in-common,” “being-many,” “being-with-one-another,” exposing the “with” as the category that still has no status or use, but *from which we receive everything that makes us think and everything that gives “us” to thinking* [emphasis added].

(Nancy, 1996/2000, pp. 42–43)

“Witness” then, as Nancy details it, is constitutive of being and, at once, constitutive of a paradoxical challenge: the as-yet-to-be-satisfactorily-resolved-ambiguity of living well our human plural-singularity. He positions existential anxiety—manifest

variously, I would add, in Cartesian, Narcissistic, and mathematical anxieties—in terms, first, of a failed dialectic that Marx thought he foresaw, where “‘individual’ appropriation... would mediate within itself the moments of private property and collective property” (p. 53) and then as seemingly confirmed in Freud’s “contrast between a possible cure of the nervous individual and the incurable malaise of a civilisation. This dialectic, this contrast, and their uncommunicative and paralysing confrontation indicate the knot of questions, expectations, and anxieties of an epoch” (p. 53).

Notably, the paradox of selfhood constitutes the conditioning subtext of autopoiesis that Maturana and Varela (1980, 1988) develop and that Thompson (2007) later expands in *Mind in Life* (2007). Singular plural being is always already both the challenge and the possibility of each biological self’s self-authoring. The self who authors—in degrees of autonomy unknown and indiscernible to that self or other—is a self already construed with and of others, a self embedded in and permeated by a self-construing and self-construed world.

Inasmuch as Nancy’s account of singular plurality radically thematises this “‘with’ as the essential trait of Being...—its proper plural singular coessence” (1996/2000, p. 34), the paradox instates a fundamental irresolvable ambiguity as discontinuity. Much in the manner that one comes to know a mathematical limit, the discontinuity—though conditioning a tension impossible to fully inhabit at its middle—can, I contend, be helpfully approached from either side: from the singular into the plural and from the plural onto the singular. In so saying, I notice and frame the two principal discourses that influenced my encounter with Nancy’s singular plurality in the first place:

Maturana and Varela's autopoietic accent on the singular and Butler's notion of performativity as accentuating the powerful conditioning forces of the plural.

On the one hand, in autopoiesis the singular being's task of recursive self-creation is (as we shall see) developed into and according to plural conditions of collectivity, where collectives coalesce into unities that themselves nest into and compose larger unities. On the other hand, Butler theorises from the assumptive force of language—instrument of the plural—that interpellates each singular being with repeated constructing force. Put otherwise, while Maturana and Varela build their conceiving from the bottom up, from first cellular life forms up to collective being, in performativity and its subversive interruption, Butler's attention seems more concerned with the top down socio-cultural construing habits that call us into particular possibilities in the first place.

Performativity and Agency

It was Butler's theorising that rendered most poignant, for me, the questions about agency and autonomy that I ultimately put to psychoanalytic theory, childhood development, and teaching and learning; but, it has been my affinity to biology, and Maturana and Varela's theories of autopoietic human becoming, especially when framed in the "with" of familial relations, that move me to rethink agency's deepest possibility.

I am not the first to wonder about agency in the performative terms set forth by Butler. In performativity, language is that a priori constructing instrument to interpellate us into subjective being. Performativity thus is thought to threaten any real possibility of an autonomous agent acting for itself: "Philosophers, feminists, sociologists and theorists of gender, sex and identity... continue to worry over the meaning of 'performativity,' whether it enables or forecloses agency" (Salih, 2002, p. 59). Indeed, it was for reasons of

Butler's influence that I found myself troubling over assumptions of autonomy and agency in terms of a learning subject. Accordingly, it seems wise to foreground upcoming discussions of autopoiesis with the ruminations provoked in me by my reading of Butler.

In *Gender Trouble* (1990 and 1999), Butler develops the performative role of language in, for example, the interpellation into girlhood of the birth announcement, "it's a girl," whose collective utterance reiterates and constrains anew the terms of the possible. In *The Psychic Life of Power* (1997) and *Undoing Gender* (2004) she gives a more fulsome address to the challenge of agency despite the performative call into subject formation that she first detailed in *Gender Trouble* (1990).

I locate three developments of agency in Butler: A first surfaces in the 1990 edition of *Gender Trouble* in the form of parody and subversive performative acts and is then elaborated across: *Bodies That Matter* (1993), in the 1999 introduction to *Gender Trouble*, and subsequently in *Undoing Gender* (2004). A second consideration emerges in *The Psychic Life of Power's* (1997) analyses of the transitivity of power as reappropriated by the subject that it enacts into being. And finally in *Giving an Account of Oneself*, Butler considers the modes of agentive self-making in relation to ethical responsibility and "the difficulty of being formed as a reflexive subject within a given social world" (2005, p. 134).

For Butler, the subject, as linguistic category, is the place-holding structure in formation that emerges as a site only through its simultaneous occupation by an individual. Both subject and individual "enjoy intelligibility only to the extent that they are, as it were, first established in language" (1997, p. 11). Yet, rather than discounting

the body or claiming that it is reducible to language, Butler foregrounds the body's unintelligibility outside language and acknowledges "the permanent difficulty of determining where the biological, the psychic, the discursive, the social begin and end" (2004, p. 185). The act of "girling" (or, transposed to this dissertation's concern, of naming someone able in terms of numeracy) performatively reinstalls a foundationalist notion of girl (or the mathematically able as endowed potential) into continued existence even as it renders a particular quality of an individual's existence possible through that very presupposed ideal. Put differently, naming defines and then endorses a particular mode of being. Moreover, to construct this ideal human is, at the same time, to construct its outside: the inhuman, the less-than-human, the humanly unthinkable, and various other versions of abject "otherhood." In short, to construct what *can be* permissibly present is to also demarcate the boundaries of what *cannot*.

Taking this theorising into lived negotiations of selves in mathematics: In the echo of a parent's voice saying, "It's okay, I was never good at mathematics either" do we witness, in effect, parent collusion in supportive solidarity with child, resisting the terms of ideal construction? Is not the collusion also an invitation to the anxious child to participate in a contradictory fiction that denies what seems expressed everywhere in schools: that knowing mathematics matters? To what degree is this constructed absence-of-care a viable solution to an otherwise irresolvable, anxiety-provoking incoherence of ones' worthiness and deserving nature on the one hand, and one's devaluation and exclusion from the ranks of the deserving who are "born mathematical" on the other?

According to Butler, whether constituted directly or indirectly, the materiality of the world, the body, and any prediscursive entity remains unrealised and without

ontological status except through interpretive, normative, and performative installation and subsequent iterative maintenance, always in discourse—a discourse, itself, governed by the “prevailing matrix of ethical norms and conflicting moral frameworks” (2005, p. 7). Can we dislodge the constructing force of mathematics in schools or do we strive to create all children mathematical and therefore deserving to belong? Should we? How can one subvert the performative force of being set in terms of the quality, mathematical or not? Or, for those who find themselves unsatisfactorily innumerate, is there little recourse but to submit to a countergesture, always accorded by the mathematical construction, of non-mathematical as desirably “non-geek?” Would it be instead possible and desirable to grow oneself able in, with, and through the anxiety of mathematics?

Butler pauses to caution against substituting one foundational subject for another. To say that discourse, power, or a matrix construct the subject is to posit a reversal of terms that reduces constructivism to determinism and, in the doing, forecloses agency. She prompts us not to think of the matrix as causally inducing the subject, but rather to ask after the “conditions of its [the subject’s] emergence and operation” (1993a, p. 7). Insisting “there is no power that acts, but only a reiterated acting that is power in its persistence and instability” (1993a, p. 9), she strategically maneuvers to keep open the possibility for subversive acts. What would be the equivalent subversive act to somehow undermine the very posing of the question of one’s mathematical ability?

Taking Butler’s theorising to another level, could we usefully parlay her notion of performativity into the biological? Genetic imperatives iteratively act to enable and constrain a realm of ongoing possibility. Gene expression is subject to epigenetic conditioning; that is, particular ecologies are able to interrupt and even subvert the

structuring processes of such structures (see Jablonka & Lamb, 2005, *Evolution in Four Dimensions*). Would it be too audacious a stretch to consider that Butler describes a phenomenon usefully applicable at the level of our biological construction—one that might help us look differently at so-called mathematics ability?

Just as Butler considers the matrix of gender relations “prior to the emergence of the ‘human’” (1993, p. 7) so too is a matrix of genetic scripting prior to the existence of each subsequent expression of humanness. Butler construes gendering as “the matrix through which all willing first becomes possible, its enabling cultural [and I would add, individually situated] condition” (p. 7). Likewise, but at a different level, we might construe genetic structuring as “the matrix through which all [life’s] willing first becomes possible, its enabling... [species and individually situated] condition” (p. 7). Yet, neither subscribing to volunteerism nor determinism, our recursive autopoietic natures up and down are creative within the terms of these a priori constraints—set historically in both cultural and evolutionary terms.

In *Psychic Life of Power*, Butler elaborates the interplay of power and person by describing an irresolvable ambiguity: The power that enacts the prediscursive subject into being becomes the very power subsequently enacted and wielded by the subject. In grand generality, is this not like saying that lives are themselves endowed with living vitality when they claim for their own the very terms of what human living is given to entail? At the same time, constructed *in* mathematics and “owning” it, may well be the only route to enacting and wielding a power it alone is given to afford. Thus, the subversively creative potential of life itself and the power acceded in owning and wielding one’s own mathematical prowess (even, and perhaps especially, to dislodge that strange privilege),

may well be the most promising sites of agency for the anxious mathematics learner. Tethering this theorising to the situated context of Matt suggests that his coming into himself through mathematics may entail, one part, a reclaiming of the very creative potential of life itself, and, another part, a realisation of his own power in conquering and owning all that he experiences as anxious in mathematics. As Butler suggests, subjection enables mastery; and agency—emerging as that excess power by which mastery is enabled—becomes “the assumption of a purpose *unintended* by power” (Butler, 1997, p. 15).

Crucially, according to Butler, though emerging as an emission of and from the body, language falters in its writing on that body, such that “the body carries its own signs, its own signifiers, in ways that remain largely unconscious” (2004, p. 198). Put differently, though cultural meanings, following Foucault, may well be imprinted on—rather than internalised into—the body, the interpellation that calls a body into femaleness (or mathematically able) acts to construct and register that very body as female (or mathematical). Thus, the “girling” (or “mathematising”) of a subject, for example, inscribes on and through a particular body certain materially transcribed gestures that signify “femaleness” (or “mathiness”) and this is accomplished whether or not the individual thus constructed is first conscious of such inscription and subsequent resignification.

Notably, in the installation and subsequent performative reenactments meant to iteratively maintain such installation, there is an inevitable idiosyncrasy of enactment that can only be dispensed in a specific way on a particular body at a given instance in time. The recurrence of a term of gender (or mathematical ability) “does not index a sameness,

but rather the way in which the social articulation of the term depends upon its repetition.... [*Such*] terms... are thus never settled once and for all but are constantly in the process of being remade [emphasis added]" (Butler, 2004, p. 10).

When we speak we enact beyond the utterance of sounds and beyond ourselves. In speech, we act upon others and convey meanings—citations of past performative acts—of which we are not consciously privy. Language is that cultural vehicle that, working through us, is of us and not of us. "In this sense... the significations of the body exceed the intentions of the subject" (2004, p. 199). Butler posits a space for agency—though not in a voluntarist sense, but in the inevitable and myriad variations of performative acts as well as the unique interpretive means of heeding interpellative calls that are themselves the force of language writing itself on the materiality of bodies. Language must stumble in its writing on the body and in the stumbling spaces, subversion becomes possible.

Yet, one might also muse how, in a strange sort of unanticipated interpretation, the language of DNA's genetic speech, owing to epigenetic conditions, does also stumble in its writing of bodies. In any case, it strikes me that it is in the stumbling spaces where subversive difference becomes possible. As such, the meeting of language and genetics seems rife with emergent possibilities of infinite variation.

The self, construed at the intersection of structuring forces, bottom up (genetically speaking) and top down (collectively speaking), and never fully proper nor transparent to its self, is nonetheless typically met, understood, experienced, and largely held to be accountable for itself. But, to what degree is an agentive self—that is, a self with the capacity to act in the world—also a self, given to, and having the wherewithal of, acting

for itself? Put differently, need agency be defined to entail the ability to choose well on one's own behalf? And who gets to decide? It strikes me that without the ability to have a viable sense of acting on one's own behalf, such agency would be rather vacuous indeed. Should this matter? From Butler's meaning of agency as "the assumption of a purpose *unintended* by power" (1997, p. 15), the ownership of one's proper agency entangles in any autonomy that one might have to determine that which one would want and to what ends. And underneath this must be a kind of sufficiency of integrity of self, with oneself, where the self within understands that it echoes the self in others without. If there is an assumption of agency (so as not to be mad) then it seems to be accompanied by an assumption of consistent enough, non-fragmented selfhood, so as to hold together in recognisable ways, through time and across conscious and unconscious expressions of mind.

Yet evidences of incoherences of self abound and confront: I hear my recorded voice and barely recognise the stranger that speaks. She comes to me strangely as my mother and my sister in ways I want to deny. Likewise, the person on the other side of the mirror changes according to the "me" that looks, the other I visit there, and an absent-present, fictive, dis-embodied Other whose weighty gaze I, at times, experience as governing either of us. Who, then, is this person that I am? How do I come to know myself, to know what and how to make of myself—to take my "self" for granted—if not but prompted by the responses of others? Indeed, in as much as others respond to "me" as the gesture of myself, I come to learn myself as meaningful on those terms. Collectively, the experience of such gestures, however, incoherent, coheres in me as an admitted judging voice of an ever-present though impossible to pinpoint Other.

Whereas the expectation of autonomy and agency could be argued as interpellating individuals into responsibility to act on their own behalf, it also underwrites a meritocracy bearing righteous judgment—blaming some and celebrating others in accordance with a premise of selves as self-made, but out of “God-given” (or genetically-given) potential. That self then is the both author and consequence of choices taken with an independent will, self-imposed, to liberate the self that chooses from the enabling constraints of historically derived “withs.”

Moreover, it seems not much of a leap to go from assumed self-knowing and freedom in self-making to that common practice of other-constructing, especially prevalent across micro-events of parenting and teaching: An adult tells a tearful child that the cut does not hurt. Another consoles an anxious student by denying the sense of their anxiety. And, a third takes up the common practice of teaching children to “say they’re sorry,” though the invocation is much less about sorrow felt for another than it is sorrow over one’s own exposed guilt and shame.

In schools, constructing narratives become clinical diagnoses: Children are this or that type of learner with any number of favoured intelligences. Others are ADHD or ODD²⁴ and the child becomes confined by the container given. In short, it may well be no surprise that our continued commonsense is to interpellate others into particular performances of being though we expect them to be themselves—and this we do rather than giving audience, where giving audience, might call attention to a witness of habitable co-presence and sense-making as that vehicle of doing oneself into becoming in an emerging with of being. Instead, other-constructing gestures erase the constructor’s

²⁴ ADHD is the acronym (become name) for attention deficit hyperactive disorder, whereas ODD signifies opposition defiant disorder.

complicity, while enacting complicity in foreclosing particular ways of being. Denials, of that which is deemed inadmissible to the “with,” press the reduction of lives into minimal enclaves bent on keeping abhorrent incoherences out of consciousness.

Still, it is through the naming of the experience of the one and singular as against a plural that we come to know ourselves through language—that I come to know myself, for example, as white against that which is designated not white and against which hues of whiteness come to be defined in the world and so by me. How does a child bring her difference into view with world except but through juxtapositions of her “seeing/‘site’ing/citing” against a “seeing/‘site’ing/citing” world? And how is this possible, given that perception is outward bound and outward seeking, according to the self—metaphorically and literally? At bottom resides the question, “How do I make a livable habitable sense of my self-being, self-feeling, self-experiencing, of affect pulsing through nerve and sinew?” Perhaps I do so through a world that gives audience, granting presence through language and gesture that expresses a noticing and listening and that invites me to find in the world, not an extension of myself, but rather an other, and a world, rendered safe-enough. I invoke the notion of giving audience also (and will develop it further in this thesis) in a sense of opening the possibility of giving grace to presence through co-presence that accepts the rawness of self always in an acknowledging context framed as, “How I am fitting?” and “How can this self that I presently am, in self-acceptance, also self-change in the direction of vitality and broadened consciousness?”

In these conundrums, together with a world that presupposes right and wrong—with “worldly” fairy tales abounding to “cleanly” posit, install, and reinstall fictions of good and bad, and then only permit passage of the right and good, we grapple with what

should be “me” and “not-me” (terms introduced by Winnicott, 1971/2005), what I can allow as myself and what must be forcibly extricated. And so, it is here *with* world, in such grappling that one can locate, too, a primal context (possibly “the” primal tension) for inhabiting the world with anxiety.

Thus, when Butler, borrowing from Althusser, speaks of the interpellating gesture (1990), “It’s a girl,” girl, gal, female, and woman call me and construct me into a gender that I perform and that performs me, such that the two performances meld into a given that becomes my made, and that I take as the natural—where “natural” occupies its venerable throne as most-defensibly legitimate, right, and good. Similarly, in education, ideological discourses spawn cultural myths²⁵ of schooling that summon me as student and teacher, even as I occupy these positions as their “author” (see e.g., Britzman, 2003, p. 223).

Under these conditions, what then can it mean for a learner to undertake and “own” his or her self-creating, to somehow become with the world, but be potentially interruptive to that world’s performative insistence on particular forms of being? What would come of thinking teaching as somehow giving audience to a human disposition to self-author in the with of social and cultural life, where self-authoring as creative enaction of individual possibility necessarily entails other and world? How as teachers might we condition a learner able to act in the world with some sense of autonomy and agency yet mindful of autonomy’s illusion; that is, mindful of the opacity of self to self, of the other in self, and the self in other? In other words, given our thrownness into

²⁵ In *Practice Makes Practice*, Deborah Britzman develops three cultural myths of schooling: “Everything depends upon the teacher; the teacher is the expert; and teachers are self-made” (2003, p. 223).

singular plural being, how can we learn ourselves into living, and ongoing becoming, in well and wise ways?

These questions return us to an orienting intention of this chapter: to set the grounds for thinking agency and autonomy in terms of learning as “self”-making in and with the world. Matt seems not to own his possibility in mathematics. He is confronted by, constructed in, and takes as his own the various contradictory narratives about his world, his learning, and himself as learner. We find him having honed a coping skill of absenting himself into minimalist retreat, while passively accepting and reiterating a façade that denies the very incoherent pathologies that construct and condition him anxious in the first place.

In Butler’s conceptualising, we might describe Matt as having turned toward a conflicted interpellating call (perhaps entailing several contradictory calls at once, some more covert than others) and, in subjecting himself to it (them), as having come to live the incoherence as his own experienced, irresolvable angst. From the perspective of singular plurality, Matt could be said to be struggling to derive a self of sufficient coherence, doing so in the “with” of a number of contradictory defining plurals. His anxiety in mathematics is rooted in deeper cultural existential anxieties: in “the question of Being and the meaning of Being... [as a] question of being-with and of being-together” (1996/2000, p. 35). Thus far, from Nancy and Butler, in broad, brush strokes, this chapter lends a backdrop to conditions of anxiety. Their perspectives will become useful as we consider Matt’s challenges and witness the shifts in agency and autonomy he makes in himself as part of his address of mathematics and world.

That said, there is yet another voice, another fecund discourse, complexity thinking, emerging out of the sciences, that contributes a biological view on the negotiation of singular plural being and of agency and autonomy in terms of anxiety and learning oneself with the world. Whereas the approach to thinking agency through Butler derives with a view from the plural to the singular (through the performative installations of language), the approach of complexity seems the other way around, moving outward from the singular to the plural. Each complementary discourse affords an approach from the opposite side to lend sense at the point of the discontinuity of singular plural paradoxical being.

To put this differently, in attempting to understand and inhabit well the life paradox of singular plurality, like the duck-rabbit illusion, a first step to approaching an ambiguity is to bring it into awareness—that is, to experience the thing from either contradictory side, as it were—and then to work to bring both views into simultaneous relief. Where such ambiguities can be brought into awareness and then resolved the effects can be powerfully anxiety-reducing and consciousness-raising.

To reiterate, we cannot *but* be thrown in this “with” of life: In a recursive world such as we inhabit, there seems no “real” beginning, only a point where one jumps in. Like entering a conversation or even a throng of multiple conversations, one begins from where one enters, always in some middle of infinite possible middles. And so, I merely offer complexity thinking as one such different beginning, thinking place—a tentative foundation²⁶ with a different starting illusionary²⁷ conjecture in this: a definition of

²⁶ I acknowledge that any beginning place is somehow simplistically set and yet to begin one must begin, full well knowing that the working premise from this or that view is not all there is. I begin here because it is good enough and might fruitfully yield a different way of thinking. I begin here because I believe that

biological life in terms of autopoietic structure-determined systems—a definition from which to think upwards to the plural, acknowledging however that such an approach for some, despite all intention otherwise, seems at first to deny the inseparable “with” of being.

Ultimately, the ongoing purpose of the present chapter is to consider the character of this life task of becoming in terms of creating oneself well in and with a shared world—a task that Maturana and Varela term autopoiesis. Their thinking moves the present work of situating philosophical notions on agency, autonomy, and singular plural being in terms of lived everyday experiences of a mindbody that learns, and of anxiety in learning. In particular the study of mathematics anxiety will come to serve as window into a broader cultural pathology of denied incoherence. By “pathology of denied incoherence” I refer to the kind of crazy-making, Alice-in-Wonderland, experience where, befuddled in an incomprehensible confusion of incongruent and confounding stories, one’s immediate world behaves as though unperturbed, clinging to this or that certain narrative in seeming oblivion to inconsistencies and contradictions. At bottom, I intend to interrogate particular anxiety-provoking inconsistencies as exceeding both

agency, whatever that might be, inheres in the possibility of storying differently and then choosing out of a *mêlée* of possibilities a hybrid convergence that moves us toward a wellness of being that is ultimately felt viscerally at the level of individuals *and* the level of the collective; that is, a singular plural of being well.²⁷ To speak of any real outside of our construal, outside of our sensibilities—that is, to speak of any absolute and accessible real, is to entertain yet another fiction. Taking a post-Cartesian, non-dualistic premise on spirit and body, I recognise that any human construal of the real must always be through the lens of our experience of that real (albeit science does expand upon what we can sense, however much that sensing is always on our terms). So the world given by science is one built upon the facts of experience where fact is simply consensual-enough sensing at the level of humans. Consensual-enough sensing names agreement, at the level of the human species, on the communication of lived experience. It relies upon the wisdom of our continued existence as a species in and with each other and the world, but it in no way names any absolute real (unless of course we are willing to change the meaning of real into something defined in our own terms, but that would be a step backward indeed—backward because it closes rather than broadens our view—backward because a broadening view able to enfold the many into and with the one seems to be a view that enhances a coagency for life in general, or at least that is my own fiction, hope, “real”!).

mathematics and schooling and as are given of our still-modern and ever-Cartesian condition. Indeed, I posit these inconsistencies as belonging to a fundamental cultural lack in fostering well-enough meaning and accessible-enough becoming in the *with* of being and I ask what we, in education, might do about it.

But I do get ahead of myself. First, what might be thought up from autopoiesis?

Autopoiesis and Complexity Thinking

The fundamental concern in complexity thinking is one of ontology and epistemology: the ontology of selves (literally and figuratively composing selves) whose nested knowing is embodied in nested systems of being-with and *doing in* and *doing as* the world. Consisting both as multicellulars (collectives of coupled autopoietic unities) and as part of larger unities (societal and ecological) we inhabit—are thrown—in a middle way of experience.

Between the dualistic trap of assuming an accessible real world of objects out there (and its representational match in the mind) and the converse of resigning ourselves to absolute relativism and a “chaos and arbitrariness of nonobjectivity, where everything seems possible,” Maturana and Varela advanced that the “solution, like all solutions to apparent contradictions, lies in moving away from the opposition and changing the nature of the question, to embrace a broader context” (1987, p. 135). In reference to the dualistic trap, they name the broader context “embodied cognition,” also termed “enactivism,” as that perspective that understands mind and body as fully entailing each the other such that doing is knowing is being²⁸. In other words, from an enactivist standpoint, we “do”

²⁸ See also Davis, Sumara, & Luce-Kapler (2008) for a study of the implications in educational contexts.

ourselves into being, indeed and in fact,²⁹ *with* the world—the *with* of which suggests a “real” of sufficiency of fit. All being is a dynamic process of becoming where the structure of the self that acts to become constitutes that structured self’s knowing and the cumulative and sedimented consequences of a history of acts taken and made with world.

Why introduce the terms enactivism and embodied cognition? The moment we come to understand mind and body as one, each entailing the other—that is, the moment we disabuse ourselves of a Cartesian habit of mind presiding over body (and this will be interrogated in Chapter 6)—is for me the moment we allow the sciences and the humanities to begin to talk to, and not past, each other. Every mind experience (conscious or not) is the experiential expression of a material bodily “doing” itself into ongoing being. The inability, refusal, and/or resistance to bring this fundamental ambiguity of mind and body into view and then resolve it, I believe, keeps us mired in a dark age of *techne* absent *phronesis*’ tempering wisdom. It is *phronesis*, in the creation of learning spaces especially, that I press for—*phronesis* born, I hope, out of mindful awareness of the deep intertwining of the sciences with the humanities.

And so, embodied cognition needs first our understanding and then our attention to what wisdom it might offer to the continued questions of anxiety in learning where learning is the co-authoring of selves in conditions of singular plural being—being that, though spoken by Nancy as of mind, must also centrally be of body. For ultimately, when self-change moves in a dialectic of expanding consciousness in ways to honour embodied and embedded selves—doing so through resolutions of experienced ambiguity taken of the world—then I believe that such learning may well be the sort to move individual-

²⁹ Interestingly the etymologies of “indeed” and “in fact” share the same roots through the Latin “*facere* ‘do’ (source of French *faire*, Spanish *hacer*), from PIE root **dhe-* ‘to put, to do’” (Harper, 2001–2012).

with-collective and individual-as-collective in the direction of coming into “being with” the world in well-enough ways for our liking.³⁰

The notion of autopoiesis as self-change is critical here. In a simplistic reading—and that is the ironic place we begin—autopoiesis will appear to name an autonomous agentive self, charged with its own self-creation, thus contradicting the very points I have so painstakingly been trying to make. What’s more, autopoiesis seems to pose a beginning that negates Heidegger’s and Nancy’s emphasis on our thrownness in the world. But, to stop at the ready translation of autopoiesis as self-authoring is to miss complexity’s most significant point: The nestedness of unities. In speaking complexity, the collective *is* a self. In complexity the singular is always and everywhere plural and vice-versa. This point cannot be lost. In order to find our way in, the description seems not to begin with this point, but it is everywhere there. Thus, embedded in the reading of complexity, one can find a language helpfully suited to a materiality of Nancy’s paradox and to addressing the issues of agency and autonomy as especially developed by Butler.

The three conversations together form a fecund ground, with understandings

³⁰ I would describe “our liking” in terms of the wellness of a collective (societal wellness) that partakes of and conditions the wellness of individual member bodies, where wellness entails vitality of life. I do not use the expression to mark any altruistic intention. That which we “like” is something I mean in a primordial way. It signals those pleasures for which our conditioned evolution as human species has adaptively selected in ways that have supported, or at least not hindered, our continued evolution as procreating viable life form.

Damasio describes that kind of vitality at the level of human life: “When the body operates smoothly, without hitch and with ease of transformation and utilization of energy, it behaves with a particular style. The approach to others is facilitated. There is relaxation and opening of the body frame, facial expressions of confidence and well-being, and production of certain classes of chemicals, such as endorphins.... The ensemble of these actions and the chemical signals associated with them form the basis for the experience of *pleasure*” (2003, p. 33).

Interestingly, it is effort that conditions a fit body able to enact itself in the world with such ease; that is, in the absence of dis-ease, where ease is the consequence of far-from-equilibrium-states resolved in ways that are accommodated for, as strength, resilience, or whatever such qualities sufficiently fit *in accordance with* the world that challenges (Juarrero, 2002). Thought this way learning is self-enhancing in terms of one’s embeddedness; and learning well, *with* world, must be likewise world-enhancing. Negotiating both and together requires expansion of consciousness beyond any limited singular purview. Education as the conversation with an historically constituted world, in and through language, describes that project.

rhizomatically intertwined, for perceiving more richly. At the confluence of these conversations, in the emergence of what they say to each other and together, we might deepen our understanding of the anxiety that Matt feels and that the world of his conditioning speaks.

In *Mind in Life* (2007) Thompson's conceptualisation of the deep continuity of life reiterates and expands upon the philosophical underpinnings of embodied cognition, enactivism, and post-Cartesian non-dualism. He writes:

In life every beginning is unique, but none is isolated and self-contained. . . . Every beginning has a beginning before it and another one before that, leading back through the receding biological past to its time and place of origin, the beginning of life on Earth. . . . We harbor the past everywhere within our bodies. (Thompson, 2007, p. 91)

Attending to “self-cause”³¹ as life-distinguishing property and noting an organisational structure of continual, circular self-generation, Maturana and Varela developed the theory of autopoiesis: literally self-creation (1973, 1980, & 1987 in Thompson, 2007, p. 97). Describing and characterising the nature of life systems historically across a long line of subtly shifting evolutionary “begets” and, ecologically, all the way out to the biosphere, autopoiesis broadens the conception of life to comprise all autopoietic systems in terms of fractal emergences and self-generative bounded forms composed of and comprising other forms. They look to the relationality of life to address the here-and-now question: “Is this a living thing or not?” (Thompson, 2007, pp. 96–101); and they outline the organisational structure and dynamic processes of autopoietic

³¹ See Alicia Juarrero on the problematic elimination of self-cause as a viable causal form in the history of Western philosophy (2002).

systems as prototypical of life. Three organisational criteria define such systems (Varela, 2000 in Thompson, 2007, p. 101): (a) a self-delineating “semipermeable boundary”, (b) an internal “reaction network”, and (c) the “interdependency” of boundary and network such that internal network reactions continually produce boundary components even as the boundary reciprocally contains and maintains the very conditions necessary to ongoing regenerative internal work (Thompson, pp. 101–103).

The form or pattern of the autopoietic organisation is that of a peculiar circular interdependency between an interconnected web of self-regenerating processes and the self-production of a boundary, such that the whole system persists in continuous self-production as a *spatially*³² [emphasis added] distinct individual. (Thompson, p. 101)

Put differently, according the theory of autopoiesis, living beings, for example living cells, are the physical arbiters of their self-organisation, including the assemblage and maintenance of the very boundaries that, in demarcating the edges of self, bind and give recognisable definition to selves as selves. Notably, to phrase autopoiesis in terms of self-authorship is not to deny from whence arrive the parts whose redefinition and assemblage come to be created. Indeed, the point of the variable permeability of a boundary is its strategic admission of or even fusion with a world. That the border membrane be produced and maintained as a product of the internal network, is assumed “decisive for characterising an autopoietic system as an autonomous individual (Varela 1979)” (Thompson, 2007, p. 105)—where autonomy is, crucially, “organisational closure

³² Note that the definition of life specifies spatial distinctiveness, not conceptual. The processes by which material changes in brain/body (i.e., in structure-determined systems) come to give an experience of world in mind comprise the foci of the next two chapters.

of production processes” (Varela’s distinction, in Thompson, p. 106). Note again that organisational closure is material, of the body. Though necessarily implicating the mind, just how, is the subject of subsequent chapters. Moreover, to say that the material self is organisationally autonomous says nothing of the original shaping of that organisation, nor of the source of its component parts including the relational mapping of those parts—all of which emerge with world, both historically in time and spatially through the porous boundaries of the self in question.

At this point, an “aside” is in order. I want to acknowledge how the character of this description may give one the impression of finding oneself in a dream, without recollection of beginning nor end, but having the sense of fullness both ways. In the midst of such a dream that is our real, we encounter existence, call it life form, evidencing (within the limitations of human observation) life’s utmost compulsive enaction: its self-continuance through recursively adapting self-production. Processes of ongoing metabolic being necessitate the admission of particular influences from the external world and the extrication of unwanted parts. But, the available raw material of potential influence and the regulation of passages (whether conscious or automatic) is also a function of that self’s co-history with and in that world, where world has acted as ultimate arbiter of the condition of good-enough-to-*have-continued*³³-to-exist. That is, present existence is a consequence of good-enough learned fit—of coherent adaptation and adaptive coherence of self with world and world with self—and this applies to that

³³ Note here the past tense. Fitness is always to be vetted by the world and that world itself is evolving. Thus, what suited before may or may not continue to suit and this depends upon the emergent trajectory of the *with*; that is, the dynamic co-evolution of coupled organisational structures.

which has been learned phylogenetically, in co-evolutionary terms, and ontogenetically across the course of that organism's immediate and situated history.

Accordingly, definitions of autonomy—in limiting the question to the here-and-now issue of “Is this ‘thing’ alive?”—must, with slight of hand, bracket and highlight the individual above the *with*, it would seem to me. There is an underneath question, “Can we blame this self for itself?” or perhaps more generously posed, “Is it responsible to/for itself?” I want to answer no to the first question and yes to the second and I wonder openly at that desire.

In any case, one might observe that the autonomy of an autopoietic self appears given to be born and borne physically by that self at the instant of its definition, insomuch as the birthing and the bearing can be located in a co-occurrence. But then again, moments can be long or short depending on the scaled view one takes. The question is left unaddressed as to whether, or to what shifting degree, this “originary” constituting act, the one instantiating the autonomously definable self (as cited, including the act's *a priori* conditioning contexts³⁴), carries responsibility, ownership, and authorship for the subsequently self-generating self. In other words when does ownership and autonomy shift; for life does not but come from life? It would seem that Maturana and Varela put such ownership at the reproductive replication of the cell, yet they are mindful to recognise the history of the world in each moment of new being:

As living beings... we are descendants by reproduction... forebears who go back in the past more than 3 billion years.... [*and*] as organisms, we are multicellular beings and all our cells descend by reproduction from the particular cell formed

³⁴ By “conditioning contexts” I mean *contexts that condition* and *conditions generative of contexts*.

when an ovule united with a sperm and gave us our origin. Reproduction is therefore inserted in our history in relation to ourselves as human beings and to our individual cell components. Oddly enough, this makes us and our cells beings of the same ancestral age. Moreover, from a historical standpoint, this is valid for all living beings and all contemporary cells: we share the same ancestral age. (1987, p. 56)

Acknowledging these shared histories, Maturana and Varela build their argument up historically from first life on earth. They trace their thinking, teaching it according to a literal time-honoured trajectory. In the process, they answer the questions of what is life, as autonomous life, in terms that hold the individual autopoietic system in focus. In subtle difference, Nancy begins with human being in the here-and-now and locates, in a strangeness of common ancestral origins,³⁵ *being with* as central ontology (1996/2000, pp. 5–10). It is a different vantage taken of the same narrative and so, of course, shades it differently. The problem of being well is accentuated in Nancy's view with horizons both aft and fore and so is complemented by the work of Maturana and Varela.

At this point, there is an unsettled matter wanting attention. To be sure, it has been settled numerous times elsewhere, but as yet not in the everyday places, so I mark it here: the matter of embodied cognition vis-à-vis Descartes' mind-body dualism; that is, Cartesian dualism being an ever-thriving story entangled in much that is angst-generating in the world. At bottom, may be the question: If mind and consciousness are the

³⁵ Nancy (1996/2000, pp. 5 – 10) explores the expression “people are strange” and the bizarreness of originariness as core and defining kernel of common being. “Since I say that ‘people are strange,’ I include myself in a certain way in this strangeness” (p. 6). We are ever confronted at the strangeness of differences in common, in and as the everydayness of being. He writes “The other origin is incomparable or inassimilable, not because it is simply ‘other’ but because it is an origin and touch of meaning. Or rather, the alterity of the other is its originary contiguity with the ‘proper’ origin. You are absolutely strange because the world begins *its turn with you*” (p. 6).

phenomenological and conditioning experiences of body—and I believe they are—then how can the physicality of singular-plural-being not but be thought as troubling paradox, too confounding to engage? Put differently, when I see, feel, touch, in short, perceive, my bodily self, it comes to me as indeed singular. How then can it also be plural?

Making a tangible sense of the paradoxes of complexity—of nestedness, of recursive self-creation, of individuality (the undivided *with* of unity), and singular plural being—seems to run counter to felt experiences of mind as something apart from body (perhaps and especially set there, apart, because of the middling impetus of language as medium of human structural coupling). How do we give, make, take in mind an experience of ourselves as the co-presence of a viable negotiation of singular plural being? Such paradoxes threaten the limits of reasoning (logical and analogical), pressing a want for explanations that give of prediction and agency, and exacerbating a yearning for things-in-(certain)-control, whose absence jettisons one to want to defer responsibility to some reliable sovereign Other. How then can education counter such tendencies, presuming it ought to? And how might we begin to think and learn ourselves as consciously plural, but do so without losing ourselves nor our presence in the process? Where is cognition and who is the self, the “me” as “us” that minds?

Cognition

Humberto Maturana describes a cognitive system as “a system whose organisation defines a domain of interactions in which it can act with relevance to the maintenance of itself” (in Thompson, 2007, p. 124). The process of cognition according to Maturana is “the actual... acting or behaving in this domain. [As such, l]iving systems are cognitive systems, and living as a process is a process of cognition” (p. 124). Before

delving into cognition proper, it seems wise to tease apart several potentially confounding notions: (a) the mediacy and immediacy of mind, (b) embodiment, and (c) embeddedness.

Mind and body: Embedded-embodied being.

By mediacy of mind, I point to a function of mind as the medium of sense-making of the body, and thus implicated in second-order reflective awareness—for example, in mentalisation and mindfulness practices (see Chapter 4 for details on these practices). But also we can speak of the immediacy of mind, which alternatively frames mind as literally and always (at the same time) first-order phenomenal experience of neurochemical bodily activity—mind being the qualia of the doing that is being, as it were. This second meaning of mind is what is expressed when we say that the mind is embodied and when we speak of embodied cognition or espouse an enactivist perspective. Our actions, both doing and knowing, are the expressions, the movements in being, that make of being its condition of aliveness.

However, the term embodiment seems also to have a different usage: to mark one point-of-view on a reciprocal relationship, where the term embeddedness names its complement. This is perhaps easier to understand if we attempt to move beyond our human situatedness. Consider a forest ecosystem as autopoietic unity or, put differently, as a non-linear dynamic system. We could say that the emergent nature of the collective we call forest—its nonconscious self-experience, perhaps, if we could name such a thing³⁶—is the synergistic expression of its constituent parts. As such, we could speak of

³⁶ I use the qualifier *nonconscious* to describe this self-experience and mark that I am not prepared to argue that the forest knows itself in any way paralleling how we might know ourselves; though, as I understand them, perhaps Bruno Latour or James Lovelock might attempt just such an argument.

its “mind” as *in* its “life”, deeply so. Put differently, we could argue that the forest’s emergent properties (mind) are fully entailed in the recursive, trans-level processes of the bodies (part and whole) that the forest comprises. Accordingly, the “mind” of the forest could be said to be embodied. Taking a reciprocal view, then, each part of the forest—tree, mite, berry, squirrel, dirt—is embedded in the forest; which is to say that the properties of the forest as collective feed back (and forth) to its constituent parts. This is what is implied when speaking of transphenomenal interactions: recursive and reciprocal influences, co-confluences, across levels of organisation. Importantly then, each organism in the forest, in some deep sense comprises, at once, the whole of the forest. These are the meanings invoked—not to be lost to trivial interpretations—when we speak of embodiment and embeddedness, and when we remind ourselves of the world in the grain of sand. It is in this way that the consideration of Matt’s circumstance invokes the whole of his conditioning world and can serve as hermeneutic window on the diffusely permeating problems of that world.

Moreover, any flux of autopoiesis and autonomy, too, is somehow deeply connected to conditions of embodiment/embeddedness. From the human perspective, we too co-compose larger collectives while at once comprising smaller ones. Notably, not all parts are autopoietic: The degree of self-authorship turns on the tightness of structural coupling at that self’s level of co-organisation with other selves. Nor, for that matter, are all parts that compose a collective singularly alive. To what degree is a heart cell, or a heart, autopoietic? Are they alive? If so, do they constitute in and of themselves life form? What would it mean to be completely autonomous and autopoietic except but to exist in the impossibility of one’s aloneness? And even if such a thing were possible,

there would be no collective to mark the condition of agency—to name agency into being as such, for any notion of autonomy must presuppose another from which one is free. Is such highest other a god then? Opposite extremes of unity and separation describe different takes on the same impossible phenomenon: an omnipotent, omniscient other that by virtue of its utter unity and separation must obliterate itself. The condition of our co-singularity and co-plurality is the condition of our ownmost possibility.

And so, we have life, *being* in a strangeness of construed middle-ness³⁷—and life, consisting as varying fractal iterations of structural coupling with corresponding variations in proximity of coupled parts. Notably the strength and proximity of coupling bear on the degrees of autonomy and agency availed to individual parts and wholes as autopoietic. Compare, for example, the less coupled oak forest versus the rhizomatically synchronised forest of trembling aspen(s). Is an ant, in an ant colony, autopoietic and autonomous? To what degree can we claim ourselves autopoietic and autonomous? And how might we characterise differences in degree, as we shift perspective in time and space, according to the framed positions we fashion ourselves as co-composing? In short, there seems a continuum on degrees of autopoiesis and autonomy that very much depends upon the tightness of structural coupling, the strength of fit, between elements constituting any system.

³⁷ To announce that the notion of “middle” is strange is to mark the non-linear circulation of time and space. Nancy writes, “Circulation—or eternity—goes in all directions, but it moves only insofar as it goes from one point to another; spacing is its absolute condition. From place to place, and from moment to moment, without any progression or linear path, bit by bit and case by case, essentially accidental, it is singular and plural in its very principle” (1996/2000, pp. 4–5). Accordingly, there can be “no *mi-lieu* [between place]. It is a matter of one or the other, one and the other, one with the other.... From one to the other is the syncopated repetition of origins-of-the-world, which are each time one or the other” (pp. 5–6). For these reasons, the notion of medium shifts from passages between and across, to a consciousness of “withness”—from bridging dis-positions to inhabiting com-positions.

Viabile negotiations of singular-plurality.

With these thoughts in mind, turn to detailed descriptions of the pragmatic workings of “autopoietic, autonomous” selfhood. Gerald Edelman (2004, 2007) writes of embodiment in terms of consciousness (mind) as quite literally the phenomenal experience of neuronal activity (brain/body). Antonio Damasio goes further to parse affect—in mind as feeling, in body as emotion—all the while affirming a post-Cartesian non-duality (2003, p. 301). Consider Edelman’s “brain-based epistemology” (2004, 2007) of consciousness and mind-in-body with Maturana’s notion of cognition as a necessary entailment of embeddedness and survival. These discourses join numerous others in bridging the mind-body gap and dealing a significant theoretical blow to Cartesian dualism.³⁸

Life, as life, exists not in a physical vacuum. As explicated above, to maintain viability in a world (at least long enough to be recognisably present in our reckoning) any autopoietic system must contend with a boundary-permeating admissible world and some kind of adaptive selectivity governed by a final criterion of continued existence. And taking cognition to pertain “to the behavior or conduct of a system in relation to its environment” (Thompson, 2007, p. 124) then successful (where success means survival) autopoiesis must presuppose cognition (so say Maturana & Varela 1980, in Thompson, 2007, p. 99) or, in the least, we could say that the defining criterion, sufficient and necessary to life cannot be autopoiesis alone unless autopoiesis *entails* cognition (Thompson, 2007, pp. 122–127).

³⁸ See Nancy (2000) on the problem of the Cartesian solution: In togetherness and God (p. 60); Descartes (p. 66); divine Other (p. 79); and Other, theology, and spirit, (pp. 80–81).

Notably, the membrane that binds and distinguishes the autopoietic self from the world in which it is bathed is the self-same boundary that selectively admits the bi-directional passage of world and self across boundary membranes in ways to functionally and materially couple self with world and that, in the doing, works to maintain the viability of the autopoietic self in its worldly inhabited context. Although self-authoring invokes a kind of circular organisation that makes the self an individual; “it does not mean that the cell [or any such self, I would add] makes itself apart from its environment” (Thompson, 2007, p. 118). That is, given the permeability of membranes, organisational closure neither implies functional nor material closure.

The significance of life as we know it—as a phenomenon of evolution, and nested in scales of interdependence all the way up to planetary domains—is that to count, as a living system, requires ecological embeddedness (Thompson, p. 118). Moreover, systems of embedded systems all the way up are constitutive of life and all the way down embody consciousness as a self-consciousness that is other than itself (see Nancy, 2000, p. 77)—and this is true however rarely and minimally conscious the self is to that construction. Building up from eukaryotic cells and designating these as typical first-order autopoietic systems, Maturana and Varela (1998) describe multicellular organisms as second-order autopoietic systems that are structurally composed of coupled individual cells. They further develop their thesis to the level of metacellulars as third-order autopoietic systems of more- or less-loosely coupled multicellular organisms, for example in colonies and societies (pp. 10–11). Bootstrapped to such multicellulars we discern all manner of non-linear dynamic systems (especially, for example, knowledge systems) riding atop and thus behaving in parallel concert with the autopoietic systems to which they are linked.

Whether in first-order (as individual cells), second-order (multicellular organisms), or third-order (colonies and societies) autopoietic systems (though the margins of selfhood be unclear), the challenge of autonomy figures prominently. Life systems exist within, compose, and likewise are composed of grander systems in deep, fluid continuity. I take such nested structuring of levels of complexity as fully comprising Nancy's fundamental paradox of singular plural being, (as cited in *body* and thus necessarily in mind) and ultimately conditioning the difficulty of our psychic becoming in and with the world. It describes the challenge of our coming to intrinsically know and consciously inhabit our ownmost coexistential³⁹ being, with deep integrity, all the way out and in because both directions fluidly co-occur and co-implicate each the other.⁴⁰

Thus, it could be said that issues of performativity and interpellation run beyond individual human identity extending through the life-world, from the humblest form to the most grandiose. Our histories, shared and collected—that is, the sedimented choices made by any system—constitute and create the system as their author. And the self that is thus installed through the power of a system assumes its own power to subsequently choose. We call such choice freedom and will.⁴¹ It is the free will to perform oneself into and with the world after-the-fact of our being which is in itself an ongoing becoming never quite after-the-fact. Such is the conundrum of recursive, self-cause: life nested into and of life—the living comprising and comprised by the living, up and down scales of emergence. So how do we approach, nay live, this ongoing feat of *being with* without

³⁹ On a coexistential analytic: “There is no ‘meaning’ except by virtue of a ‘self,’ of some form or another. . . . But there is no ‘self’ except by virtue of a ‘with,’ which, in fact, structures it. This would have to be the axiom of any analytic that is to be called coexistential” (Nancy, 1996/2000, p. 94).

⁴⁰ See Nancy (2000, e.g., pp. 77 & 84) for how they are indeed in some sense the negation of each other.

⁴¹ Recall from above how, in *The Psychic Life of Power*, Butler (1997) develops that we are installed by power and then claim it as our own to rupture the very structure that installed us.

crippling and contracting anxiety in regards our own individuality and agency? How do we learn ourselves well in the with? The question is, of course, central to understanding Matt's anxiety and so its exploration becomes essential precursor to understanding what is at play in the situation of learning in general and mathematics learning in particular.

Becoming in a Fractal “With”

To summarise thus far: Living, the creative enaction of selfhood, as interlaced shape and shaping of being, exhaustively comprises a self's ongoing coming-into-existence with and in a world that is likewise becoming.⁴² Life is not static. Embedded in a strangely-unknowable, noumenal⁴³ world, we human beings, come to learn of that world (and of ourselves with and in it) through the very constraints it—our material selves included—imposes on phenomenal experience, and within that, creative apperception⁴⁴ as possibility. Whatever we might conceive as ontologically “real”—however illusive and illusionary, fictive or factual, we might surmise our construals of such a real to be—our mind-bodies do coexist and continue to co-emerge dialectically with and in an experienced reality (as felt Being and Being-with *along side and with* semiotic mediations and construals of the visceral, social, cultural, and virtual) that enfolds us and that we each enfold.⁴⁵ Moreover, this human becoming, as the reflexive

⁴² From a dynamical systems perspective this opening statement can be restated in the words of Maturana and Verden-Zöller (2008) in renovating the notion of adaptation: “Adaptation is necessarily a constant relation of operational coherence between the organism and its niche in the continuous realization of its living... [wherein] both organism and niche spontaneously change together congruently” (p. 5).

⁴³ Noumenon refers to an object, a thing in itself independent from the mind and to that extent unknowable.

⁴⁴ Milner (1972/1987b) describes “what Winnicott came to call ‘creative apperception’, the colouring of external reality in a new way, a way that can give a feeling of great significance and can in fact, as he claims, make life feel worth living, even in the face of much instinct deprivation.... the sudden moments when one’s whole perception of the world changes—... that makes the whole world seem newly created” (p. 249).

⁴⁵ “‘The genesis of the whole by composition of the parts is fictitious. It arbitrarily breaks the chain of reciprocal determinations’ (1963, p. 50)” (Merleau-Ponty in Thompson, 2007, p. 69).]

imaginative shaping of an ontological self, is felt and formed in concert with negotiations of epistemological self-trust⁴⁶ in, among other things, who or what we know ourselves to be, and what our experiences tell of the always-already⁴⁷ world greeting us, even as that world composes us and we compose it. Indeed, a familiarity of a self to a self deepens, as lived experience becomes embodied history and hermeneutic biotext⁴⁸ of linked, memoried moments.

“The intersubjective⁴⁹ symbolic representations that configure the human mind are the product of generative and generational processes on three time scales—phylogeny, history, and ontogeny (Tomasello 1999, pp. 10, 202-203)” (Thompson, 2007, p. 411). At the same time, our *thrownness* into the world (as Heidegger elucidated; in Stolorow, 2009, 2011) consists in a concurrent happening at three interlaced and nested scales of existence—cellular selves, human selves, and any number of eco-bio-cultural collectivities that, to varying degrees, themselves enact coherence and adaptation as autopoietic unities. “The enactive approach and phenomenology... converge on the proposition that subjectivity and consciousness have to be explicated in relation to the

⁴⁶ “Most of us do intellectually trust ourselves by and large. Any remotely normal life requires such trust” (Foley, 2001, p. 3). (See Lasch, 1984, where this is called into question in today’s times.) Epistemological self-trust refers to trust in one’s ability and ways of forming judgments, of reasoning, of coming to know about and make sense of one’s world. I refer to what Foley (2007) describes as intellectual trust in ourselves—in the “reliability of our faculties, practices, and methods [and]... in the overall accuracy of [our]... opinions” (p. 3). See Foley (2007) and Lehrer (2010) for further discussions on the topic.

⁴⁷ Thompson paraphrases Husserl describing the world as “always already there, existing in advance for us, as the ‘ground’ [the pregiven soil including one’s forebears, culture, and embodied histories out of which everything is generated and nourished] and ‘horizon’ [the given... taken noematically as a structure of appearance, but taken noetically as a structure of consciousness] of any human activity” (2007, p. 35).

⁴⁸ The biotext names a multitextual, multinodal, non-linear networked form of narrative. It is what might be thought a participatory genre of life writing that invites the reader in by emphasizing “an ongoing sense of discovery, the idea of the subject as performative and in process within the text (*Errata 24*)” (Saul, 2006, p. 4). In blurring the “borders of biography, autobiography, history, fiction and theory, as well as poetry, prose, and visual representation” (Amazon editorial review of Saul, 2006) the biotext seeks “to displace the idea of a single, unified (traditionally male) autobiographical subject” (Saul, 2006, p. 4) by creatively revisioning “so-called autobiographical truth” (p. 5).

⁴⁹ Nancy (2000) explicitly abhors this word intersubjective for the very reason of its dis-position of singular plural being.

autonomy and intentionality of life, in a full sense of “life” that encompasses... the organism, one’s subjectively lived body, and the life-world” (Thompson, 2007, p. 15).

In this trajectory of becoming, immediate past and future horizons collapse into sequences of lived present moments⁵⁰—holistic phrasings of mind in a “kind of dialogic equilibrium with the past and future”, that together trace a path of seeming continuity of self (D. N. Stern, 2004). With each path taken, infinite others are foreclosed. The after-the-fact impossibility of alternative trajectories render a compelling illusion of linearity. In hindsight, bearing all the vestiges of linearity, this phenomenon of forgotten dropped threads co-occurs at multiple, nested levels. Fractal aggregates of micro-moments, through meso-moments, to macro-moments comprise a decidedly complex non-linear dynamic to condition an emerging self-recognition-become-ontological-reality (see e.g., Lewis on scales of emotional self-organisation, 2000). This stubborn linear conception of a self’s determination—as part environmentally given, part genetically made (the infamous nurture-nature debate)—interweaves in a conflicted cultural consciousness that likewise demands personal accountability for self-determination, notably in terms set and

⁵⁰ Of note, according to Daniel Stern (2004) of the Boston Change Process Study Group (BCPSG), we move through everyday lived experience with a consciousness that alights across present moments (much like a bird flits from branch to branch where each perch is that which enters awareness). Thus, *chronos* (the passing points of time, along a theoretically “Real” number system with each point infinitely divisible) is experienced as *kairos* (a thickening and thinning of moments of time, likened to an “Integral” number system—again, even at the level of time perception, we reduce the world through the limits of our experiencing faculties and then, like a movie reel or like the pixels on extreme, we connect those bounded entities into an experience of continuity—but the continuity is our subjective creation superimposed upon that which we “extract” through our primal sensorial experience of the world). Owing to our perceptual faculties, present moments come to us in holistically experienced time phrases consisting of immediate past reverberating into the present together with immediate future as an embodied foreshadowing (This “trilogue”, of duration 1 to 10 seconds [~3 to 4 on average], “occurs almost continuously from moment to moment in art, life, and psychotherapy”, p. 31). Each “phrase stands as a global entity that cannot be divided up without losing its gestalt. . . . The mind imposes a form on the phrase as it unfolds” (p. 26). Yet, present moments—experiences as originally lived—are often hard to explicitly grasp (as practiced in mindfulness traditions) because we so readily slip into third-person objectification on experience. This second experience “is still a first-person experience about trying to take a third-person stance relative to something that just happened—that in some sense, explains its essence away.

governed by a dominant, heterogeneous, hegemonic collective. We are given to take responsibility for ourselves, but how can we accept whilst at once refusing any responsibility for, any complicity in “the they” of us, as I believe Heidegger might put it (see Stolorow, 2011)?

Crucial, it seems to me, is an appreciation of the ongoing interplay of becoming as the nested, iterative, autopoietic work of self-making and self-giving at the level of self but also in concert with self-making and self-giving at the level of the collective. Put differently, our being emerges as against and embedded with and in a life-world of experience that reciprocally experiences and expresses itself through us; and this reciprocity of being—not limited to the site of human individual Being—characterises social and life forms up and down scales of existence. Selves, as “autonomous systems [,]... enact an environment inseparable from their own structure and actions.... for they constitute (disclose) a world that bears the stamp of their own structure” (Thompson, 2007, p. 59). If we are being for anything we are being for the self where that self is singular-plural. In just this inheres the apex of life’s meaning.

Approaching Mind in Life

It asks a conceptual leap to link the psycho-social as phenomenological entailment of the physical. Freud advocated: “One has to bear in mind that all our tentative psychological theories will need to be grounded at some point in organic systems” (1914/2006, pp. 362–363). This is the intention enacted in neurophenomenology and complexity. Maturana and Varela trace a conceptual trajectory from unicellulars to multicellulars to metacellulars and, across these same unities, a parallel continuum of increased separation, decreased coupling strength, and thus greater

situated autonomy (1987, pp. 198–199). Again this appearance may ultimately owe to a matter of scale in time and space—how closely one looks. Nonetheless, in keeping with the human position and related perspective, the appropriate scale is likely the one within which we articulate⁵¹ ourselves, that is, in which reside our immediate experiences. Thus, in human societies where spaces are said to be the greatest and where the autonomy of elements is at a maximum (according to Maturana & Varela, p. 199) we are pressed to think productively with Nancy (2000) about the society, the dis-position⁵² of bodies, and the question of living well in the paradoxical *with* of being, where the experience of that *with* is psychically and socially languaged⁵³ into felt experience. This perspective, interestingly, is also that reflected in relational psychoanalysis whose “key defining

⁵¹ I mean “articulate” in both senses: that of languaging into existence and that of movement at a joining point.

⁵² Nancy on com-position and dis-position speaks of language and bodies in ways informative to questions of mind and body. On language he writes, “*Language says the world; that is, it loses itself in it and exposes how ‘in itself’ it is a question of losing oneself in order to be of it, with it, to be its meaning—which is all meaning*” (Nancy, 1996/2000, p. 3). And language relates to bodies, as follows:

The ontology of being-with is an ontology of bodies, of every body, whether they be inanimate, animate, sentient, speaking, thinking, having weight, and so on. Above all else, ‘body’ really means what is outside, insofar as it is outside, next to, against, nearby, with a(n) (other) body, from body to body, in this dis-position.... a body is the sharing of the departure from self, the departure toward self, the nearby-to-self without which the ‘self’ would not even be ‘on its own’ [à part soi?]” (p. 84)... versus “language is the incorporeal.... saying is corporeal, but what is said is incorporeal. Language... is the outside of the world in the world.... it is the exposition of the world-of-bodies as such, that is, as originally singular plural.... Language is the exposing of plural singularity. (p. 84)

⁵³ The project here may well lie between that of Freud’s and that of Marx’s: Nancy writes “Psychoanalysis still represents the most individual practice there is, and, moreover, represents a sort of paradoxical privatization of something the very law of which is ‘relation’ in every sense of the word. Curiously, what happens here may be the same as what happens in the economy: ‘subjects’ of exchange are the most rigorously co-originary; *and* this mutual originarity vanishes in the unequal appropriation of exchange, such that this coexistence vanishes in the strong sense. It is no accident, then, if Marx and Freud represent two different, yet symmetrical, projects; each puts forth an indissociably theoretical and practical attempt to get at ‘being-in-common’ as a critical point (of disorder in one, of sickness in the other) of history or civilization.... It seems, then, that the dialectic Marx thought he foresaw unfolding appears to be definitively blocked [so too Freudian].... This dialectic, this contrast, and their uncommunicative and paralysing confrontation indicate the knot of questions, expectations, and anxieties of an epoch. How can being-together appropriate itself as such, when it is left up to itself to be what it is, when it is presented in a formulation that is stripped down and has no substantial presupposition or, in other terms, lacks symbolic identification? What becomes of being-with when the *with* no longer appears as a com-position, but only as a dis-positions? ¶ How are we to understand the *co-* as *dis?*” (2000, pp. 45–46)

feature... is its radical interpersonal stance, insisting that there is no such thing as a mind on its own, only a mind-in-relationship” (Holmes, 2011, p. 305). This is not to posit mind outside of body, but rather to think of mind as the individual phenomenal participation of a collective languaged being. Mind might be said to be the phenomenality of singular plural being.

Central to both autopoietic and psychoanalytic contexts is the interplay of boundary permeability and self-authorship in, learning contexts of, adaptive self-coherence and coherent self-adapting—to the end of ongoing viability as life form. Yet, the matter of interest and concern in education, I would hope, is more than good-enough, more than merely viable. For surely, we reach for, and rejoice in, well-being and not mere survival—where well-being names vitality as that ability to live life with the ease afforded as ironic consequence of principles of sufficiency in response to effortful practice. In realms biophysical, we readily understand the terms and goals of such practice: We exercise the body, pressing it against contrived obstacles. Somewhat like the pup that engages in rough and tumble play in preparation for the needed adult skills, we continue in adulthood to lift weights or run distances under conditions and to degrees not mandated by necessary life circumstances. That is, we press our bodies to adapt by subjecting ourselves to self- or other-imposed perturbations, trusting the adage that “what doesn’t kill us makes us stronger.” What an intriguing, forward imagining, species are we!

How might it benefit us to think education as phenomenon, at the scale of the collective, whose project is motivated by a long view on sufficient adaptation—a mind toward prompting more-than-immediately-necessary fitness in individual selves for the

benefit of plural existence, and vice-versa, reflexively so? Moreover, is reflective thought in the *with* of world—as in practices of autobiography, mentalisation, and mindfulness, for example—that comparable means whereby a particular quality of consciousness colours well our psychic selves?

The permeability of boundaries, especially psycho-social ones, immediately draws into relief the manner, degree, and nature of other-constitutions-of-self and self-constitutions-of-other. Given messy collections of selves into loosely bound societies, oft-times rigidly policed (ironically so), possessing bootstrapped and variously construed virtual systems of knowing, how are we to think and live well Nancy's sense of singular plural being?

Accordingly I locate the subject of this dissertation's interest as at the interplay of these three types of systems: human selves, human collectives, and bodies of knowledge as themselves selves. I question the tragedy of debilitating anxiety when exclusionary practices jettison angst-ridden selves out of "the know" and put knowledge into a nebulous governing ether as inaccessible and divisive scimitar of a disembodiment Other. Such anxiety—mathematics, Narcissistic, Cartesian—signals the consequent inadequacies, felt as minimal selfhood, that deeply compromise any possibility of well-being.

Indeed, I am concerned as to these psychic challenges of selfhood, of learning to inhabit demarcated boundaries of self while reaching to the other in a paradoxical *with* of nestedness. In attachment theory, studies of narcissism, and the psychoanalysis of object relations and transitional spaces we begin to get a sense of the potential richness of living well in singular-plurality, unparalleled among species. With language of gesture,

mimicry, sight, sound, and word, humans uncannily breach the boundaries of self and live the priorness of *Mitsein* over *Dasein*.

My questions and subsequent excursions in this chapter and forward explore the ontogenetic evolution of self-other-consciousness, as embodied cognition, from first experiences of physical separation (in the first few weeks of life) through varying degrees of awareness of self in the *with* of life's being. The premise from which I begin is one that Maturana and Varela develop: that the theory of autopoiesis is more than a strong metaphor for understanding human sociality. In the pages that follow, I call upon autopoiesis (both physically enacted and phenomenally experienced) to think through and with psychoanalytic explorations of learned psychic negotiations of singular plural selfhood. That is, I explore how we come to construe ourselves, through body and language, in relationship, and with attuned parenting. These discussions will call up the creative play, described by Winnicott (and Gadamer), as occurring in transitional spaces. Understanding, with Nancy, that these transitional spaces are co-inhabitations, how do they enable a coming into a self that understands itself in terms of a world taken as both given and made, real and construed, plural and singular?

To reiterate, if we are to dig into the world of existential anxiety, we do so upon a depth work into what it might mean to exist where existence entails a life movement of becoming. That task set forth is one that understands learning as the ongoing recursive trajectory of self-becoming in the *with* of singular plural being. If we, with Nancy from Heidegger, assume the priority of the *with* of Being (Nancy, 1996/2000, pp. 26–28), and if autopoiesis describes the processes of embedded and embodied self-authoring, then how does a human self move from an infant state, absent self-consciousness, to someone

such as myself writing and reflecting upon those very processes? In short through what means do we learn ourselves into being in any *with* at all, anxious or not?

Baby Steps

The starting point in development is a position of relative nondifferentiation between self, other, and the world (Baldwin 1906; Hobson 1993; Merleau-Ponty 1964; Piaget 1936/1963, 1937/1971; Vygotsky 1998; Werner & Kaplan 1963). From an observer's point of view one sees the infant interacting with others and the world, but at first the infant has not constructed these distinctions. The differentiations between inner and outer, subject and object, and self and other occur gradually within interaction (Müller & Runions 2003). (Carpendale and Lewis, 2004, p. 87)

Within a matter of weeks, a newborn performs its bodily self as distinct and separate from other and world, learning its own bodily enaction through explorations of the 100 percent contingency of muscular innervation and the gradual smoothing of movement in learning. "It is accepted that infants possess from the earliest days (by 3 months or so at the latest) a distinct sense of their integrity as physical beings" (Fonagy & Target, 2007a, p. 922)—a perspective on self as physically separate that in the present Western ethos is unlikely to change. Accordingly, it is an unanswered question as to whether, when, or to what extent the emerging being will return to any mindful knowing of its bodily self as immersed and continuous with/in that physical world—however unperceivable the physicality of that world may at "face value" sometimes feel (e.g., we are largely unaware of a continuity of air within which we exist and that connects and

sustains us). This is the case even though the living self is continuously constituted and reconstituted, materially, of and from the world within which it is bathed.

It will take longer for the child to work its physicality of mind, the brain (as the development and refinement of preferred, habitual, selected-for patterns of neural connection and innervation) into an assumption of itself as known and knowing being (i.e., recognised, recognisable, and recognising⁵⁴) enacting itself into and with the world. Such self-awareness will come through the exploration of acts experienced as done onto the world (e.g., dropping food from a high chair) and co-enacted with others in the world (e.g., pointing at something and seeing mom's gaze move in the same direction, thus marking basic categories of experience upon which language will be construed). I posit that it is the second sort of doing—now being explicitly mapped out in studies of infant-caregiver attachment and attunement (see e.g., Carpendale & Lewis, 2004; Gergely, 2007)—that brings a self into its social *with* of being. The uniquely emergent trajectory of such acts—as are thus taken—enable certain becomings and foreclose others.

Importantly, co-texturising⁵⁵ the doing will be acts of perceiving and conceiving of a given, a taken, and a made world, metaphorically understood with and through a socially languaged one. Language, built up from a tangible thereness of felt experience, becomes metaphorically recycled into conceptual experience that, at once and recursively, shapes perception. For instance, such understandings as “more is up” are

⁵⁴ A self as re-cognized is one to have been thought (again) into being through the mirrored neural construing of another. Being thus recognized is, in turn, that which renders the self re-cognisable (re-thinkable). One feels oneself visible, as that possibility of being rendered anew in the world through another as a tangibly thinkable one. And in turn, one experiences oneself as a re-cognising self, which is to say, one enacts one's learned capacity to reciprocate the recognition through the same neural construal of other-sense-making.

⁵⁵ The neologism “co-texturising” is used to flag that perception and conception give of the texture, the fabric of the world, and that these textures are consequence of collective being. They happen in and through the *with* signalled in the prefix “con.”

intimately tied to bodily encounters of that observed physicality (Carpendale & Lewis, 2004, notably pp. 87–89; Lakoff & Johnson, 1999, p. 51). Such recursive conceptualisations render a socially conjurable meaning of self and world as rudimentary sense of *being with*, though not necessarily experienced in awareness as such.

More questionable yet is whether or not, through language and the social, the emerging person will come to develop, a mutually supportive symphonic resonance of secure-enough bound selfhood with and in an expansive-enough world consciousness. In the grappling with this ultimate paradox are born(e) the seeds of existential anxiety, but also of vibrant possibility.

Accordingly, the thinking that I explore is one of a recursive autopoietic process of successive enfoldments of other/Other/world into (as) self and of living one's self in (as) other/Other/world—and doing so not through loss of self, but rather with a paradoxically growing consummate sense of self. It is a story of coming into a belonging and beholding of self *well* with, as part of, and alongside other originary beings. I understand this to entail what Heidegger called the resolution of Being toward self, of a responsibility for self, and of Being-complicit (Being-guilty) (as explicated in Stolorow, 2011).

Ultimately, the question must turn to praxis in considering how we, each of us and together, do engage such a grand task, beginning from our first bodily presence. To explore anxiety, the present path follows tentative understandings of coming to self. We will need to consider the role of affect and metaphor in imbuing abstract thought and language with meaning. We consider basic-level categories and how meaning is built up and down from there (Fonagy & Target, 2007b; Lakoff & Johnson, 1999). We will want

to understand something of the layering of degrees of security into the brain's emotional core (the limbic system, in particular, the amygdala) as consequence of experiences of good-enough attachment in infancy and beyond. And finally, we will be most concerned with what is rendered visible to the child in the mirror offered and availed of by the primary attachment figures of her life. But before any of these excursions we would do well to develop an understanding of play, beginning from Winnicott's notion of play as in a space that transgresses and denies boundaries, a place that is transitional, neither given of the world nor made by the self—a space of the third.

Play

Winnicott presciently wrote, “It is *play that is the universal*, and that belongs to health” (1971/2005, p. 56). He posited that “on the basis of playing is built the whole of man's experiential existence” (p. 56). In the space between the world as given and the world as made is the transitional space of play, of sense-making, and thus of self-making in and with world.

We experience life in the area of transitional phenomena, in the exciting interweave of subjectivity and objective observation, and in an area that is intermediate between the inner reality of the individual and the shared reality of the world that is external to individuals. (Winnicott, 1971/2005, pp. 85–86)

If radical constructivism posits an internally construed, made world (as cited in some sense of one's illusioning), and realism posits an externally given and potentially disillusioning one, then the transitional space—for it to remain a possibility for the play of illusion and disillusionment—is, as Winnicott describes, that neither in-here nor out-

there “neutral area of experience which will not be challenged” (1971/2005, p. 17). It is worth citing Winnicott at length in regards this transitional space. He writes:

The intermediate area to which I am referring is the area that is allowed to the infant between primary creativity and objective perception based on reality-testing. The transitional phenomena represent the early stages of the use of illusion, without which there is no meaning for the human being in the idea of a relationship with an object that is perceived by others as eternal to that being. (Winnicott, 1971/2005, p. 15)

Notably, it is Winnicott’s conception of illusion and disillusionment that I consistently refer to in this dissertation. Whereas illusion describes the pretend space of play and sense-making, disillusionment entails the work of the world and the teacher against which self-made illusions can be honed and sharpened. Though the words illusion and disillusionment come with negative connotations of too much fantasy in the first and too much disappointment in the second, I instead value both these gestures as essential complementary “teachers” in the trajectory of self-making that is autopoiesis—in short, learning.

Of the transitional object, Winnicott would give liberty to the learner to creatively illusion, that is to play in the articulations between given and made and posit conjecture freely to a world that, in time, would subsequently disillusion in ways that teach.

Of the transitional object it can be said that it is a matter of agreement between us and the baby that we will never ask the question: ‘Did you conceive of this or was it presented to you from without?’ The important point is that no decision on this point is expected. The question is not to be formulated.... [T]he mother’s main

task (next to providing opportunity for illusion) is disillusionment. This is preliminary to the task of weaning, and it also continues as one of the task of parents and educators. (Winnicott, 1971/2005, p. 17)

That is, transitional phenomena occupy a space of the third, that essential unbound place of play between and transgressing inner and outer worlds, the as-yet-unconstructed site of learning, in the co-extensive *with* of singular plural being: Play “is not *inside*... [n]or is it *outside*, that is to say, it is not a part of the repudiated world, the not-me, that which the individual has decided to recognise... as truly external” (Winnicott, 1971/2005, p. 55). Play occurs in this intermediate area “*between primary creativity and objective perception*” (Winnicott, p. 15) and the task of living well with/in that ambiguity is akin to the task of living fluidly in the paradox of what Jean-Luc Nancy (2000) names our singular plurality. Winnicott says that:

the task of reality-acceptance is never completed, that no human being is free from the strain of relating inner and outer reality, and that relief from this strain is provided by an intermediate area of experience... which is not challenged.... This intermediate area is in direct continuity with the play area of the small child who is ‘lost’ in play” (p. 18).

It occurs to me that, in the practice of human enculturation, through a fiction of absolutes and exactness in the world, a fiction poorly understood and promulgated especially in empirical disciplines such as mathematics, we make no qualms about formulating Winnicott’s question that is “*not to be formulated.*” Indeed, it is our habit to do so, as exemplified in our early insistence upon particular “right” answers—put differently: in our too-ready gesture to disillusionment. We in effect are asking of the child to *make*

objective fact, but in the manner supposedly *given* by the world; that is, the demand is to simultaneously and preemptively occupy both worlds, to eclipse any transitional space, and to act as though there could be only one such mathematics taken and made of a multiply experience-able world.⁵⁶

Learning a Self into Being: Risk and Reward

Winnicott emphasised play as creative experience—learning made possible in conditions of trust. In as much as learning is meaningful, it entails self-change as the creative shaping of self (autopoiesis) in co-choreographed movements of self-world-becoming (conditions of *being with*).

Self-change, though it be the defining dynamic of life—and thus subject to the requirement of self-renewal to ensure self-continuance—invokes life’s own paradoxical contradiction: To persist as life one must self-change *with* life such that every change is, in a sense, a failure to continue to exist—more evidently and threateningly so, where change looms greatest.⁵⁷

That said, the newborn knows not this threat. Without the shape of accessible embodied memory the infant has not the predictive capacity to contemplate its own demise. Anxieties about a future self cannot exist without first experiences of self in space and time. Instead, instinctive responses to physical discomfort drive emotional discomfort as the various neurobiological systems come online in adaptive response to a world that teaches. The newborn knows pain and cries, doing so without thought or contrivance. He is creatively free to self-construe, but by what means? And how does that

⁵⁶ Indeed, precisely this issue might well describe that which sits at the heart of ethnomathematic concerns (but that is a matter for another paper and another discussion).

⁵⁷ In a very tangible sense then, how might we consider that being without self-change enacts Being-toward-death?

infant transmute into the child of whom Winnicott speaks in terms of creative play as potentially frightening? Winnicott writes:

Playing is always liable to become frightening.... Responsible persons must be available when children play; but this does not mean that the responsible person need enter into the children's playing.... [P]laying is an experience, always a creative experience, and it is an experience in the space-time continuum, a basic form of living.... Playing implies trust, and belongs to the potential space between (what was at first) baby and mother-figure, with the baby in a state of near-absolute dependence, and the mother-figure's adaptive function taken for granted⁵⁸ by the baby. (Winnicott, 1971/2005, pp. 67, 69)

Once experiences and habits of self-in-world emerge, including a memoried past and possible uncertain futures in a variably-contentious “real,”⁵⁹ then creative self-change wants for safety-net-assurances (the confidence that another will catch us should we fall) with goodly opportunities for play as suspensions of reality (hypothetical scenarios within which to experiment). To the degree that learning mandates a perceived paradigmatic reassemblage of one's known, one's being,⁶⁰ undertaking such shifts of self entails overcoming substantive vertigo into leaps of faith. In the absence of internal ripeness-to-emergence—that is, without a near-irrepressible fulsome inevitability of “being the change you are”—and instead given to move by the impetus from behind (the

⁵⁸ Notably, the baby does not consciously “take” anything for granted or not for granted, leastwise not as a newborn.

⁵⁹ Here I invoke the notion of the “real” as that which is experientially consistent across humans. That which is real and factual, is that to which humans can agree upon at the level of the species and as both collectively construed and communicated through language. As such, a person seeing a chair where there is what “everyone else” would call a lion, is hallucinating, is missing the fact of the world, so-named a “real” world *for* humans.

⁶⁰ In complexity theory, such a reassemblage would constitute a significant phase change; that is, a significant shift in the probability space of subsequent enaction (Juarrero, 2002).

likes of a tiger about to pounce, so you must jump the ravine), then leaps of the life-threatening sort take courage, extraordinary resolve, and uncanny knowing rallied from within. Surely in the throes of anxious unreadiness, such scenarios don't typically end well. All the same, there seems an insistence on attempting to push a learner into learning.

Indeed the pressure to learn oneself into some future self, according to the precepts of another, constitutes a near lose-lose situation that might understandably fuel preemptive acceptance of defeat: Either succumb to the jaws of the tiger (accept punishing consequences of passive resistance) or step into certain demise (move through alternative other-prescribed motions). In the absence of the possibility for trust—trust enough to play at what can be meaningful to the self—the most defensible response may well be defiantly chosen ignorance, a fortification of self-boundaries and offense as the best defense. Or, at the other extreme, the self may recoil into an abject minimal existence. Either extend the bounds of self, imposing oneself on the world, or contract in an effort at self-erasure. Both directions enact a refusal of singular plural being—a denial of other or self, that effectuates the same self-obliterating consequence. How do children and adults arrive at these tenuous lose-lose positions, or how do they, nay we, avoid such arrivals? What manner of adaptive coherence and coherent adapting constitutes a self along such variable paths of being and non-being? And how can we think each as consequences of moment-to-moment fitted-enough response to the experienced world?

To study attachment is to return to the interactive conditioning of self-meaning and embodied responses of child-adult enacted invitations into the play of sense-making with world. Indeed, “attachment immediately takes center stage once we recognise the

physical origins of thought” (Fonagy & Target, 2007, p. 428). But, prior even to attachment, there are more rudimentary human proclivities to consider, these arising out of and setting the biological backdrop of emotive being upon which attachment interactions act. In Chapters 4 and 5, I shift away from the broad discourses framing anxiety in terms of lived paradoxes of being and being with and turn instead to the particularities of human being and becoming. Chapter 4, draws primarily from research on the neurophysiology of affect; that is, of emotion and feeling underpinning the why, as biological motivation to learn—the why of doing ourselves into ongoing being, especially in infancy. Chapter 5, also a “bottom up” chapter, considers the “how” of learning as understood across present literatures on infant and childhood psychodynamic development in and through attachment and attunement with care-giving adults. With these in place we will return again in final chapters to broader frames, revisiting anxieties proper in ways that might point us to different attentions and dispositions. The closing chapters ultimately drawing from contexts thus developed, broad and particular, to thinking transphenomenally the implications for teaching. For now, return to Matt.

3.5 In the Spaces (1): Storying Matt

The initial plan had been for weekly sessions to complement Matt's regular, school mathematics. We did meet weekly, for the most part, through the first summer, but once school began sessions were cancelled and added in ad hoc fashion. As it played out, his September illness had reduced our meetings in that month to two. In October he went with his family to Europe for a week holiday and so I only saw him two times that month as well. In November we tried to make up for lost time—ineffectually so, or I wouldn't now be sitting in this conversation. There were nine tutorial sessions in November. It was a pattern destined to become familiar: of school start-up illness and absence, last minute surges preceding assessment periods, and the relaxation of effort and attendance following such surges. Mom later describes "his typical rhythm. This is the time of the year [approaching a testing period] when his stress levels start to go up.... He just screws around the first part of the year and then there's a point... when he realises he has to get through" (Sonia, March 4, 2010).

And now, in Grade 10 mathematics, even with my help, Matt could not statistically pass the year. Having faced a similar predicament in Grade 9 when Matt came home with 26 percent in Term-1 mathematics, his parents had pulled him out of mathematics at school and he began anew the program of studies working through it in the evenings at home.

I had come to know Matt as a poised, but guarded, learner. He did not want his difficulties exposed. His poise was thin veneer for his not knowing. He played well with his dad. They seemed comrades. Mom could be relied on to organise things. As for his mathematical understanding, Matt presented surprises of both knowing and not knowing.

The knowing buoyed his veneer while the not knowing would trigger traumatic dissociation.

For me, for whom the sense he made from one day and moment to the next came as fickle as the wind, it was easy to wonder what worthwhile residue remained of earlier flashcard exercises and number sense explorations through which we had begun to condition different mathematical assemblages while chipping away at the fault lines of no-longer-adaptive adaptations. Like shattered illusions that insist themselves back, I feared that the summer's loosening and rudimentary remaking could not, would not, hold. I wanted more time. I felt they wanted quicker results. I feared being managed out of a space for learning. They feared stagnation in play. Warren saw the issue from a sociological perspective. Sonia saw it from a management one. And somewhere amid these tensions Matt would excuse himself, drifting unseen into a numbing enclave of Magic Cards, skateboarding, and other distractions.

I had been worried about this, from the first rumblings of the school year. How quickly did those summer forays into mathematics fade into a land of frivolous, tough to "nail down," realm of the intangible if not peripheral fringe elements of what was to be known and understood. No matter that Matt had insisted to his parents that, "What we're doing isn't stupid you know!" and no matter that my presence seemed to have immediately and enduringly displaced former temper tantrums about doing mathematics. With school, two things happened: The "real" "hard" work that counted began and Matt took sick. Between hockey tryouts, illness, and school, I saw him twice in September. Between holidays, overindulging recreational drugs, and being grounded, I saw him twice in October. This seemed no coincidence. When I did see him, he reported

understanding his schoolwork, that it was easy and straightforward. That too was no coincidence. Matt, I would learn was notoriously inaccurate at self-assessment. Again, that would also change over time. It seemed that he had no experience with which to recognise what understanding felt like. I found myself anxious to see textbooks, assignments, and work. I found myself somehow kept in the dark, in the same way Sonia described the school, held to a “need to know basis.” It wasn’t until November till the implicit and then explicit request for materials was met and the cramming to get by began. It proved too late. But still, it was not quite the final hour. Familiar refrains, these!

With school, and impending assessment, the walls had closed on the possible manner and address of our work together. Our decision to move to a distance program “delivery” made possible a second chance, a new beginning—but one to reveal itself constrained by the same debilitating fear that he could never get through in time so he had to prioritise getting by. If teaching was about negotiating allowances and prompting movement in and across a play of experience in mathematical sense-making, then the crisis of assessment pressed an immutable constraint on the breadth of such allowances and the direction of such movement.

And so it was that within these contexts, in December 2009, this researcher-tutor became researcher-teacher of sorts. I agreed to a greater commitment to working with Matt, me striving to slow us down, to bring his logic into awareness, to ask not what is wrong but how does this make sense. He, continuing to scramble to get enough right answers, was also open to letting me in. I believed he could be a David and subdue this bullying mathematics Goliath, and though he didn’t really want to stick around long

enough to find out, he might risk it with me by his side. And so, with that glimmer of perhaps foolish possibility we went on.

We settled on a modified version of last year's approach—given (and assumed) as the sole option. We would follow, from start to finish, the provincial, distance-learning program under the supervision of the local district. Sonia would synchronise our schedule to the school timetable and would deliver Matt to and from my place for “class.” As such, he would continue to have mathematics every other school day and at roughly the same time as before. In other words, we would be using the remaining half-year of teacher-student interaction time to begin and complete a full year of course work. Moreover, what had once constituted supplementary tutoring sessions would be eclipsed by core curriculum ones.

This would not be easy. Matt had had a long-established relationship of strategic avoidance when it came to homework. I would come to appreciate full well what it meant in the best-case scenario when he reported having done his homework. That meant having scanned the exercise for the simpler-looking questions and only there, putting pencil to paper, entering values or words with the mindlessness of busywork. Yes, I could count on him to attend carefully to all homework expectations at the end of a lesson, and to behave in manner that compelled my fulsome belief in his intention to complete the work. Yet the same homework repeatedly returned as a mostly white expanse of incomplete, unattempted, and under-thought exercises that he fully expected we would leave behind. For Matt, homework meant going through motions and gaining permission to move on.

For me it meant something entirely different. Together we would revisit again and again, braving the difficult places. Then, I would repeat my reminders for him to take learning advantage of lesson exemplars, comprehensive answer keys, and my help. I tried to eliminate his excuses, to enlist his parents' help, and to more clearly organise expectations for him. I even told him that if he arrived without his homework done I would send him back home. Which I did one day, much to his parents' chagrin. Even that was to no ultimate avail. His parents were at first decidedly unsupportive of that little manoeuvre. Apparently it had been tried before. They were however pleasantly surprised at Matt's positive reaction. Unfortunately the effect was short-lived and I did not want to invite conflict with his parents yet again. I resolved to expect little improvement in the homework department and concentrated on our work together.

Without condoning it I framed my approach to the above peculiarity as evidence of a kind of understandable passive resistance, if not passive aggression, directed not at me, but rather at the intimidating bully that mathematics had become for him. Without an ally at his side, he would dissociate from the psychic risk. Anything to do with thinking through mathematics homework quite simply and reliably slipped his mind. He had indeed adapted to this strategy of getting past but not through a mathematics that was excruciating reminder of what he was not. And though, in the typical onward march of program deliveries, getting past would have been the norm, it was surely not one I ascribed to. I would not allow it, so return we did. The going would be slow and definitely non-linear.

Sadly, the prescribed approach we were about to enter into also left little room for imaginative exploration anywhere anytime. Indeed, the program package comprised a

highly structured, page-by-page sequence of detailed procedures—explained and practiced. It came complete with built-in evaluative checks and balances meant to ensure the protocol was being followed. The program of studies was parsed into four modules, each composed of three to eight sections, each section made up of two to twelve lessons, and each lesson composed of narrative explanations, worked examples, student exercises, and detailed answer keys. The documents were massive and their completion subject to auditing. Students were expected to work their way through the explanations, complete the exercises according to the worked examples, and check both their work and their answers against the answer key. At the end of each section of lessons students would complete a culminating assignment and submit it in a timely fashion to the district for grading and feedback from their assigned teacher-marker. Once all the culminating section assignments for any given module had been thus completed, then someone would notify the district to schedule a module test and the student would come in to write it. The student had one calendar year to work through the program, write the final exam, and successfully complete the course. A meeting could be arranged or emails exchanged with the assigned teacher-marker if the student wanted to take advantage of the help available. Sonia undertook to liaison with the district in all of this. She would get course material to me, hand assignments to them for grading, and schedule tests for district ministrations.

As I was about to discover, the teacher autonomy that I had enjoyed over my past years of experience, would be severely curtailed under such a regime. In effect, three players could each exercise potentially conflicting last words: Up close, I had first dibs on shaping what play there was in the mathematical encounter; the district had the final word on the means of evaluation; and on behalf of both parents Sonia regulated the pace

by scheduled tests and submitted assignments in order to be on track for a June final exam date. Though all parties espoused a common goal of seeing Matt into responsible ownership of his life and the present situation, we each held different views on the nature of that situation, on the meaning of ownership, on his present ability to respond well on his own behalf, and on the strategies we might take to provoke these possibilities.

Working closest with Matt, I would continue to prioritise effortful sense-making as means to self-efficacy and presence with mathematics and in world. I trusted that measurable achievement would follow as secondary consequence. The district concerned itself with the tangible end-measures of such achievement; and Sonia pressed for timely progress, skipping sections as needed in order to get to and complete summative assessments on time. It would be tricky, to say the least, navigating a functional-enough coherence across and through the inevitable tensions. The common thread, or was it the site of threaded entanglements, would meet in Matt.

As it played out, caught in a confusing undercurrent of differences, he, in one sense, would manage the incoherence by excusing himself from it. To be sure, with my appearance, another determined woman had entered Matt's life—purportedly to work with him on his behalf. It could definitely get complicated. Interestingly, the longer we three parties went without meeting, the greater was the unknown chasm across which to trust. In contrast, each face-to-face conversation between parents, the district marker, and me ushered in renewed confidence, comfort, and a meeting of minds to buoy next steps. Without such discursive encounters, Matt and his visible progress (or lack thereof) was left to speak for itself, doing so through his anxious absence.

In retrospect, our own partial histories could not but condition the tensions and ambiguities of the situation. Our positions were each held with deepest conviction, firmly embedded in life-honed conceptual networks, rooted to our affective unconscious knowing, and enacted according to each of our peculiar, embodied biases on how to fittingly be, know, and act in the contexts of schools, teaching, and learning. In these regards, it really didn't seem to matter how educated or not we adults were, nor how well schooled in the machinations of Western systems of education. As the adults in his world, were first and foremost powerfully agentive in our own right but also fallibly human in our needs, wants, and desires. With as much subtext as this going on, I could make sense of Matt's self-dismissal from schooling and mathematics, as not his and surely not of his concern. I could understand his motive to "excuse" himself, to choose complacent withdrawal over agentive ownership. In Matt's own words, used in the context of avoiding one rather onerous-looking homework question: "Why would I try that? That would be like picking a fight with a bully." Indeed!

From his parents' perspective, the path to ownership in Matt's context meant somehow sneaking by this critical giant, gatekeeper of higher learning and future opportunity. They granted that *getting by* mathematics would unfortunately entail some degree of *working through* it. In this way, understanding though important could only be secondary to passing. Venturing too far beyond what was "good enough to get by" risked leaving Matt too-long mired in what a decade of past experience had defined as debilitating battle. It is no wonder his parents advanced a pragmatics of accepting shortcomings, cutting losses, and moving on. The Matt I first met and with whom I had

begun to work six months prior certainly enacted an implicit endorsement of that strategy. But things could and would shift.

In all fairness, from a parent's perspective, it is one thing to muster one's considerable adult resources to face an ominous battle. It is quite another to bear witness to the struggle waged by, and upon, your child. Both formidable professionals in their own right, these parents' successes, in and of themselves, could constitute a compounding challenge for any child to live up to.

Like many a quick fix, unaddressed disconnections and incongruences had a way of compounding upon themselves over time. For my part, I conducted my fair share of pushing back on the demand to perform on cue. Consider the following email exchange:

Sonia: (March 3, 2010) Some adjustment needs to be made. And a schedule needs to take into account Matt's completion of the assignments and taking the tests on each module.... He didn't complete all of the lessons in Sections 1 & 2 and that's fine, but should he be asked he will need to provide those.

I think the slow start has been helpful for Matt, but agree with you that the pace needs to be picked up, both to create momentum and simply to be finished in time to take the provincial exam. With the end of the school year looming he seems to be a bit more focused.

Given that he won't be coming on Friday, I think it would be great if you got him in a mindset of working on his own on Section 3.

Lissa: (March 3, 2010) Lots to talk about tomorrow. All of section 3? I don't want to set Matt up for more bewilderment. He needs success. He is finally tasting understanding and possibility. He can't go zoom... as much as he would like to.

It will hurt him. Who he is and what he can be is too precious. Let's see what we can come up with tomorrow.

Indeed, one could think Matt caught in the cross-fire of two strong women—each respecting the other, but each espousing and strongly enacting different views on managing Matt's best interests at the intersection of mathematics, learning, and achievement. What room could be held for his own agency and ownership in such a “set up?”

Ultimately, I had found that across the trajectory of time working together, the euphoric ups at times seemed frighteningly too short-lived and nebulous, despite their growth with certain irregularity. They contrasted sharply against the threat of cataclysmal downs. Such is anxiety. We might even suggest that at times a numbing state of dissociative denial was the coping strategy of choice. Having entered this dynamic with the romantic vigour of a newest player, I had soon felt the weight of anxieties, beliefs, and awarenesses hovering in the air and conditioning the decidedly rich, deconstructed worldviews, under which this child had come to know himself as a learner in schools.

In any case, one hears in the December (and repeated in March) audiotaped interviews the presence of a defining tension. It hung like a question in the air, not to be asked nor answered. As adults we become particularly adept at maintaining self-coherences, protecting our psychic selves from the very self-elements most likely to be rejected. We are experienced in enacting a game of “not me” as unspoken, but ever-lived refrain. I often wonder to what extent such expertise in maintaining self-coherence by extricating parts of self, is borne upon youth with only fledgling boundary defenses.

I admit my share of complicity. For my own “not me,” the one I adamantly defended against, I worried that these parents viewed the somewhat leisurely, enjoyable pace of last summer’s work as having paid little in terms of dividends on investment. I scoured that history for reassuring answers to my own unvoiced questions: Was I too enamoured with contextualising mathematics historically? Had the exploration of different number systems really contributed to his understanding of base 10 or had it merely been confounding, no matter that it had been playfully and enthusiastically engaged?

There was the tedium of bringing him to my place and picking him up, of cooperating with the drills and what could be thought unrelated games I’d sent for them to engage, the reportedly hearty and playful work and its seeming contextual distance from what occurred at school, the crescendo of scrambling through November, and now the reality that he was failing miserably. We were a group well schooled in living with, even masking anxieties and tensions. Perhaps it was just as well that Matt was downstairs because it felt to me that we were not naming the underneath parts that worked him. Some difficulties are best left alone, or so a wisdom of repressed affect goes. In any case, for the time being, we were ill-positioned to address the difficulty and opted for letting it fester a little while longer (one might suppose), perhaps erupting unexplained in elsewhere places, until one felt the fortitude, gumption, and resolve that one had no choice but to deal with the consequence of waking “the sleeping dog that lies”.

4 Motivating Processes in Human *Becoming*

We enter now a chapter about emotions—which we emote and which move and motivate us into doing ourselves into unique trajectories of becoming at the meeting of self with world. The chapter reaches back to beginnings, doing so in a sincere effort to enable a robust-enough, foundational understanding of sense-making that will subsequently serve in making a helpful sense of Matt’s encounters in mathematics.

When I say beginnings, I do mean the very rudiments of physiology of mind and body that occasion a neonate to self-organise, mind in body, from diffuse neural networks of mind through bodily engagements with other and world. Bear with the journey. I believe it necessary to developing a fulsome and agile understanding of all that is present, emergent, and at play in the anxious learner we encounter in Matt.

The chapter is organised in three parts. The first section, “Principles of assemblage and disassemblage,” explicates the biological mechanisms of neural organisation as prompted by co-occurring strapped together sensations of world and the felt neurochemical rewards of “a-ha” moments of structural organisation. We encounter the possibility opened in disassemblage as necessary precursor to creative reassembling, escalating as we become more fixed with age, and the value of “huh?” moments of cognitive dissonance that press disassembling reconsiderations. And we consider the precious role of language in bringing unformulated experience into particular realms of cognitive awareness.

In the middle section, the discussion moves to emotions and feelings proper as prime motivators. We will explore the all-important fundamentals in teaching and learning, of conscious awareness and attention, both across present moments and then as these

come to be memoried forward. Finally, I develop the role of curiosity in exploring a world whose givens are experienced in varying degrees of contingency with our own agentive actions.

All of these foundational discussions are given to inform, in the final section, a sense of what it is that serves or fails to serve a learner, for example Matt, in terms of his attention and self-negotiation through “huh?” and “a-ha” moments. What motivations underpin his anxiety and are silenced by it? What missed bodily sense has conditioned current miss-takes in understanding mathematics? And finally, what might we learn from the good enough attuned parent about bringing Matt back to himself, into and with the manifold of singular plural being and belonging in a shared world?

In his foreword to the 2012 text, *The Archaeology of Mind: Neuroevolutionary Origins of Human Emotions*, a rather expansive and ominous volume, Siegel encourages the reader to persevere. He writes,

This book... offers teachers a unique opportunity to understand the deep circuitries of motivation, emotion, and learning at the heart of the educational experience. When we realise that teacher–student relationships are based on trust, we come to see that these subcortical circuits set the stage for an effective learning relationship. (2012, pp. xxvi–xxvii)

This chapter shares that same purpose. I start by exploring the literalness of mind in body.

Mind is the experiential entailment of physical being (Edelman, 2006, especially p. 40; Thompson, 2007, pp. 128–165). A given moment in any human life’s self-experience expresses a location along an evolutionary path of emergences co-occurring at

four scales of inheritance and adaptation: genetic, epigenetic, behavioural, and symbolic (Jablonka & Lamb, 2006; Thompson, 2007, pp. 166–218). The newborn arrives with extensive genetic and epigenetic determination as particular gene expression, already in place (Leckman, Feldman, Swain, & Mayes, 2007; Shanks, 2007). Uncountable system decisions extending back in time, to and through originary planetary beginnings, have led to the event of a particular zygote’s becoming. In the throes of this ever-coevolving symphony, an embryo’s localised waxing into self and life enacts a becoming of potentialities and malleabilities of species and cell amidst and with the occasioning interweave of predisposing contexts physiological, social, and cultural, these in turn bringing their own conditioning potentialities and malleabilities⁶¹ (Donald, 2001; Jablonka & Lamb, 2006; Maturana & Varela, 1980, 1998; & Thompson, 2007). Thus, already by birth, the expression of a protein-encoded genotype, like a musical score, has been played into an emerging phenotype—some parts mutable, others less so—according to reflexive orchestral interpretations of a co-adapting embryonic-uterine milieu (Leckman et al., 2007, pp. 101–102), itself enveloped within larger frames of influence from mother through familial and communal systems all the way up to bioculture and world (Donald, 2001; Jablonka & Lamb, 2006; Maturana & Varela, 1980, 1998; & Thompson, 2007).

Accordingly, with Gergely and “numerous others... [I assume] that the infant’s innate ‘constitutional self’—that we could equally refer to as the ‘biological’, ‘temperamental’, or the ‘true’ self (see Winnicott, 1971/2005)—has a richly structured internal organisation from the beginning” (Gergely, 2007, p. 58), but yet one ripe with

⁶¹ See below, Leckman et al., 2007, & Strathearn, 2007 for details at the neurophysiological level of both mother and fetus and their mitigation in social context and circumstance.

turbulence and possibility not yet formed. The ordering that exists owes to the fact⁶² that the fetal neural network will have taken on rudimentary dispositions in response to experienced regularities and disregularities in uterine environmental conditions, including maternal-fetal material exchanges (Leckman, et al., 2007). That is, it will have, from the beginning, been learning itself into being, literally in/formed through first lessons of resonance—of new self in and from other, the parent self, who is likewise nested in and as the with of life. Thus witness co-occurring gestures—*from, with, and into*—made

⁶² Recall that “indeed” and in “fact” share common, and I believe non-trivial, etymologies that support an embodied cognition (or enactivist) position of being as doing as knowing. When I invoke the expression “in fact” I am conscious that such facts are elicited and constituted “in deed”. Moreover, I invoke the concept of “fact” as encompassing such notions as are agreed upon at the level of human species. That is, facts are those named world occurrences about which there is collective human resonance in perception.

Science resorts to the use of technologies in efforts to reduce subjective reconstructions (thought as localized biases) of perception. Like systems of jurisprudence, it attempts to get at “the facts” by standardising that which is seen, heard, felt, tasted, smelled, and then communicated. Notably, science proceeds in a way that is particularly adept at marking perceived elements of world “as fact” and it does so in as much as it attempts to restrict “data” to sufficiently *consensual* observations, where *con* names the “withness” and *sensual* re-minds us that we are agreeing on exteroceptive sensing, languaged via a particular “sciency” discourse.

By sciency I refer to the discursive effort at removing subjectivity, which is to say covering it over—especially in terms of explicitly avoiding overt use of certain forms of persuasion, rhetoric, and metaphor, that would be deemed, non-literal (See “Steven J. Gould, 2003, for an explication of the development of this genre of discourse that I am calling sciency. Of course, see Thomas Kuhn, 1996 for a seminal interrogation on the nature and legitimacy of scientific license to “objective truth”.) Rather, sciency discourse employs covert strategies, for example, passive sentence structure and a pervasive affordance of “givens” as unquestionable fact—a practice that promulgates the illusion of omnipotent access to a “real” while neither localising nor owning that illusion’s “creator”. It is as though the subjective goes underground or rather works from a hinterland of marginal selfhood. We hear, “according to science” and this is brought to unwittingly legitimize, in the service of deeply troubled and festering elements of the unconscious, even such abominable enactments the likes of mandatory sterilization and ethnic cleansing.

It is not the practice of science that causes me great discomfort, it is rather the certainty with which it is invoked—a prevailing attitude of preferred blindness to the problem of self-opacity and a subsequent denial of the existence of unconscious motives. In science, it would seem, a strange ignorance becomes legitimising bliss. Its lack of acceptance that it too is a story-teller.

In this present work, I weave a story, not any absolute truth—only a story that I hope can be helpful, ultimately to those in pain, perhaps because I am moved in this to ease my own childhood pain and I am bound to do it by picking up shiny scraps of the possible from a veritable mounding accumulations of recorded stories in science and elsewhere—assembling these according to the worked wisdom of an uncannily playful unconscious (the present footnote being one case in point of such breeches effectuated by the unconscious into and through worded world-making).

possible in learning: the *from* of physical decoupling and the *with* of coupling differently according to resonances that allow a construing of other-in-self, throwing self *into* world. And so, it comes to pass that by birth, a particular irrevocable ontogenetic path has already been laid in walking. That path, historied in new infant being, necessarily enables and constrains what futures may be had.

Principles of Assemblage and Disassemblage

Life's general proclivity to assemblage.

Cell collectives orient according to coupling, decoupling, and recoupling events, doing so in concert with the multicellular organisms they compose. Entrainment (Juarrero, 2002, pp. 115–116)—a ubiquitous kind of parallel coupling that synchronises life forms into collectives (think flocks of birds shifting in unison)—physiologically also organises the cells of multicellular beings. Indeed, entrainment characterises the behaviour of like cells such that, for example, heart muscle cells come into their being *learning* to contract and relax in apparent rhythmic unison. Or, for another example, consider the neural ability to sustain impulses: Despite physiological all-or-none periodicity of nerve cell firing (this owing to the need to reset action potentials) nerve collectives come on and off line in bundles of staggered synchronicity such that continuous experienced acts can be sustained.

Characteristic of all kinds of minds, not only those human (Dennett, 1986), the principle of entrainment enacts itself in the brain according to a neuroscience adage of, “*Neurons that fire together wire together* [emphasis added]” (Edelman, 2006, p. 28). Of particular note, in terms of consciousness: Multiple and different neural sensations—manifest to and by brain and experienced as mind—if sufficiently co-incidental in

register and habit, prompt subsequent synchronous re-firings. *That which co-fires—consciously, unconsciously, and non-consciously—conditions the re-firing of the co-experienced associative networks created in the first place. This is the physiological basis of habit.* It occurs because prior neural firings leave residual effects that abbreviate the subsequent distance to threshold potentials. Moreover, the rate of dissipation of these effects is temporally marked by a regularity across cells that makes more likely future synchronous repetitions. Put differently, a nerve cell needs a recovery time before it can fire again. Where bundles of nerves have fired together, they are more likely as a collective to “remember” to fire together again because they will be ready for re-firing “at the same time”—the ebb and flow of their thresholds having been brought into synchrony by an initial collective firing. Of course, over time and disuse, this tendency will “atrophy”; that is, if not reactivated “in time,” the nerves will have “forgotten” what they learned together.⁶³

Neurons that fire together, and by consequence “wire together,” can be proximal or distal in spatial relation to each other, and like or unlike in function. The coordinated co-firing of *proximal, like* neurons prompts neural bundling that creates a learned capacity for *amplifying* the overall strength of a neural transmission. This might be felt, for example, as a learned acuity for particular subtle environmental stimuli to which one has become attuned, or another example might be an ability to rally a stronger muscular

⁶³ Note that the neurology being described here is non-controversial, leastwise in terms of scientific discourses about the brain. Rather it is part of the given stock of knowledge fundamental to current understanding of brain function. As such, in this paragraph and the subsequent one outlining the phenomena of entrainment and reentry, I draw a summary of relevant material rendered out of multiple sources. Of the reference list collected here, the beginning chapters of Edelman (2004, 2006), Damasio (2003), and Daniel Stern (2004), in that order, afford the most accessible introductions.

contraction on cue. Of course, given that the brain speaks mainly to itself, most of the neural effects occur in a hum of activity outside conscious attention.

On the other hand, the coordinated co-firing of *distal, unlike* neurons prompts the assemblage of associative networks, where distant brain regions co-fire in a way to bundle various aspects of experience into a gestalt whole. Associative networks condition unconscious associations that, like a palimpsest, overlay prior meanings into present contexts.

In these biological processes, life systems effectuate resolutions of disparate ambiguity because they “learn” recurring co-occurrences into clustered wholes—this arguably comprising the physical and experiential essence of sense-making as relating parts into, as, and from wholes. In any case, the combined effect of both the co-firing of bundled proximal neurons and the synchronous firing of previously co-occurring distal ones—a phenomenon termed reentry⁶⁴ (see also Footnote 11)—is to strap multiple elements of experience into single gestalt-like wholes in time (Edelman 2004, 2006). Reentry expresses the neuronal synchronisation of different yet co-occurring sensations (for instance, hearing and seeing someone speak, but experiencing these things as of a single piece). Accordingly, reentry describes the neural tendency to bundle differences into the character of textural oneness, such that our conscious experience of the world traces a singular path (see below from D. N. Stern on the “present moment,” 2004).

At the same time, entrainment describes the mimetic strengthening of neuronal signaling through like firings into reticular formations. Here sameness is bundled into

⁶⁴ Edelman (2004) defines reentry as “the dynamic ongoing process of recursive signaling across massively parallel reciprocal fibers connecting maps. This process results in binding and is the basis for the emergence of consciousness.... [It a]llows coherent and synchronous events to emerge in the brain; that is, it is the basis for spatiotemporal correlation” (p. 174).

strengthened signal. In tandem, these neuronal habits of entrainment and reentry work a cumulative strapping of co-experienced sensations that are the physiological counterparts, generative of resolutions-of-ambiguity (experienced as heuristic “a-ha” moments). Progressively the physiology of these activities effectuates a hierarchical, fractal, organisational structure of increasingly sophisticated sense-made as also sense-making in a brain that most notably “speaks mainly to itself” (Edelman, 2006, p. 20).

In a commentary on Gergely’s “The social construction of the subjective self” (2007) Leckman summarises the interplay:

[Neural] synchronisation with phase-locking and frequency stabilisation can be seen as a resonance phenomenon of the brain. Selectively distributed oscillatory systems of the brain exist as resonant communication networks through large populations of neurons, which work in parallel and are interwoven with sensory, motor, cognitive, and emotional functions (Buzsáki & Draguhn, 2004; Llinás, Ribary, Contreras, & Peedroarena, 1998). (Leckman, 2007, p. 88)

In turn, and significantly so, these neural synchronisations appear to enter conscious awareness⁶⁵ according to an affective logic that, itself, marks the salience of instances, thus rendering possible the experience of time’s passage.⁶⁶

Marking time: Affecting temporal assemblage.

Interestingly, just as we experience a visual field, of-a-piece—and this despite at least 33 different visual centres registering qualities of that field (Edelman, 2006, pp. 20,

⁶⁵ See Edelman for a summary of these processes, especially reentry (2006, pp. 27–30) and in relation to consciousness (2004, p. 56).

⁶⁶ The Greeks had two words for time, *kairos* and *chronos*. Whereas *chronos* comprises a metronomic measurable time, *kairos* points to the timeliness, the thickness, of each moment—as fleeting, fecund, indulged, rife with opportunity for the seizing, and so forth.

32; Ramachandran, 2004, Chapter 2)—so too, we retrospectively smooth sequenced micro-moments of conscious awareness such that *kairos* (i.e., the ebb and flow of saccadic, thicker and thinner experiences of time) comes to us construed, in hind-thought, as coherent, smoothly transitioning, and measurable (i.e., as *chronos*, see especially D. N. Stern, 2004, pp. 31–41).

Kernberg’s “The destruction of time in pathological narcissism” (2008) contrasts objective and subjective senses of time. Our experience of time is made possible and accentuated according to meaningful investment. In early years, when all is new, myriad competing sensations overflow the time and space of experience. Consciousness is lantern-like, the brain is maximally plastic (Gopnik, 2007, pp. 503–504), and time seems infinite (Kernberg, pp. 299–300). Recurrent experiences gradually become the learned habits of the sense made of sensation—especially exteroceptive sensation, and to a lesser degree interoceptive and proprioceptive⁶⁷. We make sense of sensation—that is, we come to name, order, and thus know it in common ways—according to the shaping influences of language and culture.

Notably, the neural chunking of experience in time and space serves the effect of contracting experience (Kernberg, 2008, pp. 300–301). The world of our maturing mind comes to us as increasingly ordered and interconnected according to the neural organisation that the evolving, languaged brain imposes upon perception. Thus, with development, consciousness assumes an increasingly spotlight focus as the brain crystallises (Gopnik, 2007, pp. 503–504) and time, construed of moments experienced, in

⁶⁷ Interoception names internal physiological sensing (e.g. hunger pangs); exteroception is external physiological sensing (e.g., pressure felt on the skin); and proprioception describes the sensing of the relative positions of one’s body parts (e.g., that an arm is bent or straight).

retrospect seems less and less to have moved (Kernberg, pp. 300–302). In counterbalancing measure, a meaningful life—a life pleasantly indulging waves of affect—affords opportunity for engagement in moments and memories that tease time and space into myriad components (Kernberg, p. 302). Drawing from his life work with pathological narcissists and considering the erasures of the present effectuated by unresolved traumas, Kernberg describes how, in those individuals suffering post-trauma, unconscious reverberations of past stresses consume and obliterate present life such that time seems to stand still (p. 304). As he puts this contrasts with the experience of those who age in relative emotional health where “the more significant the investment in meaningful and gratifying relationships and activities, the more the moment seems to fly by, but, by the same token, there grows a sense of time having been lived and an enrichment of the total life experience” (p. 300).

In *The Present Moment*, D. N. Stern (2004, pp. 31–41 for a summary) explores the assemblage of sequenced gestalt-like micro-moments of conscious experience in adults. These micro-moments are chunked, temporally dynamic, phrases averaging 4-second at a time, with a range of 1 to 10 seconds. This range expresses the limit that a neural resonance can be “held in mind” (p. 41). As shall be developed below, a *potentially memorable present enters consciousness because it is to some degree affectively poignant* (see Damasio, 2003, below). Noting that particular practices of awareness and attention can to some degree overlay poignancy and regulate attention (pointing it or creating a generalised accepting state), without such intentional efforts, in the course of everyday experience, as D. N. Stern points out, “a subjective experience must be sufficiently novel or problematic to enter consciousness and become a present

moment.... [T]he present moment carries an implicit intention to assimilate or accommodate the novelty or resolve the problem” (p. 34). A perceived violation of expectancy—that is, a break in ordinariness (a “huh?” moment)—brings attention and intention on-line. *Our minds/brains are structured-determined to discern and attend to notable ambiguity (“huh?” moments) and then seek to resolve these (“a-ha” moments).* Thus, attention—as conscious, remembered awareness after-the-fact (see Donald, 2001, pp. 200–202)—becomes the felt experience (the qualia) entailed of particular executive neural functioning (see Juarrero, 1999, pp. 209–211, for detailed examples of how this plays out according to a dynamic systems perspective).

Put differently, the moments we inhabit and have the potential to remember (re-experience in mind) seem to be those rallied into consciousness by an executive neural function reacting to re-equilibrate felt shifts in ecologies, internal and external. For example, I can be driving home listening to the radio and thinking about supper when a ball rolls out in front of the vehicle. The surprise of the ball will trigger a neurochemical jolt and my attention will immediately shift to adjust to the change. Likewise in different circumstances, my conscious attention might move to internal dynamics if, for example, my stomach starts to “growl.” Present moments are interspersed between unremembered ones, but in manner as to fill in the spaces of the unremembered. As such, episodic memory, memories of events, are constituted of apportioned memoried moments, strung together to fill the gaps and complete the narrative into a memorable, unbroken whole. D. N. Stern likens consciousness to a bird flitting from branch to branch where the moments perched upon any given branch constitute presence and the flights in between are lost outside experience and conscious retrieval. We fill in missing moments in the same way

that we fill in the missing spaces in, for example, our visual field despite there being a blind spot. Thus, the experience of continuity in time, as in space, owes to the brain's habit of completing patterns, seeking out closure, and avoiding gaps (Edelman, 2004, pp. 36–38).

Creative undoing: Life forms must disassemble.

As crucial as assemblage is to meaning-making, sense-making, and the construction of coherent experiences of self, neural autopoiesis must involve disassemblage—the more so with age, lest maturation and solidified connectivity elide into overly-fixed trajectories and mindsets. At the physiological level of the brain, as important as constructive phases be, the phases of undoing, cross-linking, and coupling differently—occasioned by the partial loosening of neural connectivity—together with the phenomena of drift in repetition,⁶⁸ make possible altered trajectories, creative difference, and unpredictable assemblages thought of as “new.”

Our planet is one of cascading limits all the way down. All cannot be assemblage. And in disassemblage inheres possibility beyond limited and limiting beginnings. For example, it was once near-canonical thought that during “offline periods—sleep in particular—the pattern stamped in by experience” was replayed in a manner to stabilise learned patterns of neurocellular change. But, the past decade of research has seen increasing evidence that during sleep, synaptic linkages loosen (Tononi in Castro, 2012),

⁶⁸ See Edelman (2004, 2006) on degeneracy, ubiquitous in life. Degeneracy is “the ability of different structures to carry out the same function” (2004, p. 154). In a sense, it speaks to the interchangeability of parts in a life system. Together with drift in the system—where drift names slippage in the components that collectively perform a function or instantiate a collective “habit”—there exists in a biology of performativity regular instances of interruption as introductions of difference. At a less notable level, degeneracy and drift are the reasons why, though I might “perfect” my golf swing on some rare occasion, I have to work at maintaining that “perfection” and functionally never can succeed.

enabling the creative plasticity inherent of neural disassemblage. As it turns out, sleep seems not only to contribute to the solidifying of recent memories, but also to the relaxing of “neural connections throughout the brain to put this organ back in a flexible state in which learning can take place” (Castro, 2012, p. 44). The ebb and flow of day and night, in sense-making and sense-loosening, willing and allowing, tightening and relaxing, are the felt experiences of these physiologies.

And so, the autopoietic trajectory, in terms of becoming in a *with* of the world (and as is customary of healthy organic life-tracings), is an uneven one. The false starts and miss-takes, made evident as such by a world that disillusiones, prompt a dismantling and *partial re-taking* of self and world, but a world illusioned differently—*partial* because such illusioning is not taken impartially, and only *partial re-taking* because life, to be life, moves in the direction of assemblage: Going back to “square one,” for any self, is physiologically not possible. Though deaths and births seem to effectuate endings and new beginnings, they do not permit of the replication of steps. We mark time’s passage by our embodied difference (Lakoff & Johnson, 1999, Chapter 10, especially pp. 167–168). The endings and beginnings of life express the waxing and waning of iteratively taken passages—variations in cadence and tenor of far-from-equilibrium assemblage and disassemblage under the umbrella of a constraining planet. Though horizons may stretch to infinity in all directions, emergences express a directionality that is constitutional of our experience of time.

In general then, the construing activities of the brain cannot be confined to structural coupling alone, else we would, each of us, be on irrevocable, accelerated paths to crystallisation and too-quick rigor mortis (signaling impending decay and earthly

return, though never in the same “river” twice). Adaptability inheres in fluidity—a continuity of discernable shifting coherence, as existence, somewhere between the heat of raw energy and the frigidity of absolute zero. Life forms, as shifting repositories of semi-organisation are on irregular trajectories of assemblage, in co-adaptive response to the disassembling ruptures given of ecologies within and without. Patterns of decoupling, fragmentation, disassemblage, and dispersal are as necessary to creative being as growth and assemblage. Enacted capacities for adaptive and iterative self-reconstructions constitute learning and define life, specifically the autopoietic character of life, in all its glorious possibility. We grapple with existence somewhere between doing and undoing, without becoming undone—until of course, we *are* done, as selves at least (our bodies succumbing to the decomposing energies of life’s incessant uptake). The point of human anxiety may well reside ultimately in our discomfiting awareness of the inevitability and unpredictability of that undoing.

Within the self, and manifesting of uncanny ingenuity of mind, is this capacity for iterative undoing and redoing while still retaining a self. It is an ingenuity that makes possible extended, fluid self-continuity in the co-emerging *with* of a likewise ingenious world and universe. And it expresses itself as structural organisation able to partially re-trace a path—an odd kind of time travel where a future self, performs a selective undoing to step back, but forward, into a differently-made past-self to reiteratively re-make of it a differently imaginable future. *Within histories are writ futures, but never in stone.*

The educative relevance, here, is that the self assembles itself in a patterning of take/miss-take, illusion/disillusionment, and tracing/retracing—the re-iterative cycling of which, echoes in the rhythmic habits of sleep and wakefulness: Moments of dream-like

associative forays oscillate with decisively alert attentions to a delimiting world. The mysteries of the brain's proclivity to autopoietic feats entail, at least in part, in entrainment and bundling but also in loosening the ties that have been thus bound. Notably, in the ongoing practicality of the everyday, a highly plastic brain, immersed in the socio-cultural flux of collective being must effectuate its undoing "on the fly," being supported in that process and trusting appropriately within the limits of self-coherence. And so it is that we suffer—at times the pain, at times the exhilaration of—our own disassembling and dismembering, as a leap of faith across risk-of-self, into a promise of increased vitality and fit. Such learning, of the sort that asks for something other than amassing more of the same, can be frightening and difficult. Even more so with age.

With increased self-coherence borne of the sedimentation of lessons learned, new learning, as adjustment to newly revealed miss-takes, becomes potentially fraught—riddled by the greater risk and resistance entailed of a body increasingly rigid and brittle. The loss of elasticity in aging skin is apt metaphor for the loss of physiological and conceptual adaptability of the aging body. Too long on any particular path before realising the abrupt ends to which we are pointed, and it becomes all the more difficult to forge new trajectories. Indeed, this is especially the case when the refashioning of the self by the self takes us through unruly, untraveled, even treacherous places as we engage a long reiteration begun with undoing—our undoing—to open the possibility of doing differently again. The point of trust in autopoietic self-making is ultimately entailed in the question: "*How much dissonance [can] you... create and still resolve the harmony, because the greater the dissonance, the more intense the resolution* [emphasis added] (Benjamin, 2005, p. 200)?"

Benjamin advises, “Movement is what makes it possible to hold a tension, like that between subjective and objective awareness” (p. 198). The kinds of resolutions that make difference possible, according to Benjamin (and I agree) are those born(e) of knowing and indulging tension, rising on a crest of anticipated resolution, that moves just outside debilitating anxiety’s reach. In the holding of such tension Benjamin describes movement across poles, in a space of thirdness that is neither dissonance nor harmony (p. 198), but rather exists as just-tolerable unease, or heightened acuity, on this side of contrapuntal resolution. Taking a shorter view on autopoiesis, the movements of doing and undoing work a lived tension to enable creative difference in the minutia of moments of being.

How might such creative difference be thought to interrupt the performative pull of which Butler spoke? In particular, I wonder about interruptions to the performativity of culture, humanity, and life itself; that is, creativity as autopoietic gesture⁶⁹ enacted of singular-plural selves that would otherwise meet a *Groundhog Day* (the movie,⁷⁰ Albert & Ramis, 1993) demise of being interminably caught in the whirling eddies of self-interpellated sameness.

In writing about writing itself, Benjamin interrogates the tensions of doing and undoing (2005)—the creative effort she undertakes in writing and upon which she parenthetically contemplates. Drawing from indigenous frames, and speaking of “the

⁶⁹ Here, creativity could be thought to take a role not unlike that of Butler’s “drag” (as subversive act described in *Gender Trouble*, 1990 & 1999, see also Chapter 3 above).

⁷⁰ In *Groundhog Day*, the protagonist awakens each day to relive the same groundhog day. No matter how he changes his actions and redirects the unfolding of that day’s events, the next morning he finds himself returned to the beginning of the groundhog day, again.

One” (and its “Big Energy”) in ways reminiscent of Nancy’s originary singular-plural-being (2000), Benjamin eloquently observes:

The act of creation demands of the creator: How far do the strings that tie you to the One stretch? How far out can you lean? How centrifugal can you be and still feel the elastic tension of the energy that pulls you back to the One?... [Do] we have the confidence, as we always do when listening to Bach, that, no matter how far out he swings, he will always return us to his theme[?] (p. 199)

Describing this tension as between reason and imagination, Benjamin recounts Freud, he, citing Schiller:

The difficulty in writing proceeds from the constraint imposed by your reason upon your imagination. . . . It seems a bad thing and detrimental to the creative work of the mind if Reason makes too close an examination of the ideas as they come pouring in—at the very gateway, as it were. Looked at in isolation, a thought may seem very trivial or very fantastic; but it may be made important by another thought that comes after it, and, in conjunction with other thoughts that may seem equally absurd, it may turn out to form a most effective link. . . . Where there is a creative mind, Reason—so it seems to me—relaxes its watch upon the gates, and the ideas rush in pell-mell, and only then does it look them through and examine them in a mass.... [Freud, 1900, p. 103]. (Benjamin, 2005, pp. 191–192)

The descriptors given by Freud echo with the fecund possibility of that transitional space of sense-making, spoken of by Winnicott (1971/2005 and in Benjamin, 2005, p. 197) as, between worldly truth as given, *to be discovered*, and worldly truth as made, *to be invented*. And, I muse aloud at the surprise of similarity between these

psychic tensions and cultural ones—to wit, the supposed gap (arguably both fact *and* fiction, see Gould’s *Mending the Gap Between Science and the Humanities*, 2003) between the “*discovering*” sciences and the “*inventing*” humanities, within which we might find room for a middling transitional place of thirdness.⁷¹

And so it is that the development from fetus, to newborn, to infant, and beyond, begins from a raw creative possibility in neural disarray, and progresses through the powering of the world’s “knowing” in emergent synchronisation of a self in knowledge. Moments of neural (as conceptual) assemblage, fluctuate with disassembling adjustments, made across micro- and meso-scales of living. In these irregular life-rhythms, the emerging child, literally learns itself into extant being, doing so as it, at once, grows an awareness, through a mirroring and responding world, of what “it’s up to.” Put differently, increasingly the child learns itself as self-*with*-world, but importantly where self-and-world can only be but construals residing in the experiencing self. *The mind learns to contain a world, even as the world contains that mind* (see Damasio, 2006, p. 107). Coming to inhabit and in-form self, given the fray of a paradoxical world without and within, describes both challenge and richness of what it means to be human.

Ultimately all our beginnings arise in deep co-emergent continuities as the *with* of singular-plurality and this is the very condition of each of our individual beginnings with first caregivers. As shall be developed below, coupling events, mind-brain with world, as self-world-making, describe the conditioning of affect, the possibilities of self, and the subject of current attachment theory. But first, a consideration, too brief, of language.

⁷¹ I note here a self-conscious desire working this dissertation to both discover and invent its writing in the movement, to and fro, across a reconciling, creative, middle place in the throes of just such tensions as between reason and imagination, humanities and sciences.

Of language and unformulated experience.

Language plays a critical, seminal role in the ordering of experience. The early mind's principal preoccupation, during waking hours, will be the functional structuring of its primordial possibility, effectuated in an iterative strapping of elements of that dense, and originally near-random, neuronal proliferation,⁷² the brain, to an experientially orderable and ordered world⁷³ (Castro, 2012; Harkness & Tucker, 2000, p. 187).

Language is constitutive of experience. Together in dialectic interplay with culture, it colours and conditions the limits and possibility of what can be.

Physiologically, the ordering of possibility in mind occurs as the ebb-and-flow patterning of synaptic junctions to instantiate and fortify neural regularities in response to repetitions of sensation (Harris, 2006)—these rendered meaningful, and meaningfully accessible, in conjunction with the development of language through the same broad processes. Against the physiological instantiations of noted regularities—oft-times marked, and thus retrievable, through the associative symbolic networks of language—organisms construe and hone discernments of sameness and difference. All the while, in the attachment system (and conditioning subsequent relationality) these discernments

⁷² Early in embryonic neural development there is a massive, indiscriminate synaptogenesis and axonal and dendritic sprouting, creating a highly interconnected, undifferentiated nerve network (Huttenlocher, 1990). This network is then pared down and sculpted based upon functional usage.... As a result, functional sensorimotor circuits become strengthened, while unused circuits are lost.... One of the more remarkable insights of modern neuroscience has been that these basic mechanisms of embryonic neural morphogenesis continue to operate into the extended mammalian juvenile period. Based upon the information exchange between perceptual and motor systems and the environment, useful connections are strengthened, and unused connections are pruned (as cited in Nocenti, 1983; Neville et al., 1998). (Harkness & Tucker, 2000, p. 187)

⁷³ Learning is said to occur when an experience... imposes a pattern of activity on groups of neurons. The pattern alters the cells' interconnections: ties among co-active neurons grow stronger, and those among out-of-step neurons weaken. In this way, the cells become functionally lassoed together. This coalition becomes dedicated to preserving a specific fragment of experience—a memory. (Castro, 2012, p. 44)

acquire and are hinged to a specific affective tonality. Notably, the roots of the affective self are established early and primarily in the old brain's pre-discursive limbic system—a region largely inaccessible to conscious experience except if it has been languaged there through hippocampal activity (D. B. Stern, 2003). Without direct linguistic access (or the later re-experiencing of early affect observed through an older self and reconstituted in language) such affect is destined to become the substrate of those bewilderments we think of as emotional triggers in later life. This may owe to the fact that affective tonality is only consciously retrievable to metacognitive awareness through a symbolic retrieval network (language). Physiologically, language might be thought the qualia of deeply connective, neural networks linking and projecting historied experience onto the present.

That which is marked and retrievable as memory takes on the characteristics and affords the flexibility through language of accessible knowledge. By the same token, much that is loosed in forgetting exists in weakened or unused connections, seemingly adrift in the recesses of mind, but likewise at-the-ready to coalesce anew. Put more literally: Former knowing, that goes forgotten in disuse as the atrophy of dismembered neural patterns, remains present in cellular residues of lowered thresholds for neural co-firing among and across bundles and sequences of neurons.

That this be the case is sober reminder of the necessarily political, social, and historical contexts shaping knowledge and perceptual tendencies, that come to lie dormant in individual minds, affording the illusion of having been spawned there. “Knowledge is a prime effect of power. Knowledge, that is, is an *expression* of power, and... carries political and moral consequences” (D. B. Stern, 2003, p. 80). It is created

with and of the world by that world. Importantly, it is a world contextualised in language and culture and brought to us through the social, beginning in early primary relations.

The world, thus construed in knowledge, exists as dynamic system and accordingly inclines to hegemony (the convergence of congruence that fuels power). To embody knowledge with the system, as the system, is in some sense to both comply with and be conditioned through the grander system's power distributions. Thus, it is also the case that the residue of the system begins a work of settling into the uncanny places of each emergent self. A caution then, is in order about the complicity of the sense one makes: It is always borne upon past senses, taken-as-granted, and most often unwittingly so. With this proviso, consider D. B. Stern's unformulated experience, itself compellingly consistent with Winnicottian conceptions of creative apperception and curiosity.

He writes of the "unconscious creation of explicit meaning" coming *to* us, but as unbidden *from* within us; that is, out of the unformulated creative disorder that is also us (D. B. Stern, 2003, p. 68). Marginal, shadowy, vague experiences, the likes of dreams, for example, do not spring from the ineffable to the communicable through some force of sheer will, nor even as soon as resistance relaxes. Instead, these possibilities seem to exist in discordant fluidity, coalescing into coherence "in their own sweet time." The process is echoed in creative writing, wherein fiction takes on a seeming mind of its own, dictating itself to the author. So too, the loosening of brain connections makes possible different assemblages that in turn write us into that difference. In instances of such formulation, after the fact of their creation, we may look back and—marveling at the strangeness of what comes now as inevitable—exclaim "I *knew* that all along!"

Unlike Freud's repressed, which is always trying to return, it is not as if the unformulated is forever leaning against the door of consciousness.... The unformulated must organise itself first. It must somehow begin to coalesce.... It is only after the initial period of invisible germination, however, that volition can contribute..., [I]t is fruitless to force it. (D. B. Stern, 2003, pp. 69–70).

Articulated creations come to us unbidden of vague precursors. And given the organisational laying down of a self in life (literally as mind-brain), those vague precursors in infancy belong to the infant but also to the interacting adult.

“[D]isorder is the condition of the mind's fertility” (Valéry, 1952, in D. B. Stern, 2003, p. 75). And I would add, order is its containing possibility. We construe of both the thing and its shadow. Disorder and order, each cannot exist except as against the other, else all would be indiscernible and therefore no-thing.

I do not know what I am going to do; yet my mind believes it knows itself; and I build on the knowledge, I count on it, it is what I call *Myself*. But I shall surprise myself.... I need both my known and my unknown. (Valéry in D. B. Stern, 2003, p. 71)

And yet, how we encounter order and disorder, or the prospect of assemblage as against the uncertainty of disassemblage—that is, whether or not we have learned approach or avoidance to these possibilities and particular inborn human tendencies to sense-make—has everything to do with shared histories of affective experiences learned and honed with others in the world. We turn therefore to a discussion of the biology of motivation, the particulars of emotion and feeling, and the neurochemical rewards that position us, in the safety of good enough holding environments, to enjoy the risks taken

and learning to be had when we enact our agency to indulge curiosities about a world that draws our attention.

Affective Salience: Rooting Mind in Body

Important to educational concerns for motivation in learning, note that the present moment, as encountered, lived experience, is meaningful to attention and awareness because it is constituted by that which has engaged us, in some measure, affectively (D. N. Stern, 2004). This can be thought to occur either through present neurochemical systems signaling degrees of vitality (on a continuum from rupture to coherence, see Damasio's "emotion" below) or as consequence of recurrent associations with those systems (as cited in a brain that speaks mainly to itself, see Damasio's "feeling" below). The neurochemical connections constituting early emotions and subsequently primed as feelings are remembered and retriggered primarily through non-conscious association with the affective memory of our primitive limbic brain.

Parsing affect: On the emotions and feelings of surviving and thriving.

In Damasio's *Looking for Spinoza: Joy, sorrow, and the feeling brain* (2003), he posits the emotive valence of *all* experience, but in so saying parses affect into a distinction between emotion and feeling. Emotions describe affective states of physical being whereas feelings engage cognitive interpretations. One could say that feelings involve the bringing of memoried affective experience into present conceiving. That is, feelings express the currency through which we ascribe meaning to, access, and converse with/in physiological affective states. In this frame, feelings belong to a mind historied in experience and thus the maker of affective meaning past into present—where "*the human*

mind is the idea of the body” (p. 12)—and emotions are of an immediacy of present bodily experience.

Starting from the bottom up, Damasio names “metabolic regulation.... basic reflexes.... the immune system.... the [experiences of] pain and pleasure.... appetites.... [and] emotions-proper” (pp. 31–34) as increasingly complex “devices,”⁷⁴ nested each within the next, and dedicated “to solve *automatically*, no proper reasoning required, the basic problems of life” (p. 30). The “problems of life,” that the above devices are meant to solve, reduce to the ongoing challenge of “homeodynamic”⁷⁵ regulation in the face of ecological (as cited internal and external) flux. This is the first and primal charge and consequence of evolved being: to stay alive (and to live to infuse the tale into ensuing generations). Emotions are complexes that signal the condition of aliveness to the experiencing being.

All acts of being comprise shifts of energy that are, quite literally, movements within and of a dynamic, bodily self. In particular, nuances of affect—that is, emotions—proper—result from signature constellations of such movement. These are “coordinated.... collections of reflex responses” (pp. 42 & 53) where the reflex responses manifest in the likes of heart rate, blood pressure, galvanic skin response, and cortisol levels, for instance.

Thus, common to mobile and, through no coincidence, e/motive creatures is the survival requirement of coordinated, intentionally responsive acts in world. That said, as far as we know, “most of the living creatures equipped to emote for the sake of their lives

⁷⁴ Note that feeling is not an automatic device in his conception and is more cognitively and recursively layered than emotion.

⁷⁵ Homeodynamic is Rose’s term, preferred over homeostatic, as per Damasio, 2003, endnote, p. 302.

have no more brain equipment to feel those emotions than they do to think of having such emotions in the first place” (p. 50). A euglena does not register light and then swim toward it as a result of any *felt* emotion nor *thought* feeling. “Organisms can produce advantageous reactions that lead to good results without *deciding* to produce those reactions, and even without *feeling* the unfolding of those reactions” (Damasio, 2003, p. 51). Biologically, emotion need not imply feeling. Indeed when feeling is shorn as something apart from the complex neurochemically patterned reflex that is emotion, then we can meaningfully speak of an “angry” fly!

Damasio describes the way that feelings arise out of emotions-proper and how emotions likewise encompass and arise out of appetites, these in turn enfolding pain and pleasure sensations, and so on, in nested fashion to the basic biological function of metabolic regulation. Feelings, reside at the broadest most encompassing level. They are distinguished by their cognitively-recursive construal—taking meaning from and giving meaning unto enfolded emotions. Of homeodynamic devices and feelings, Damasio writes:

Without exception, all of these phenomena are related to adaptive adjustments in body state and eventually lead to the changes in the brain mapping of body states, which form the basis for feelings. The nesting of the simple within the complex ensures that the regulatory purpose remains present in the higher echelons of the chain. (p. 49)

To be sure, as each human being develops, so too does feeling become increasingly sophisticated. “Learning will play an important role in determining *when* the devices are deployed. The more complex the reaction, the more this holds true” (p. 34).

Ultimately the mind, in conversation with memoried experience (primarily in the limbic system), will come to make *affective* meaning (a feeling sense) of *affected* bodily conditions (sensations as emotion) by ratcheting up or down these conditions according to learned pasts.

Citing Spinoza, Damasio maintains that the essence of life entails in striving to be, and that the raw experienced tempo of that being is emotion: “Each thing, as far as it can by its own power, strives to persevere in its being.... [and t]he striving by which each thing strives to persevere in its being is nothing but the actual essence of the thing” (Spinoza in Damasio, 2003, p. 36). Over and above *striving to persevere*, I would add *thriving in being*. The physiologically felt rewards (see Edelman’s description of value systems in the brain stem and as a selectional system, 2006, pp. 17, 30–33) of exhilarating vitality (mimicked by certain recreational drugs) run beyond mere survival—they can be intoxicating in their allure. And I would describe the affect of such vitality in terms of what Damasio is calling emotion; that is, as physiologically experienced rewards, in this case, given of adaptive self-organisation.

Put summarily, successful resolutions of ambiguity comprise physiological assemblages (of brain), experienced conceptually (as mind), and they come with their own built in physiologically triggered and affectively experienced (bodily) reward systems. We are delighted when “the lights come on” or when we feel the sweet wholeness of a fluidly executed golf swing. Indeed, the effect is so powerful as to spill over to the observer: As teacher bearing witness to such heuristic moments in a student, I am myself elated. That such assemblage would be biologically rewarding should come as

no surprise. As a selected-for adaptation, the reward afforded of emergent heuristic ordering is consistent with planetary life's evolutionary path toward organisation.

Edelman describes the system of biologically felt “highs” given of neurochemicals—for example, dopamine, oxytocin, and serotonin, to name a few—as characterising what he terms a *neurochemical value system* (2004, 2006)⁷⁶. In particular, this biological value system doles out neurochemical rewards as accompaniments to conceptual-physical assemblages. This physiology expresses an evolved selected-for-consequence that encourage life forms toward advantageous efficiency, where a system functions more resonantly and seemingly effortlessly as a synchronous whole. As such we can speak of a neurochemical value system as fundamental intrinsic arbiter of the value of physical experience and, by association, a basic motivator of behaviours thus rewarded. Notably the experience of effortlessness becomes the result of practice rewarded. It arises out of a prior conditioning, instrumental to a cascading sequence of events learned and carried out by the body in synchrony with a familiar world. In dynamic system parlance, the system follows the probability path (a valley) of least resistance in its ontogenetic landscape of possibility (see Juarrero, 2002, pp. 156–160). In short, we repeat what feels good and resolutions of ambiguity, at the cresting of tensions, give neurochemical reward that indeed feels good and then makes life easier!

To reiterate, life forms resist disassemblage and are drawn to assemblage. Our essence is to want to continue to exist, as Spinoza writes. Our physiology prompts us to avoid pain and gives us a eureka “high” that, once experienced, draws us to seek out

⁷⁶ See also Edelman, 2006, pp. 17, 29–31 for inherited selectional bias systems, e.g., the brain stem's several diffusely neural “value” systems secreting neurotransmitters and neuromodulators in response to perceived perturbations.

more. Being “on a roll” of assemblage can be safe and rewarding, though the effect can have diminishing returns as our body acclimatises to prior difference as the new norm.

Yet, autopoietic being, in any sufficiently creative and adaptive sense, entails something beyond mere assemblage. It entails assembling differently—trusting oneself to a honed kind of intelligence that permits of touches of randomness, the appropriately placed flap of butterfly wings (to reference chaos theory), eloquently given and made, out of an uncanny sense within, resonating with the expansive rhythm and spirit without. As we have seen, “the consequences of choices sediment” (Juarrero, 2002, p. 253). We crystallise such that grappling, well enough, with assembling differently, increasingly asks that we draw strength and wisdom from a consciousness sufficiently freed from itself to inhabit the world—in short, to be moved in the wisdom and fullness of ever-expanding and ever-deepening singular plural being.

As has been discussed, the more crystallised a being is, the more creativity is likely to ask some form of prerequisite self-undoing in and with the world. Somewhere between the avoidance of coming apart and the messy uncertainty of creative coming together, we find reason to resist change, to remain “fixed,” that we avoid becoming completely undone, losing our essence, and thus ceasing to exist, at least as we know ourselves to be. “Backtracking” is not intrinsically rewarding. In the least, it risks self-knowing as identity. Moreover, it asks this for the promise of deferred gratification where gratification is not necessarily a given. Yes, the elation of eureka moments might constitute a pulling force to growth-mindedness (to borrow Dweck’s term, 2006); but, self-organisation from the less conceptually- and physiologically-organised mind state of infancy is surely more readily engaged than the hard fought eureka moments of later

years. In infancy, there is simply less ordered-self at stake to lose. With growing self-order, disassemblage—as rupture not aspired to (think “cognitive dissonance”) and oft-times vigorously opposed—is that which precedes revisionist assemblage (see Kazimierz Dąbrowski’s *Theory of Positive Disintegration*, Amend, 2008). It can be a source of anxiety.

The positive anticipation of, and ecological pressure for, adaptive paradigmatic shifts at the level of the individual are primed (in the case of positive anticipation) by cognitively conditioned appreciation of the past affective rewards, experienced of coherences earned and (in the case of ecological pressure) by affectively motivated aversion to ruptures and perturbations, from without, and the need and discomfort of self-accommodations within. All of which is perhaps to state the obvious: We move (learn and self-change) to pursue pleasure and avoid pain.

Couple this with the situation that the older we get the more difficult it is to make the world anew. If apperception imposes internally ordered objects of experience upon the world then, in such absence of outward seeking, the world itself gets conceptually smaller with experience in the familiar. All contracts, parsed into acceptable familiar and unseen liminal exteriority. In this way, the lessons learned of experience are those to both condition the ordering up of a biological system and to decrease the fluidity of that system as it strives to protect that which has been “fixed” in identity as, knowing and known, singular plural essence.

Thus, it would be reasonable to expect diminished amplitude, at least, in the waxing and waning of autopoiesis across the life of an organism—and that difference makes a difference to the affective signals—the foreseen and foregone consequences

driving choices considered and made. These differences, when brought into the context of the present era that presses lifelong learning, become central to educative concerns.

Matters complexify. Let me add that the gravitation to ongoing selfhood, as coherent-enough assemblage, is a phenomenon characterising all life forms, be these cellular, multicellular, or collective. At the level of the person, the draw to coherence is an *intrapersonally* experienced one and it presses for individuation. *At the same time*, at the level of the human collective, the principal of coherence is *interpersonally* construed and presses for relatedness among individuals. Our singular plural constitution can be thus understood spatially as nested emergent assemblages of being—of the life systems within which and of which we are formed. Raw affective “wisdom,” emotion-proper, prompts us even as it negotiates the simultaneity of these two, seemingly opposite, desires: *toward individuation in acts of exploration but also toward relatedness through acts of attachment*. We do well to keep in mind that want for individuation and relatedness are both at play in affect and across constitutional shifts in time, as primordial driving forces shaping learning.

A world calling us to attention: Perception, adaptation, reaction.

A background vigilance, informed by affect, calls conscious attention to the unexpected, discerns interruptive difference, and sets in motion decision-making processes in higher brain centres that alert a self otherwise “running on automatic pilot.” When the smooth and subconscious flow of previously-established feedback loops between self and world meets that which is noticeably unexpected, the experience of that infraction registers in affect; that is, it registers as neurochemical change prompting heightened exteroceptive, interoceptive, and/or proprioceptive attunement in concert with

re-negotiated acts (Juarrero, 1999, Chapter 13; Damasio, 2003, Chapter 2). However minor or major these infractions be, they provoke emotion (as cited in the meaning given by Damasio, see above) because they are physiologically linked to the primal vulnerability of a self-preserving self and the primal exhilaration of a self-creative self. Resistant to fracture and drawn to assemblage the persevering and thriving self adjusts itself, on the fly, to the whimsy and oft-times unpredictable flux of a world that comes to be experienced as fluidly ordered according to the terms of the experiencer and the experiencing species (Damasio, 2003).

The take home point here is that affect is entailed as the primal biology of our intrinsic neurochemical approach-avoidance systems. It is affect that marks salience. *Affect is always, to some degree, implicated as primary visceral principle in the call to conscious enactive being.* Indeed, if consciousness can be conceived as foveating a typology of salience of mind then the unconscious may well be that which feeds that salience—and it feeds it through the signaling that is affect.

Klin and Jones (2007), succinctly put the connection from mind to early bodily experience, sedimented in the present: “In some situations, words and combinations thereof can bring about overwhelming feelings and reactions in us. They can only do so because they are proxies to real experiences that left indelible traces in our senses and emotional make-up” (p. 12).

Lakoff and Johnson’s “integrated theory of primary metaphor” (1999, pp. 46–59) affords deep insights into how such links to language and cognition might be forged in the first place. They describe ambiguous early life experiences, and the marrying of understandings taken of everyday experiences such that meanings become resolved (see

processes of reentry and entrainment, above) into what Lakoff and Johnson call “experiential confluents.” For example, the metaphor “more is up” expresses an early conflation of quantity mapping onto verticality and is thought to be a result of such repeated perceptions as seeing *more* water added to a glass whilst witnessing a *rise* in water level (p. 47). “Because of the way neural connections are formed during the period of conflation, we all naturally think using hundreds of primary metaphors” (p. 47). I posit that we regularly think in and ascribe such linkages in meaning-making—that this is not a phenomenon necessarily particular to early childhood. Rather the primacy of these first confluents inheres in the fact that they are created first, and subsequently construed upon, such that they become so well established, buried as it were, that we have difficulty thinking and imagining differently.

In “The rooting of the mind in the body: New links between attachment theory and psychoanalytic thought” (2007), Fonagy and Target also review research linking original (from infancy) affectively experienced states of physical being and subsequent affordances of meaning carried forward in primitively encoded, limbic systems—(2007, pp. 440–446). Perhaps over-stating the case, they write:

We are attached to ideas because by becoming attached to them we can reexperience the bodily qualities of early bonding [emphasis added]. Embodied cognition allows for the expression of both libidinal feelings and attachment feelings, as well as a range of other unconscious concerns (relational concerns, self experience, and so on), through gesture, language, adherence to a belief, and so on, which gives expression to affect that is currently felt. This cognition and expression hints at the continuity of developmental structures at the unconscious

level, but this continuity occurs not through linear causation but through evocative echoing of a current feeling state. (p. 444)

The essential understanding to take away from these various discourses on affect, and Fonagy and Target's rather broad statement above, is the deep continuity in body as mind (largely unconscious) with which learners bring to their sense-making. The critical suggestion is this, "the way we experience cognitions... is linked to physical aspects of early infantile experience. Perhaps more profoundly... the very nature of thought, the very nature of adult symbolic processes, will be influenced by characteristics of the primary object relation" (Fonagy & Target, 2007b, p. 432).

Mathematics learning cannot be neutral and un-implicated. It is intimately connected in histories of mind-body emotion and feeling. To think otherwise is to miss crucially the very recursive nature of the sense of mathematics as a humanly shared, world-making endeavour. Consider but one simple example: Notice that "more is up" as a primary body metaphor is consistent with the Cartesian y -axis, incrementing as it moves away from us. Note that, more is up, but more is also away from the perspective of a small and less mobile child. Other related affective experiences include: Happy is up; control is up; intimacy is closeness; and similarity is closeness (Lakoff & Johnson, 1999, pp. 49–54). Were the y -axis construal experienced as contradicting such primary bodily metaphor then understanding would be rendered more difficult and the experience of trying would be affectively traumatising at some level. That something as seemingly benign as a number line can trigger anxiety at the most basic level of incongruence is surely sobering thought.

Attention “willed” onto a world: Agency and curiosity.

Consummate with a growing aptitude for discernment, born of the ordering and reordering of disorder, mobile organisms do act in the world and they act with a particular agency “in mind.” In humans, the most consciously forward and backward thinking of beings (Agamben, 2004, pp. 49–56; Dennett, 1996, Chapter 6; Donald, 2001)—pleasure-seeking and pain-avoidance, among other instinctual acts, driven ultimately by powerful life-need (see levels of automated homeodynamic regulation in Damasio, 2003, pp. 29–42), work with curiosity-provoked experimentations of an agentive self (Dennett, 1996, Chapter 2; Gergely, 2007) to explore and construe a world in terms of sense-making acts with and into that world.

Indeed, according to current developmental research, and as we have seen, “infants seem innately motivated to engage and discover the contingent reactivity of the stimulus environment as well as their own degree of causal efficacy in controlling aspects of the external world around them” (Gergely, 2007, p. 54). We are born naturally curious. Here curiosity “means allowing oneself to make constructions.... [It is] an active attitude of openness (Schachtel, 1959), not a focused search, at least not to begin with.... [Instead] one allows the possibilities implicit in experience to impress themselves on one’s consciousness” (D. B. Stern, 2003, p. 78). In the case of new life, such impressions do indeed work to create consciousnesses, doing so according to the responsive and meaning-making contingency of primary attachment figures.

Infants, at first, unreflectively engage in exploring their world and their agency to act within it, and they do so with seeming abandon—for, at first, there is little in the way of formulated experience to direct a focused search nor to act as rider on that which is

allowed. We are born with limited and specific social competencies and these need not amount to anything resembling introspective nor intersubjective awareness (Gergely, 2007, pp. 49–61). The emerging picture in infancy research finds problematic “the view that in early infancy basic emotion expressions are linked to similar internal feeling states and are evoked by similar stimulus conditions as in adulthood” (Gergely, p. 55).

Increasingly, research with infants, from the point of view of clinical theory and therapeutic practice, and “within the framework of contingency detection theory and attachment theory (Watson, 1985, 2001)” (Gergely, 2007, p. 57) supports an alternative view of intersubjectivity as “a developmental achievement... [with the] capacity for intersubjective experience as an emergent subjective property of the self rather than an initial and universal starting state of the human infant’s mental life” (p. 57).

Curiosity could be thought as the phenomenon of enticement-to-a-becoming desirous of playful juxtaposition of the singular in and with the plural—of a self pressing and impressing itself against and with world, if only to marvel at what happens; that is, to feel agency as presence acting in the world. Here I am thinking curiosity in terms of the play of the self in possibility—the likes of first explorations in arm- and hand-movement sequencing and control that result in soothing thumb in mouth, or that provocation to inquiry and agency as baby repeatedly slides objects to the edge of the high chair to contemplate and learn their subsequent fall to the floor. The pulling force of intrigue that we call curiosity is experiential phenomenon of life’s inclination to push edges of self, in manner to know those edges and be neurochemically rewarded in new neural assemblage—that in the doing, vital being as a vibrant becoming is opened. Gergely narrates the quality of an innate

contingency detection module.... [that] automatically monitors and assesses... in parallel... temporal contingency, spatial similarity, and correspondence of relative intensity.... to identify those stimulus aspects of the social environment that are under (some specific degree of) *causal control* of the infant's state expression and behavioural displays.... [T]he degree that the social environment exhibits systematic and differential contingent reactivity... generates an experience of causal efficacy and self-agency in the infant. (Gergely, 2007, pp. 60–61)

Development

Making sense of sensations.

To bring these notions into present concerns about human development, return again to the neonate. Consider that a child is born with signature neurochemical patterning of emotions-proper, these as mere (and yet stunning) body-signals of disequilibrium and of emerging vitality. For the purposes of the present discussion, I continue to invoke Damasio's distinction, that emotions consist in those instinctual physiologically felt differences-in-being, exquisitely manifest to the self, by the self, according to evolved "congenital neurobiological wisdom" (Damasio, p. 79). Prior to birth, it is the case that the fetus exhibits various reflex responses to environmental conditions, but these appear to serve the actualisation of the nascent brain itself through, at first, "massive storms of sensory-motor stimulation [startles]" (p. 403) and, later, partial movements in preparation of goal-directed behaviour⁷⁷ (Piontelli, 2006).

⁷⁷ Fetuses engage in much movement. They "cover and stroke their face with their hands, touch their legs, feet, genitals and more" (Piontelli, 2006, p. 395), however the "bodily sense" evinced does not entail "any complex form of awareness or even perceiving. Sensing—the receiving of information about the external environment—and perceiving—a more complex operation involving the interpretation of the sensations to give them meaning—may not coincide in the fetus [12].... An active early fetus

At birth, the human brain—more raw potential than that which will increasingly come to be organised by experience—“speaks” less coherently and recursively to itself. Accordingly, the newborn’s mind’s capacity to experience feeling as a nuanced sense, made of the bodily interoceptive conditions of emotion, is quite simply not yet in place to any degree commensurate with even the more organised mind of a one-year old. And so, when it comes to affect: In ontogeny as in phylogeny, “emotions precede feelings” (Damasio, 2006, p. 28). Taking all of the above distinctions seriously, present understanding describes the newborn condition as *emotion not yet organised by feeling*—which is to say *infants experience sensation absent much sense*.

How does this play out in first world encounters? First experiences, as interoceptive and exteroceptive sensation, are initially absent meaning except the acuteness of preconditioned, instinctual, life-urges met and not met—these expressed neurochemically in degrees of comfort and discomfort (Damasio, 2006, pp. 31–42; Gergely, 2007, p. 58). Although coming to reverberate nearly indistinguishably together, physiologically experienced emotion, as we have seen, precedes (both developmentally and temporally) cognated feeling (Damasio, 2006, pp. 29–31). Whereas “emotions play out in the theater of the body [raw physicality]. Feelings play out in the theatre of the mind [brain]” (p. 28) and the instances of such “play,” as it turns out, are locally measurable. To reiterate the point, emotion is the interoceptive experience (sensation) of raw physicality; feeling is the cognated experience (sense) made of such interoception. Subsequently and recursively, emotion as triggered by feeling, reverberates and recycles in the cognating mind—being amplified or otherwise modified, as per conscious and

may just sense what a mature one approaching birth could by then perceive” (p. 395).

unconscious re-emoted memories. Early affective experiences seminally condition later ones.

Though the newborn experiences the immediacy of emotion in terms of needs and appetites met or not met, she or he has not yet a conscious awareness of these experiences as constructs—and so, interestingly, present moments might be thought all the rawer and more pervasive, given the relative absence of a background world sense against which to mark unusualness. The infant could be thought diffusely alert. The child is not born with any constructs of which we might properly speak (Damasio, 2006, pp. 79–80), these only emerging as consequence of neural sense-making—the becoming of self in a social *with* of a remarkably enough, patterned, networked world. A child’s consciousness is thought to be more *exteroceptively* attentive (Gergely, 2007, pp. 58–59) and *exogenously* oriented (Gopnik, 2007, pp. 503–504).

An *exteroceptive, exogenously oriented attention* implies that the child is more attentive to the world without, than the world within. This orientation is not so much intrinsic predisposition as it is experientially rendered and environmentally conditioned in consequence of a biology of internal-to-external neural synchronisation—an internal experiential coupling of child to a rich, responsive, languaging, social world. Perceptual habit, neurally, is to internally strap co-occurring experiences, any such experiences, together—and this could be thought to occur just as much for those experiences arising interoceptively and endogenously (as exteroceptively and exogenously). That said, it is co-occurrence in the world that conditions a budding “logic” of internally organised experience. Importantly however, with memory, interoceptive experience and endogenous orientation would also involve the internal re-experiencing of experiences

recalled by a brain that “speaks mainly to itself” (Edelman, 2006, p. 20). Thus we have internally an accruing of neural organisation that gives rise to a “rich inner life,” most of it unconsciously moving us. Externally, however, it is language that gives a name to experience and further organises it, through the social, by drawing attention to observable and communicable exteroceptive sensation. Language too becomes, by neural association, a trigger for internal experiences less directly accessible to our conscious awareness.

And so, it makes sense that the infant—with only nascent memory and in the presence of an “other-organising,” pointing, teaching, social world—would orient exogenously to exteroceptive sensation. Too, this should come as consistent given our heavy dependence on sight and the possibilities of communicating through language the experiences of smell, taste, touch, and hearing with other humans. Absent adult attention to, or at least acknowledgement of, more nebulous interoceptive sensations, the infant is surely prompted to attend more to encounters with an external world than to experiences of the private, mostly unnamed internal one.

In any case, and importantly so, it could be expected that, the very internal nature of interoception⁷⁸ diminishes the opportunity to develop a shared symbolic system to communicate and contribute to a developing awareness of affective self-experience. One need only feel the helplessness of the parent of a colicky baby to appreciate the vast unknown, untouched, loneliness of interiority. More akin to animals without language, we rely on sophisticated readings and manifestations of facial and bodily gesture to learn

⁷⁸ Examples of interoception include such monitoring and sensing given of stretch receptors (e.g., pulmonary, muscular, esophageal), electrolyte and chemoreceptors (sensing, e.g., blood composition), equilibrioception (balance and acceleration), thermoception (heat, thermal radiation), proprioception (and related kinesthetic sense of self in space), and nociocation (pain).

and teach a formulation of that interiority of self into conscious awareness. *The ability to communicate and validate such senses, as exist within, strikes me as a crucial component of good enough parental attunement—and as I hope to develop, good enough pedagogical attunement.* It also, seems to me, to describe the movement of the arts—those evolved communicative networks as speak most directly through and to the bodily textures of emotion and feeling. Indeed, it seems not coincidence that many, struggling in adulthood, find relief in meditative and mindfulness practices that return attention to and validate a somatic wisdom that, owing to its opacity to verbal language, too often goes dismissed, ignored, or neglected in a society focused on pragmatically-oriented externalised willpower.

For all of these reasons, I expect that newborns are equally aware of interoception as exteroception, but that life experience with attachment figures quickly prioritises attention to exteroception. Indeed, I would argue that the self- and other-recognition cued in attuned mirroring (to be developed below)—in contingently marking affect to the infant—performs a crucial acknowledgement to the child of his or her own interoceptive selfhood, and in so doing affirms the child’s existence in a larger common world. Such enactments set the tone and quality of secure attachment.

In the category of exteroception however, we have strong evidence of what Gopnik terms an “exogenously-oriented consciousness” in infants. Whereas an *endogenous* consciousness entails the “willed” capacity for paying attention, *exogenous* consciousness is at the whim of that which, to varying degrees, “catches” one’s attention in the perceivable world (internal or external). Gopnik characterises the young child’s consciousness as exogenous: a “vivid but distributed phenomenology” of “lantern”-like

attention. In contrast, in maturation the mind learns itself into the more top-down inhibitory capacities of an endogenous, “spotlight” focus, said to be rallied in adult consciousness⁷⁹ (Gopnik, 2007, pp. 502–503). In brief then, the child might be said to be bathed in bodily affect as emotion, while outwardly spanning a world of sensation and internally assembling resolutions of perceived ambiguities (neurologically-so via reentry and entrainment) through the exploration of agentive acts of an increasingly proprioceptive self onto a contingently responsive world. In both inward and outward gestures, learning entails an active “making” of a self in resonance with an experienced and experience-able world. How that self-making proceeds has been the subject of considerable fine-grained study exploring, in particular, how we move in development from encounters in world to socio-affective understandings of oneself in and with that world.

Socio-affective development revisioned.

Klin and Jones, researchers in infant social development and childhood autism, draw from the insights of Piaget, Vygotsky, and Mead to contribute to what they deem a

⁷⁹ Is this at play conditioning many an adult’s resistance to inhabit ambiguous situations? How fundamental is this to shifting differences according to age in learners? Do we adults attempt to manage education according to our own seeming need for control—limited according to our own anxiety triggered at the suggestions of overwhelming ambiguity? Gopnik writes:

In adults, many very different functional and neurological processes are highly correlated. Attention is focused, inhibitory, and top-down, and it leads to plasticity and learning, and it is reportable, and it is in the service of goals, and it is connected to a sense of self, and so on, and so forth. In development, this apparently unified picture breaks apart in unexpected and informative ways: Babies may have access for induction but not planning, have exogenous but not endogenous attention, and have plasticity and facilitation without inhibition. Rather than a single story of capital-c Consciousness, there may be many very varied relations between phenomenology and function. (2007, p. 504)

I am, too, marking here a resistance to succumb to the temptation of musing aloud over the seeming resonances across this lantern consciousness, mindfulness practices, and presence, on the one hand, and spotlight consciousness, mentalisation, and awareness of awareness (the phenomenological attitude and *époché*), on the other hand. I leave instead the reader to so muse. (See Wallin, 2007, for mindfulness and mentalisation practices in psychotherapy, especially Chapter 9; see Thompson, 2011, Chapter 2 especially for a discussion of the phenomenological attitude and *époché*.)

revisionist approach to developmental theory—one effectively grounded in embodied cognition. “It is the adaptive function of cognition in its social context that shapes the emergence of cognition (Fonagy, 2007, p. 42). Fonagy, commenting on the work of Klin and Jones, highlights the primacy of “affect and predispositional responses” as cognition’s “mental fuel” (p. 42). A wrong-minded focus on brain-based mechanisms of information processing, they argue, is conceptually mired in a computer metaphor that separates “cognition on the one hand and actions or bodily sensations on the other” (p. 6).⁸⁰

Reportedly, in a 1973 address to the American Psychoanalytic Association, Piaget compared psychoanalysis’s “affective unconscious” with his own work on “the cognitive unconscious” (Klin & Jones, 2007, p. 8). He emphasised that neither the affective nor the cognitive unconscious was directly available to introspection unless mediated by language (p. 7). Moreover, though Piaget contributed an understanding of the role of sensorimotor experiences in making unconscious bodily sense of the physical world (p. 8), he was less prepared to consider “sensorimotor schema” as central to the unconscious bodily sense made of a social–affective one (p. 9). It would have been an even greater stretch for him to have considered that all cognition might ultimately ride atop such affective sensing as could be made meaningful and accessible through immersion in a socially responsive world: “In Piaget’s world, caregivers could be imitated, but they were otherwise non-players in the child’s development” (p. 9).

Klin and Jones advocate “de-sanitizing” Piaget’s observations by infusing his developmental account with the social, in particular, by considering how learning-in-

⁸⁰ I worry about the same difficulties visited by brain-based emphases in current educational contexts.

action is at play in the infant–mother dyad. Accordingly, they join others, including myself, in advocating the radical proposal of embodied cognition: “that all mental representations... are proxies for the actions that generated them and for which they stand (Lakoff & Johnson, 1999; Thelen & Smith, 1994; Varela, Thompson, & Rosch, 1991)” (pp. 36–37).

Of course, for Vygotsky, “thought itself was a social phenomenon” (Klin & Jones, p. 9). Klin and Jones note the primacy of affect, as developed in social contexts, in Vygotsky’s attention to the personal sense, as opposed to a dictionary meaning, of words. Here sense (for Vygotsky and notably developed by D. B. Stern) entails “the body of vaguely defined, personalised, and individualised sensations that are associated with a given word... [and that reflect] the individualised experiences of a person in the process of acquisition of that word or concept” (Klin & Jones, 2007, p. 10). Contrast, for example, the definition of “mother” with the sense of “mother” and all its affective associations.⁸¹

Klin and Jones then draw from Herbert Mead’s thinking about the emergence of symbols. In particular they note Mead’s location of the “meaning of a gesture... [in] the response of the other” (p. 11). As the performance of a gesture (facial, bodily, or vocal) gains predictive capacity in terms of another’s response, that gesture enters the realm of the symbolic. Learning, in these contexts, entails coming to embody the meaning of a

⁸¹ The difference is perhaps most compellingly made clear in the condition of Capgras syndrome where, owing to brain injury (as cited in some cases), a patient recognizes the features of someone familiar, but in the absence of the familiar affective signals claims the person an imposter. In prosopagnosia, the reverse function is impaired; that is, although affective signals occurs (autonomic system arousal, e.g., galvanic skin response) the person fails to consciously cognate the salient recognizable features of the person. In other words, in Capgras syndrome the patient sees, for example, her mother and claims her an imposter. In prosopagnosia, the patient feels the effects of being in the presence of mother, but without recognising her.

symbol as its social significance. By rooting “the *meaning* of mind... in the reaction of the other to the child” (Fonagy, 2007, p. 43) a revisionist perspective on development understands “the social process for the emergence of mind as the internalisation of other people and their responses” (Klin & Jones, 2007, p. 12).

Within the highly charged settings of human dyads, triads, or group interaction, the individual’s actions upon others become imbued with meaning as a result of the reactions of the others to those actions. These meanings are composites of feelings of pleasure, displeasure, fright, tenderness, safety and lack thereof, helplessness, panic, predispositions to approach or to flee, to hit or to caress, or, more generally, they are as complex as there are experiences resulting from the interaction of people. (Klin & Jones, p.11)

As clarifying counterexample, Klin and Jones trace the symbolic and social development of children with autism, a condition described as “derailing the process of socialisation from birth” (p. 14). They present “Helen,” an autistic child demonstrating age-appropriate “nonverbal cognitive functioning” (p. 16), but for whom sociability at 15 months shows neither preference for human speech sounds nor for returning an adult’s gaze—both these inclinations typical of four-day old infants. Moreover, whereas seven-week old infants are drawn to socially salient features of the face—especially the eyes as opposed to the mouth or the contours of the face—autistic children fail to show such tendencies (p. 16). It seems that, though autistic children can orient to and learn *about* a physical world—construing sophisticated ways of thinking about physical events—they are disadvantaged when it comes to perceiving the difference of the biological. That is, perception and conception are compromised when it comes to noting “patterns of

movement as biological” (p. 34) and thinking about people in organic, non-mechanistic ways (p. 19) that make possible the attribution of intention and social meaning (p. 22). Absent the seemingly instinctive proclivity to swiftly assemble the human and the biological into conceptual meaning, the autistic child is quickly overwhelmed by the otherwise undifferentiated salience of life. Accordingly, failing such conceptual assemblage, the next best solution is the bracketing of attention, for example preferring, when watching a speaker, to attend to the matched mechanical movement of mouths rather than hearing the words while attending to the emotional salience imbued of the eyes. Greater fixation on objects in infancy (as opposed to people) strongly correlates with more pronounced autistic disability (pp. 22–23). “A child with autism, may watch someone without seeing a person” (p. 20)—leastwise, not in the same way as other children seem to be able to “relate” to people. In this way, autism mitigates the ability to learn oneself into and through fluid immersion *in* a social world (Fonagy, 2007), an observation that bears relevance to understanding what human proclivities come to be enacted in infancy as part of a trajectory into lives vigorously experienced in the with of singular plural being.

Noting an increasing tendency to describe developmental skills as “‘perception-for-action’ systems” (p. 33), Klin and Jones reiterate the point of embodied cognition and its link to the social through the sensing body.

Perception and cognition on the one hand, and an act of adaptation on the other hand, are tied together into a unit of social adaptation.... [P]erceiving something... means something internally to us because this perception—and the

cognition associated with it—cannot be severed from the action that it engenders.

(Klin & Jones, 2007, p. 33)

Finally, these authors emphasise the unique unidirectionality of the visual system, and a consequent “need for a natural mirror surface if vision is also to become self-referential” (p. 37). In short, their argument from embodied cognition leads to the primacy of social affect-mirroring in the shaping of a self.

Individuation, relatedness, and social affect-mirroring.

Often, and perhaps commonly so, the essence of the development task is thought to consist in a protracted decoupling of mother birthing child into independence. However, as it so happens, such independence is, in complementary countervailing fashion, effectuated through a socio-affective coupling *with* mother *into* world: Even as such coupling affects and changes mother (Leckman et al., 2007; Shanks, 2007), it also brings and contains child into world (Klin & Jones, 2007).

Working cross-culturally and considering individualist *intrapersonal* contexts alongside collectivist *interpersonal* ones, Imamoglu and Imamoglu (2010), correlate patterns of trust in self and other with degrees of *individuation* and *relatedness*. They describe “harmonious being” as consequence of individuation *with* (not from) others. In harmonious being, the degree of self- and other-trust is appropriately and functionally⁸² suited to *exploration security* on the one hand and *attachment security* on the other. Their findings indicate a complementary relationship between the intrinsic motivational

⁸² By describing trust as “appropriately and functionally suited” I mean to avoid the blanket contention that all trust is good. Surely under conditions of threat, it is unwise to trust. The person, characterized as high on both scales of individuation and scales of relatedness, trusts when trust is due. That is, she or he reads well the situation and fits the level of trust in functionally adaptive ways—ways that work well and without undue or misplaced anxiety. Perhaps, more than anything, it is the displacement of anxiety that characterizes inappropriate or dysfunctional trust or absence thereof.

variables of secure exploration (e.g., curiosity, perceived autonomy, and tolerance for ambiguity) and the affective-relational variables of secure attachment (e.g., parental love-acceptance, low trait anxiety, and satisfaction with self, others, and life in general). The archetype of a balanced family context is said to promote harmonious being through a familial culture that sufficiently occasions: (a) *individuation* and self-coherence, by supporting curiosity and the desire for agency and autonomous being (qualities consistent with the biological need for assemblage and what I have associated above with surviving and thriving at the level of persons) and (b) collectivity and belonging, by supporting *relatedness* and affording the conditions for secure attachment and emotional closeness (thus consistent with the human proclivity toward collective assemblage and upon which our personal surviving and thriving as social beings also depend).⁸³

The conclusions of Imamoglu and Imamoglu join a growing body of research that no longer positions the separation of self from other as “a phase-limited developmental task, even *the* [emphasis added] developmental task” (D. N. Stern, 2000, p. *xiii*). Instead, self/other differentiation, instantiated with and through socio-affective contexts, is

⁸³ Moreover, and conscious of promulgating gender constructions (by interpellating, yet again, limited, sanctioned, and ubiquitous performances of gender), recent work in neuropsychiatry points out a male prioritization of individuation and self-coherence over relatedness as consistent with a likewise male tendency to “cognitive empathy”: activation of the temporal-parietal junction system by attending to emotions through the action, in particular problem-solving (Brizendine, 2010, pp. 96–99). In contrast, females prioritise relatedness and group cohesion over individuation, and this is, likewise, consistent with a female tendency to enact “emotional empathy”: activation of the mirror-neuron system that attends to emotions through self-other relatedness (Brizendine, pp. 96–99). These differences in brain activity, in turn, are consistent with differing hormonal effects, most notably, of testosterone on the male side and oxytocin on the female—as demonstrated in studies ministering the complementary hormone to one or the other gender (Brizendine, pp. 100–101).

The assumption of course in these medicalized accounts of gender difference is that the localising of a neurological instantiation of a behaviour, in some way naturalizes and legitimizes that behaviour as “to be expected,” immutable, biologically “right”—and in this case as demonstration of innate maleness or femaleness. Just such an assumption is one to miss on two crucial points: brain plasticity and deep embodiment. The locating of a physical “reason” (as cited in the brain or otherwise) for a behaviour merely reinforces the circular and reiterating point that we become the choices we make and, to a large degree, the lives we inhabit or are given to inhabit.

understood as being in process almost from birth (D. N. Stern, 2000, p. *xiii*). The infant's major developmental task is both the creation of ties with others (as increased relatedness) and the forging of autonomous selfhood (as increased individuation). As with Nancy's paradox of singular plural being, these seemingly polarised tendencies turn out to be complementarities.

Lessons in singular plural being are first shaped in accordance with caregiver (usually maternal parent) attunement, in particular, via social affect-mirroring enacted in a kind of turn-taking play where the parent acts as a mirror mimicking back to the child the emotional and cognitive-feeling states that the child exhibits. Importantly, in the conditioning of secure attachment, mirrored affect is given as such (and not as primary affect)—that is, the child and adult, both come to know that while the mirrored affect acknowledges another's emotion, it is, at the same time, clearly indicated as *not* the emotion actually felt by and belonging to the mirroring subject. Such mirroring is “contingent,” “marked,” and “containing.”

To say that the mirroring is contingent is to note that the attachment figure's affect is expressed in direct pedagogical response to the child. For example, when the child expresses disappointment the parent acknowledges an understanding and a receptivity to that disappointment by mimicking it back in facial expression and voice inflection. In effect the adult says, “Aw you're sad.” The mirroring is also marked as pretend: It is communicated that while the adult is attentive and concerned, he or she is not in the same way sad. Rather the pedagogical point is to note and render safe. The caregiver lets the child know that his or her affect is seen, exists, and has a name in the

world. “As Wittgenstein (1968, §580) stated, ‘An ‘inner process’ stands in need of outward criteria’” (Carpendale & Lewis, 2006, p. 241).

Crucially, the containing function occurs when the child experiences self-acceptance in a world large enough to hold her or him safely within. The attachment figure survives the child’s emotional states. Jessica Benjamin (following Winnicott) captures the essence of the experience,

Only the child who forcefully expresses her anger and finds that the other ‘survives destruction’—neither retaliating nor withdrawing—has the opportunity to learn that the other is, in fact, a separate subject rather than an object.

(Benjamin as explained in Wallin, 2007, p. 56)

In this way the enactment of social affect-mirroring accepts and diffuses frighteningly over-powering and potentially overwhelming aspects of the child’s emotional and cognitive-feeling states. The burden and responsibility of omnipotence lifts from the child, even as a curious world is announced for the exploring.

Note how—in the presence of a caring, secure, and self–other aware adult, able to fluidly perceive, acknowledge, and accept the child’s raw emotions and evolving, feeling states (feeling naming the Damasio’s interweave of cognition and emotion)—good enough social affect-mirroring affords, at once, lessons of self and world. These enactments express first movements from dyadic interaction to triadic. Indeed one might say that the child’s conception of world shifts from an undifferentiated continuity of oneness to, at once, twoness and worldness because the parent is, in effect, that singular-plural other whose very existence presupposes world.

Notably, good enough attunement is not perfectly matched to the child. Affective re-renderings are contingently reflective of the child's emotional and cognitive states, but not faithfully so. That is, the good enough parent is also, at times unattuned and in that *just so* "absence" the child learns to feel and exert an insistence of self and a budding capacity for self-reliance given the inevitable experience of the parent's (and so the mirrored self's) reassuring and affirming return. Affect given as a containing mock-up that respectfully, and oft-times playfully, though always seriously, acknowledges the child's emotion, returning it as understood, validated, and sometimes named (so subsequently retraceable through language) is attunement that affords the stability and security of a larger socially-worded world—a holding environment, of the Winnicottian sort (1971/2005) where his or her being can safely explore the making of meaning that is the making of self.

In terms of individuation and relatedness, we might say that, where parental mirroring is sufficiently contingent and marked, it gives attentive audience through acknowledging manifestations of the child's interoceptive sensation (as emotion)—a unique self-existence that becomes tangibly visible to and thus present in the world. Such a mirror suggests back an account of the self as visible and heard—an account with which the self can then begin to take ownership in the play of being. On the other hand, in as much as the mirroring is marked and containing, it enacts an audience that also tells of a difference and a larger world into which the child contributes, is accepted and might belong. Individuation, singular being, and the potential for autonomous agency arise out of contingent mirroring that is marked. Relatedness, plural being, and the potential for an

ever-broadening participatory consciousness is made possible out of the marked and containing function of such mirroring.

In this way the child becomes self in the *with* of shared being. But how, specifically, does this near-magical feat play out in the minutia of every day, and how is it embarked upon in the first place? What organic tendencies and processes make possible the threading of self and other that we be and become one in many and many in one? To answer these questions, following a brief interlude to consider the voice of Matt's understanding, I will turn, in Chapter 5, to a body of literature with roots in attachment theory, but having significantly matured since those early beginnings some half-century ago.

4.5 In the Spaces (2): Matt's Voice

Giving Audience to Mathematical Thinking: How is this Right?

Mon, June 8, 2009.

Lissa: So tell me how you got to 49 [from 42, adding 7s].

Matt: Um. Took away the 2 and added 7 and then added the 2 again.

Lissa: OK. So why did you take away the 2 to add the 7.

Matt: Because 7 plus 2 is hard to imagine.

Lissa: Than 2 plus 7?

Matt: No like. No. 7 plus 2, like just 7

Lissa: Oh I see. So you did 40 plus 2 plus 7. So 2 plus 7 is 9. And 9 plus 40?

Matt: No. Like.

Lissa: Yeah show me.

Matt: Like 42, so then I took away the 2 and put the 7 there,

Lissa: OK.

Matt: And then I added the 2.

Lissa: OK so my question is, so 47 plus 2 is easier to do than 42 plus 7? And can you explain to me why it's easier. Like, how do you go from 47 plus 2 to 49?

Matt: Ah. Like 7 and then 8 and then 9.

Lissa: Oh I see, so you count up.

Matt: Yeah.

Lissa: It's a better counting-up strategy.

Matt: Yeah.

Lissa: Got it. OK. *[Now where to from here? I'm thinking. While he continues to fill in the chart of multiples.]* So you put 62, then you erased 62, and then you put 62 back. Talk to me about that.

June 21, 2009.

Lissa: OK convince me somehow why odd and odd makes even. *[I give him the unit pieces.]* Go for it.

[I get him juice while he works.]

Lissa: K. What'ya got?

Matt: Examples? 3 plus 3 is 6, and 3 is odd, 6 is even. And 5 plus 3 is 8.

Lissa: So two examples. If I said all women are brilliant because look at your mom and look at me *[laughing]*. OK maybe not. But would you be convinced?

Matt: No

Lissa: So how can we generalise from this? This supports your argument but how can we generalise? What is it about odds and odds that make evens?

Matt: You can take one from each and then have 3 even numbers here... or you could take one from here and put it there and then you'd have 2 even numbers. Like you can divide them up so that they equal even numbers and when you add them together they have the same sum.

Lissa: Is this what you are saying? If I remove 1 from an odd it becomes even?

Matt: No it's still an odd, but you have to—

Lissa: What's left is even?

Matt: Yeah

Lissa: And now I have this extra dude and I put it on the other odd and now it becomes even? And so now everything's even?

Matt: Yeah they're both even numbers and they still equal another even number. They equal the same thing as 5 plus 3.

Lissa: I'm noticing this comes out to 4, 4. And so it makes it feel like it's a special case. So does it work if I have something that far different? So what is that?

Matt: 7 plus 3 is 10.

Lissa: Explain why [it's even] using your strategy.

Matt: You go like that. [He aligns them in pairs]

Lissa: Do you have to make them always be the same? Can I remove one? Now that's even, and now I have to put it over here, and that's even?

Matt: Yeah.

Lissa: So an odd plus 1 or an odd minus 1 always gives an even number, 'cause they're in between things.

Lissa: Talk to me about this 'cause how you explain this is different from how you explain that.

Matt: Actually it's reverse.

Lissa: Here's my take on your strategy: You're thinking if you can arrange these so they were exactly paired off then you would have even numbers.

Matt: Uh huh.

July 19, 2011.

Lissa: So, what's the best use of me?

Matt: If you could look over this, and then we'll finish it today and then after that work on this stuff.

Lissa: OK. Do you want me to check this while you're doing that?

Matt: Yeah.

4:32 – 11:52 [silent work]

Matt: So on this one [pause], why is it like that? [He is looking at a graph of $y = -1$]

Lissa: Your y is negative 1. So y is negative 1, here, and here, and here. All along the x-axis.

Matt: But it makes it seem like x is.

Lissa: I know. It's along the x-axis because x is the only one that gets to change. Y stays in the same spot so it just fills in all along.

Matt: Mm.

Lissa: Yeah I know, that's probably why I get it confused too. If x is 1, then the thing that's changing is y, so you know it looks like a y line, and vice-versa. Maybe that'll help me.

...

[Graphing inequalities]

Matt: So when I get to this stage I plug in some point here and see if this statement is true? So if I plug in zero that would be [he indicates an area of the graph to be shaded].

Lissa: Yeah, zero is less than 6. You'd shade—

Matt: —the top part.

Lissa: Yeah.

...

Lissa: *This one here, you actually didn't finish.*

Matt: *Yeah oops.*

Lissa: *It's a completing the square question.*

14:08 – 20:10 [silent work]

Lissa: *I just want to show you something about how I proceed. It would be good to hone this habit and it translates anywhere. For example here.... I am showing more concept and less arithmetic. Try to go in that direction.*

Matt: *OK.*

Lissa: *And use a piece of scrap paper for the other. So trace your logic so it's visible.*

Matt: *OK.*

Lissa: *And I didn't do that to insist on that particular way of thinking. I was just showing how I would proceed.*

Matt: *Yeah.*

Lissa: *It also helps markers and they give you the benefit of the doubt when you do stuff like that too.*

...

Matt: *What's the point of ever trying out a point that's not $(0, 0)$.*

Lissa: *You can't use $(0, 0)$ if the line is right on it.*

Matt: *Oh yeah, then you've got to use something different.*

...

Matt: *Well, inequalities don't seem that hard.*

Lissa: *No, it's just adding on to what you already know.*

Lissa: It's like anything in math, there's this initial part and if you have a deep understanding, then the next bit comes along. So now if you get quadratics and you get graphing, these are just little bits added on, like decoration kinda thing.

Matt: I know.

...

Matt: I haven't tried that yet. Is it like the other ones?

Lissa: Algebraically, what does that mean to you? What do you mean by the other ones?

Matt: Substitution?

Lissa: Or subtraction? In this case, because they're both squared I don't want to square stuff, but you could change all the signs on one and then add those two equations and your x-squared is going to go. Basically multiply both sides of one of the equations by negative one. But find a way to label and keep track of what you're up to.

Matt: OK. Wait, can I?

Lissa: Yeah, that's what I would've done 'cause I'm always looking for the easy way out.

...

Lissa: By the way, what shapes are these? [We're looking at equations.]

Matt: Circles.

Lissa: What's this one? This is not a circle. This one's a circle.

Matt: An ellipse?

Lissa: This, well, mmm... Good question.

Matt: R. No. Hyperbola.

Lissa: I think that's a hyperbola, yeah. That's—

Matt: That's a circle.

Lissa: Yeah. No. That's actually not a circle. That's an ellipse. Notice the coefficient 4.

Matt: Oh yeah.

Lissa: Because your equation of a circle—

Matt: Yeah it's pulling it out, the 4.

Lissa: Yeah, it's going to stretch it. Cool.

...

Matt: This. Did not get this.

Lissa: I did this whole assignment myself so that we'd have an answer key, because we're running out of time. Plus, strangely, for me, it's actually fun.

Matt: [Bemused.]

Lissa: It's kinda like doing crosswords. It's mind relaxing when you're in that space.

Matt: Yeah. I've found that, when I actually want to do it.

Lissa: When you get the hang of it. OK. Assignment 3.3.

Matt: Should I do this one?

Lissa: You might as well. You have to complete the square.

...

Lissa: Good, you're on the right track. [He settles to work.] Do you want tea? [Music is now playing in the background.]

...

Lissa: I can't believe you don't like coconut-banana tea!

Matt: It seems that women like coconut more than men. [Atmosphere is mutual respect and relaxed.]

...

Matt: So now I've got all this. [He has worked the equation to: $(x - 3)^2 + (y + 4)^2 = 20$.]

Lissa: Right so, what's the centre of the circle?

Matt: Well this is the change. Isn't this like the vertical and the horizontal change?

Lissa: And, if you had x-squared plus y-squared equals r-squared, it would be around the origin. But h and k [of $(x - h)^2 + (y - k)^2 = r^2$] take that centre—

Matt: and just shift it. [He completes my sentence and points to the graph.]

Lissa: Yeah.

Matt: So the centre is (-3, 4).

Lissa: Ah it's in this form, so that's the displacement to get it back to the origin. You have to back it up 3 and move it down 4 to centre it, so when it's off-centre it's at (3, -4). That's why it's minuses, minus h and minus k, in the formula.

Matt: Oh, so this is like. Um. That makes sense.

Lissa: So now what's the radius?

Matt: The radius is 10?

Lissa: Radius squared is 20. What's the radius?

Matt: The square root of 20.

An Analysis of a Miss-take: The “Square Root of 20 is 10”

Deeply embodied habits together with the cognitive challenges of keeping track of and holding in mind multiple perspectives for comparing and contrasting—all can

condition slip-ups. Reciprocal procedures, doing and undoing, and resolving processes and outcomes in singular symbolic representation all invoke these kinds of challenges.

Knowing Matt's history, this seemingly careless mistake affords a window into missed discernments and suggests an answer to the question, "how, in what context, is this thinking right/adaptive/suitable?" The rhizomatic entailments in just the above slip-up can be revealing. Consider the sense that he makes and the habits (prior automaticities) that once worked for him but now want for procedural interruption and literal re/minding.

This particular miss-take evinces implicit awareness and nonconscious attention to analogous parallel structures and this speaks to much that he *does* understand (i.e., what's "right").

The notion of square root and of square each represent an inverse value and an inverse process, one of the other. That is, to take the square root of a number yields a value and both the action of taking the square root and the value-yielded are inverses to the action of taking the square and the value-yielded. The square root symbolises at once value and process. It is ambiguous. Fluidly interchanging these meanings; that is, experiencing process and value, at once, calls for a conceptual resolution of ambiguity.

Moreover, the square root is typically introduced in contradistinction, as opposite, to the square (as conceptually an opposite in as much as it represents both the procedural undoing of squaring and value thus obtained). But the notion of a square can itself be situated in a class of constructs called powers.

Now, powers/roots are generally presented in schools and conceptually arrived at through a tertiary process of building up from addition/sums through

multiplication/products. Notably each of these pairs invoke sophisticated resolutions of respective ambiguities of process and consequent value.

Matt's tendency to read square root as taking the half refers and suggests his tacit awareness of the above relations, but with a habit that fails to tease apart the subtleties. Squares and square roots have been associated and fused to doubles and halves—both set of concepts invariably linked to prior bodily experiences and nonconscious fluidity in doubling identical values.

In Matt's case these tendencies are exacerbated by his prior over-reliance on doubling as a favoured approach to adding. That is, Matt over-learned doubling so that it became for him a well-established nonconscious or preconscious procedural reflex now broadly applied without increased discernment. Put differently, his mind had developed a strongly-established and too rigidly-fixed habit of associating matched values with both doubling and adding—doubling (and counting up) having enjoyed long-time (9-year) usefulness for him as practiced strategies-of-choice for adding (see above excerpts, June 8 & 21, 2009).

Witness here how these first to mind, nonconscious procedural memories take time, repeated conscious interruption to be progressively dislodged and replaced with more nuanced reflexes. Of course under stress or other detractors of attention the prefrontal cortex is kept busy with executive functioning. In the face of all-consuming conscious work, one's mind relies on habit and habit is an entailment of physiological neurochemical phenomenon. One has to grow one's plasticity differently and that, quite simply, takes time and experience, conceptually linked through bodily metaphor to physical engagement. In our case, such opportune moments were severely limited. A

curriculum that marches to a pre-determined beat across a structured terrain does not lend well to the poietic learning of sense-making. Instead it supplants creative moments to the preferred certainty of mimesis and rule-following. As such, learners making inherent conceptual sense or focusing on fixing mindless habits of doing, are quickly dichotomised into the haves and have nots when it comes to mathematics.

Enter affect.

I have previously described my bewilderment when confronted with the substantive fluctuations in Matt's enacted understandings. In particular that which seemed learned one day, and deeply so, often evaporated another, only to return again the next—all for no self-evident reason.

If one could name a pattern it would be that the mathematics of the middle years curriculum, where fractions, integers, and powers had been introduced, were particularly prone to this kind of recoiling. For Matt and many students these are the years riddled with the onset, if not the heightening of anxiety. Here mathematics can no longer be performed particularly well by rote; and perhaps then it is not surprising that these are also the years identified by Matt and both his parents as troubled by ineffective mathematics teachers. And so, whereas Matt's understanding of and affective ease when working with me and the mathematics of primary and secondary school levels held and grew, not so for middle years mathematics—notably also, that review section, in the Grade 10 program of studies, that: we had been pressed to skip through, whose assignments had been completed and submitted half done without my awareness, and for which we prematurely left behind.

These constituted the points of continued, anxiety-provoking reversion. In particular, as explored above, the slips continued and this was despite: patient ad hoc explorations, seeming arrival at deep understanding, and fulsome returns to that deep understanding with but a half-prompt to consider again. All of this evinces an avoidance of that difficult middle-school time period as just traversed difficulty (prior to my arrival) and a preference for the more pleasurable associations of earlier and later mathematics lessons. In any case, the preemptive act of bringing earlier procedural habits into play in structurally similar but conceptually different situations—without availing himself of newly learned discernment—stubbornly persisted, heightening during those times when the rest of his life was anxious too. Their resistance to first being dislodged and then, once seemingly eradicated, their surprising return was disconcerting to say the least. There were indeed more powerful forces at work working him—protective affective resistances.

The work of Singer and Fagan (1992) with infants suggests a way in to making sense of these persistences. Their studies of learning in 2-month-old infants are revealing of learning both as moved by the pleasure of agentic action in the world and as lost to retrieval when the learning is subsequently coupled with negative affect.⁸⁴

⁸⁴ In brief, researchers tied a string to a ten-item mobile and the other end to a toe of two-month old infants. Primed by the researchers who moved their toes to “show the consequence,” these infants, delighted at the movement of the mobile and further prompted by the contingency of its movement in consequence of their toes wiggling, learned what they could do. On the third day of this activity, a two-item mobile was substituted for the ten-item one. Some (roughly half) of the infants showed such extreme disappointment and anxiety as to stop playing and progress from a whimper to all out crying. Seven days later, when presented again with the ten-item mobile, only the infants who had cried had “forgotten” the play that they had learned. However, if primed the day before by the researcher showing the movement, their learning was re/membered. The researchers concluded that these findings suggested, not that prior learning was lost, but that it was not retrievable as a result of the blanketing effect of anxiety. In order to avoid anxiety the children also lost access to the learning that had come to be associated with that anxiety. (Singer & Fagan, 1992)

As a result of shock experiences that lead to the subsequent establishment of filters, our sense of others and of ourselves is dulled. Furthermore, the exposure to and the impact of a variety of shock experiences directly affect our memory of our life experiences. This process has been well document in research that has linked the memory of an event to the affective context in which the event was experienced. (p. 188)

It would seem that Matt evinced more than his fair share of such “shock experiences.” They constituted traumatising events that regularly slipped out of conscious view, but remained ever-present in the shadows working a hazing effect upon Matt’s mathematical thinking.

5 Attachment, Attunement, and the How of *Becoming with*

Having considered in Chapter 4 the affective motivations for acts taken in the world, especially the intrinsic biological rewards inhering in the ongoing act of agentic self-change that is learning, I turn now to the “how” of such change. How do we learn where learning entails our coming to be a doing knowing self? To answer this is to explore the processes of deep autopoietic embodiment from infancy forward and to consider what we might presently agree upon concerning the very processes of becoming self-with-world—from the bottom up, as it were.

I turn to infancy because the consequences of these earliest life choices have sedimented into the children we come to teach, including of course, children who come to express deep anxieties in learning. In the twin challenges of individuation and relatedness as developed in Chapter 4—especially during that nebulous time where sense-making of self with world oscillates between pretend play (with all its elaborate, intentionally-demarcated, constructions of fantasy upon phantasy⁸⁵) and the frightening boundless space of psychic equivalence (where phantasy is world)—a child can grow in the direction of security or, in its lack, contract into self-protective minimalist being.

If risking oneself in learning asks for trust and if we think of a minimal self as wanting for sufficient trust to take such risks, then attachment security (where trust in self with world finds its support, if not inception) becomes a pivotal area of study.

Accordingly, we do well to consider the vicissitudes of what is presently understood about early attachment and first lessons of selfhood. It is here that we might ground a

⁸⁵ Here, I invoke Melanie Klein’s notion of “phantasy” as that which “emanates from within and imagines what is without... offer[ing]... unconscious commentary on instinctual life and link[ing] feelings to objects... [in] a new amalgam: the world of imagination. Through its ability to phantasise the baby tests out, primitively ‘thinks’ about, its experiences of inside and outside” (Mitchell in Britzman, 2003a, p. 43)

scholarly critique of popularised notions and preoccupations about today's western youth and times as particularly and problematically entitled and narcissistic. What is at play in these conceptualisations? What can we learn from them? And how do they implicate present habits of thinking and conditioning education?

Attachment: Origins of the Theory

Under the conceptual influences of hermeneutics, psychodynamics, and embodied cognition, work in attachment has metamorphosed, over the past decade especially, into a sophisticated, nuanced, enquiry programme that enacts and contributes a deep reverence for human life as complex, irreducible, and non-classifiable. Before exploring questions as to the *how* of becoming—the subject of much investigative research arising out of attachment theory—I first situate the theory in terms of its roots, attempting to do so without falling into the sway of that early positivistic universe where attachment patterns, like horoscopes, threatened to become reified realities.

“In ‘Mourning and Melancholia’ and in his other writings, Freud emphasised two components in the etiology of acquired psychopathology: constitutional (as cited including genetic) predispositions and early experiential factors, especially loss” (Kandel, 1999/2005, p. 79). Pioneered by John Bowlby in the latter half of the 20th century, carried forward by Mary Ainsworth and Mary Main especially, and originally (but no longer) rejected⁸⁶ by psychoanalysis (Fonagy & Target, 2007a)—attachment theory, now

⁸⁶ The acceptance of attachment theory into psychoanalysis is a more recent phenomenon. Begun with the work of Bowlby in the 50s and 60s (Fonagy & Target, 2007; Wallin, 2007), forty years later, it did not merit inclusion in the first edition of *Major Theories of Personality Disorder* (Lenzenweger & Clarkin, 2005, p. ix). It appears however in the 2005 second edition. Moreover, Fonagy and Target (2007a) note that original opposition to the theory served to unify the British Psychoanalytical Society (p. 412) and they further cite Kernberg (1976) as among the “major figures contribut[ing] to this opposition” (p. 412). Interestingly, Kernberg and Calgor’s 2005 entry into their chapter of the second edition of the *Major Theories of Personality Disorder* explicitly cites the work of Fonagy and Target in attachment theory,

repeatedly surfaces in at least a supportive capacity in the various literatures describing the etiologies of wellness and psychopathology (see e.g., Banai, Mikulincer, & Shaver, 2005; Cozolino, 2010; Laible & Thompson's, 2000; Lenzenweger & Clarkin's, 2007; & Daniel Stern, 2004).

Influenced by Jean Piaget's cognitive psychology (Wallin, 2007, p. 27), and representing a radical departure from traditional psychoanalytic approaches of the time, Bowlby's emphasis was toward understanding infant attachment as adaptive response to the vicissitudes of early caretaking environments. He did not see development in terms of linear progression through a sequence of phases, with regression as maladaptive response to distress. Instead he posited several lines of development as solutions to the immediacy of early close worlds of experience, but variably adaptive in later and broader contexts.

Prompted by work with homeless and orphaned children in the aftermath of World War II, Bowlby's point of entry into understanding the psyche, the development of psychopathology, and personality disturbance was through the empirical study of "actual life events" in early mother-child relationships (Meyer & Pilkonis, 2005, p. 232). He began by studying the infant need for an attachment bond and the propensity to form such attachments as long as there was a primary caretaker to interact with, even if that caretaker mistreated them. Using "principles from psychoanalytic theory [notably object relations theory], ethology, evolutionary biology, and control systems theory... [he

enfolding it, and recent findings in phylogenetics (pp. 128 & 131), in ways that support psychoanalytic theories of personality development. In terms of attachment theory and relational psychoanalysis, Sonia Buechler (1997)... draws out twelve points of contact... among them are that both theories see emotional problems as the result of interference with an innate potential for interrelatedness, consider the recognition of patterns of relating as crucial for diagnosis and treatment, and view the meaning of behavior in terms of its interpersonal function. (Fonagy & Target, 2007b, p. 415)

argued] that a warm, supportive relationship with a caregiver promotes psychological well-being in infancy and throughout life” (Laible & Thompson, 2000, p. 303).

The principles of attachment theory have been taken up, most notably, in psychoanalytic studies of development—these often self-described in terms of “embodied cognition” and “post-Cartesianism” (see e.g., The Boston Change Process Study Group⁸⁷ and also the work of Fonagy, Gergely, & Target, 2007). The theory has thus evolved considerably from its more empiricist roots. That said, at its mid-twentieth century inception, riding upon the still long-running wave of disembodied empiricism, attachment theory began by creating a crude metric for parsing infant attachment security according to observed responses, across varying scenarios, to a primary caregiver’s presence and absence.

To be sure, in attachment theory’s origins is that human habit of formulating edges and exaggerating boundaries in new ways to conceptually impose a perceived order onto the world in the hopes of better understanding it—where understanding might be thought to begin more-or-less with correlation, causation, and prediction. We do well to remember the imposition—lest the labels thus-construed become the only available “real”, subsequently feeding a school system all-too-eager to assess, prescribe, and strategise away local evidences of, typically, far more socially and culturally systemic concerns.

⁸⁷ Created in 1995... [the Boston Change Process Study Group (BCPSG)] consists of a small group of practicing analysts, developmentalists, and analytic theorists, who share the view that knowledge from the burgeoning field of recent developmental studies as well as dynamic systems theory can be used to understand and model change processes in psychodynamic therapeutic interaction. The group brings together through its members the knowledge of infancy researchers and the experience of practicing psychoanalysts in an effort to study the process of change as it occurs both in normal development and in psychoanalytic therapies. There is now a broad consensus that psychoanalytic developmental theories are in need of drastic revision based on these same studies. (BCPSCG, 2006–2010)

Indeed the habit in educational psychology, it seems to me, of translating etiological research on “becoming self” into ready-made reductionists practices of quickly locating and then fixing different selves, is prevalent if not growing in prevalence in schools. In response to such practices, I support curriculum theory’s position in “*the interdisciplinary study of educational experience*” (Pinar, 2004, p. 2) as advocating against “the social sciences—most prominently academic psychology, but sociology as well”—these seen as having “colonised much of the field of education” (p. 2).

Consider but one such recent evidence of colonisation that problematically uses attachment theory in the service of categorising children and teachers according to levels of security and then technologising the treatment: In “Attachment Theory: Implications for School Psychology,” Kennedy and Kennedy (2004) describe attachment styles as reflecting the needs and mechanisms “for emotional regulation... requiring different intervention strategies” (p. 252). In particular they name an abbreviated rating scale for assessing “teacher–student relationship dimensions paralleling child–parent attachment relationships” (p. 255) and in so doing provide “school psychologists an added dimension of *assessment, relevant to treatment* [emphasis added]” (p. 256). In their vision, “attachment-based assessment facilitates the generation of hypotheses concerning children’s social/emotional history, providing insights into their current behavior within the current context and aiding the development of *effective, individualised intervention strategies* [emphasis added]” (p. 256). I want to be clear: For multiple reasons, not the least of which is the problematic work that this line of thinking prompts in the construction of learners and the foreclosing of possibility, this is not the trajectory of

attachment theory to which I refer in the present study, nor one I, in any way, hope to advance.

From the same origins in early attachment theory, we can trace a different path—one considerably evolved from its mid-twentieth century empirical beginnings and now having significant influence, acceptance, and enfoldment into present day psychoanalytic thought (see e.g., Banai, Mikulincer, & Shaver, 2005; Kernberg & Caligor, 2005, p. 128; Lenzenweger & Clarkin, 2005, p. *ix*; Sandler, 1995). Indeed, in “The rooting of the mind in the body: New links between attachment theory and psychoanalytic thought” Fonagy and Target (2007b) frame attachment theory at a promising hub of mind science and psychoanalysis with the potential to reestablish psychoanalysis’ “position as the premier neuroscience of subjectivity” (p. 446). Would that it as well come to dislodge psychology from its preeminent position in education as the primary informant to understanding human learning and development!

The original patterns of attachment were conceived out of an interpretation and a research design that came to be known as the strange situation. In the strange situation, one-year old children were observed in an unfamiliar playroom under varying conditions: in the presence of their mother and during her departure, brief absence, and return both with and without an attendant confederate, stranger to the child. The strange situation, and theorisation upon and about it, in all its subsequent manifold variation, spawned a research programme around the intersubjective and pedagogical character of the early infant–caregiver relationship.

In brief, Ainsworth classified infant attachment, and at the same time infants and their parents, according to infant coping responses to the strange situation. She discerned

four constellations of attachment behaviour: one tending to secure, two versions of insecure but seeming polar opposites (though arguably only superficially so), and a fourth, much less prevalent, cluster of disoriented behaviours found in abused children for whom the caregiver was ambivalent source of comfort and distress. These patterns, as observed through the paradigm's *early* perspective, were *at the time* seen as: largely set for life, conditioning of future intimate relationships, and pulsating through generations. As such, in a manner reminiscent of Butler's notion of performativity (1990; 1999), according to attachment theory, the patterns that pattern us become those to shape our children and our children's children. And I say this all the while acknowledging that what is featured as a pattern is also consequence of a patterned way of perceiving, one both illuminating and obscuring.

In any case, at its inception *early* attachment theory rendered a bleak picture for the insecure of us. The accepted doctrine was that any breaks to insecure attachment patterns were only effectuated by an able few who, for some unknown reason, sufficiently enacted practices of mindfulness (attention to present moments) and mentalisation (bringing theories of mind and metacognition into understandings of self and others) (Target & Fonagy, 1996). Of course as forewarned above, the difficulty here lies in the theory's early propensity toward fixed categorisations, these lending themselves to being taken up in just this way.

Not desirous of promulgating such classifications, but understanding the seminal importance of degrees of security in attachment (these far more mutable than was originally thought), I rather want to pick up from the rich body of research of the last decade wherein attachment theory joins psychoanalytic in the study of childhood

development, especially as considered from and through the view of embodied cognition.

To reiterate: *Within histories are writ futures, but never in stone.*

Embodying Cognition: Tentative Understandings on the Early Shaping of Selves

Hermeneutics, for Gadamer... moves to the very center of philosophy and is given an ontological turn; understanding, for Gadamer, is a primordial mode of our being in the world... [He] tell us: "Heidegger's.... concept of understanding carries an *ontological* weight. Moreover, understanding is no longer an *operation* antithetic and subsequent to the operations of the constitutive life, but a primordial mode of being of human life itself." (Bernstein, 1983, p. 34)

Understanding is constitutive of the self into which one learns oneself into being.

Turning the lens of Bernstein's phrasing onto my own understanding of the above quotation, I would say that that particular understanding is, in part, constitutive of the present self into which I, at the moment of reading, learned myself into being. It has been a joint self-in-world and world-in-self project. So too, the infant's emergent understanding *is* ontologically self-constitutive and, at the same time, constituted in action. As Carpendale and Lewis put it:

Children's social knowledge is based on action; it is not theoretical in the sense of a set of laws formed on the basis of observation to explain the doings of other people. Understanding others is at first practical. It is gradually constructed through regularities in interaction with others. (2004, p. 84)

In this section and chapter, I undertake a fine-grained investigation of just how this first practical understanding unfolds in the regularities of interaction with others and how it is constitutive of the learner that greets us in schools. The roots of a singular–

plural–self’s making of that self, in a *with* of sociality, set the contexts for making sense of the learner that confronts us in Matt. If we begin to gain a sense of his, or any learner’s, trajectory into being, we will perhaps be better constituted, ourselves, in ways that would move an acting well on both our behalfs.

I take embodied cognition to mean that being as knowing as doing are inseparable, mutually constitutive entailments each of the other. I also understand that the nestedness of systems—of selves composing selves as parts of grander collective selves—confounds any simplistic reading of any single agent effectuating the being the knowing and the doing of a given moment and place. Indeed, I would argue also the inseparability of gestures across systems such that the being–knowing–doing of living cells cannot be teased apart from the being–knowing–doing of the multicellular selves they compose, and that this is the case too, in terms of the being–knowing–doing of the socio-cultural and political community of selves within which each self exists. Still, owing to human limitations, it is well to choose an apt focal point and so I choose a local anthropocentric one: the emerging individual as child born into and developing with world.

What might be learned about how our cognition comes into primal being as and through our bodies? Moreover, in as much as first caregivers are childhood attachment figures, the patterns conditioned in those interactions are prone to re-enaction by learners in subsequent encounters with future adult figures, in particular teachers. Our early history sets a tone (though not in stone) that shapes the colour and hue of affect in relationships sought and engaged over the course of one’s life. It constitutes the

conditioning subtext of transference and countertransference as habits of social engagement.

From Sensation to Sense-Making

To explore the question of infant beginnings, I consider present research on how the relatively diffuse unordered cognition (and by that I include all manner of brain function including especially affect) of infants comes into a more focused coupling of child with world according to an evolving perception of world, where such encounters, in the uptake, co-organise the mind-brain at the same time as they organise a perceived and perceivable world. In brief, I ask: What do we presently understand about the processes by which humans, from birth up, come to cognate themselves into and through their own embodiment? By “cognate into embodiment,” I point to the process of thinking ourselves into being such that the doing of our thinking entails our ongoing becoming into recursive revisions of being. And by “cognate through embodiment,” I point to the body that makes possible its own cognition.

The newborn arrives with but a few innate propensities with which to begin to construe self-organisation—an organisation destined to imposed itself back (and forth), dialectically so, onto (and from) the encountered world. The scarcity of set patterns of mind at birth speaks to an openness of possibility and runs contrary to past assumptions about innate mentalistic capacities and primary “intersubjectivity” in infants—these assumptions quite simply not holding up to the rigour of present empirical study (Fonagy & Target, 2007; Gergely, 2007; Klin & Jones, 2007).

Indeed, in line with the perspectives of social constructionism and embodied cognition, it is now canonical among leading researchers in infant development to assume

that, given no prior experiences in world, newborns begin without intrinsic sense of distinguishable “entities,” neither of self, nor consequently of others, objects, and world (Carpendale & Lewis, 2004, p. 87; citing among others: Merleau-Ponty 1964; Piaget 1936/1963, 1937/1971; Vygotsky 1998). The child develops these distinctions by way of participation in an “activity matrix made up of biological, social/cultural, and psychological dimensions” (Carpendale & Lewis, 2004, p. 82). Neither, apparently, are young infants introspectively aware of their emotional states:

Many researchers of early emotional development (often of rather different theoretical persuasions)... share the view that differentiation of discrete emotions and/or their conscious access are not yet present during the first few months, but are either the consequences of early self-organising dynamic systems processes (Fogel et al., 1992; Lewis & Granic, 2000) or, alternatively, of cognitive developmental processes leading to the early socialisation of, and sensitisation to, differential internal emotion states during affect-regulative caregiver–infant interactions (Gergely & Watson, 1996, 1999; Sroufe, 1979, 1995). (Gergely, 2007, p. 52)

Any coordination between internal states and their behavioural expression are thought to be consequences of primary biological adaptations and not reflective of any conscious subjective intention (Fonagy, Gergely, & Target, 2007, p. 293). Yes, infants express basic emotions. And yes, they experience interoceptive sensation. But, the point is that, at birth, “*the ‘constitutional’ or introspectively ‘invisible self’*” as Gergely puts it (2007, p. 58) is characterised by genetically informed, and environmentally occasioned (where the close environment has been uterine), differences of individual temperament—these expressed

according to a limited set of “primary” and “universal,” “pre-wired,” “stimulus-driven” emotions, as “procedural behavioural automatisms... not accessible to conscious awareness and over which the baby has no voluntary control at first” (Gergely, 2007, p. 58).

A seminal question then asks how, under the conditions of such sparse beginnings, any sort of first sense might begin to be made. Without “first sense” where is the understood experience, the feeling cognated in and on emotion, through which one might construe subsequent sense to be memoried and historied forward into and as self? How does parental *mirroring* work with newborn tendencies to effectively begin a trajectory of becoming with? Where resides first meaning, if there be such a thing? The past decade of research points to tentative answers to these questions and to questions about how, out of fundamental visceral organisation and propensities, the characteristic human patterns of growth and development emerge. The answers promise to lend insight to key pedagogical concerns as hover around motivation, engagement, anxiety, and agency in learning.

Begin then with the recognition that, although absent self-awareness in any introspective sense, the infant is, in a manner of speaking, neither without the ability nor the inclination to engage causative acts. That said, but for a few guiding principles (as articulated by e.g., Carpendale & Lewis, 2004; Csibra & Gergely, 2011; Fonagy, Gergely, & Target, 2007) and barring the prior smoothening of movement in utero (Piontelli, 2006, pp. 393–403), such acts bear the countenance of being, initially at least, engaged randomly. Significantly, haphazard neurally instantiated movements do come together at times such that they are experienced in temporal fluidity (for instance causing

a muscular contraction that initiates movement or sound). Given that these spontaneous orderings, when they occur, are accompanied and followed by proprioceptive and exteroceptive sensed experience—these, biologically rendering neurochemical reward—then such proprioceptive and exteroceptive consequences of coordination and coherence become likewise neurally (and conceptually in a rudimentary sense) paired with that reward so as to themselves become rewarding. In this manner, “rewarding” and “rewarded” enactions entrain together, physiologically, giving rise to their strengthening (see Edelman, 2003 on *neurochemical value systems*, notably p. 102; for fetal development see Piontelli, 2006, pp. 401–403).

Consider that the experience of relatively smooth (efficient) movement is recursively refined, in for example an act such as a thumb finding its way into the mouth. That smoothness of enaction is itself rewarding, as is the suckling instinct satisfied, and subsequently all manner of associations conditioned in the co-experiencing of warmth, mother, milk, and suckling. The “emotional” (neurochemically felt) and “feeling” (cognitively linked; see Chapter 3) rewards, thus engendered, in turn reinforce neurological entrainment and bodily memory (embodiment) in manner as to encourage further association and repetition, enacted as habit—the entire network of relationships becoming further memoried with feeling (recursive loops of cognition onto emotion) and generative of a possibility for conscious intention. As Fonagy writes, cognition can be thought “the residue of the actions of an organism upon the environment” (2007, p. 42).

Taking the central constructivist perspective that “knowledge originates in activity,” Carpendale and Lewis (2004, p. 87) describe the above scenario in terms of actions schema:

Infants interact dyadically with the world of objects as well as with people, and through this activity they develop sensorimotor action schemes. Such schemes embody knowledge because they are modified as a function of the differences between what is anticipated and what the infant actually experiences (Chapman 1999). (2004, p. 87)

I would add that “what is anticipated” must needs originate out of prior experience. Moreover, where “meaning” is affect spun into contingencies of acts upon, and experiences from, world then any “meaning” the neonate “assumes” in regard to what he experiences also must originate out of prior experience. But how does any “first” experience come into shaping?

For the newborn, and the fetus before that, every moment, every instant of being in the world is a moment of myriad co-occurring sensing of, for example, texture, colour, and contour of variations and emerging capacities for sight, smell, and sound. Experientially bathed in unorganised concerts of sensation, the infant organises self with world. That is, she learns herself into being according to the regularities of the world as experienced. In a kind of neural-noticing-become-experiential-being, unorganised “concerts” entrain into coherences on the principle that neurons that fire together wire together (Edelman, 2004, 2006). In other words, co-triggered neurons become temporally and structurally bound into physiologico-experiential associative networks primed for subsequent co-firing. Accordingly, first lessons on and from the world entail sensations that converge into coherences in as much as these sensations are co-occurrences triggered with some measure of regularity by that world. In this way, and prior to any hint of the symbolic, assemblages of self take their cue in a coupling of self with world.

Carpendale and Lewis describe the bundling of bundles, neurally and experientially as mind. They write,

With further development, two or more action schemes may be combined, resulting in more objectivity or separateness from the infant's own action. The infant develops expectations about what can be done with objects as well as expectations about their interactions and routines with people. (2004, p. 87)

The conditioning of expectation is physiologically constituted with world in ways to subsequently and reiteratively condition further expectation. Out of “early sensitivity and motivation to explore and analyse the causal contingency structure of interaction”

(Fonagy, Gergely, & Target, 2007, p. 292) infants come to enact *will* and *intention*.

Indeed, observations summoned from across neuroscience, psychodynamics, and infant studies converge on a narrative recounted here of emergent expectation, contingency seeking, and neurochemical reward systems that reflexively and recursively shape a biological propensity in infant sense-making that has every bit the countenance, if not the essence, of agentive curiosity.

Gergely writes, “Irrespective of the social or non-social nature of the stimuli.... [i]nfants show positive emotional reactions when discovering their causal influence over an external event and exhibit frustration when their contingent control is lost” (2007, p. 54).⁸⁸ Put differently, infants like to test reactions, to explore the consequences of their acts, and thus experience, hone, and learn from that enacted agency in a contingently responsive world. Such enquiry undertaken by infants, and we may call it that, characterises what Gergely has named “contingency detection behaviour” (2007, p. 60).

⁸⁸ As mother of two, I marvel that we need research to tell us this, but there it is nonetheless.

If the consequences of “choices” sediment, then first sedimentations become the most rudimentary and ensconced. *Deep etiologies matter*. They tell of seminal self-paths laid in walking—of beginning ontological becomings as neurophenomenological emergences made of epistemological engagements with and embodied interpretations of world. How then do such unabashed infant enactments of self into self (albeit tempered by what that self can do with itself) ultimately come to reshape past and future in ways to open possibility for some but foreclose it for others?

To summarise and move the point forward: *Though anxiety may come to shackle nimble curiosity with a heavy weight in later life, it seems none of us begin that way*. Infant agentive curiosity begins as lithe, unfettered, and biologically primed predisposition to try out, explore, and follow contingencies. Something happens in the unfolding child-world space, beginning with the intersubjective child–caregiver dyad—expanding and recursively elaborated upon in familial spaces, neighborhood, community, school, and culture—that pulls back into anxiety, for some, in an almost over-tempering moderation of childhood curiosity and courage. If as Winnicott posited, our sense-making is world-making according to the illusions we construe, then have the most anxious of us been *too long* assaulted by a disillusioning world? Notably the condition of “too long” is a perception made, after the fact of anxiety and as articulated in relative and retrospective terms of “too long for us.” At which point, one might ask after the space for and enticement to play at sense-making. How might it have fallen short—or given worldly circumstances, how could it not but have fallen short? And, what might we do about that?

Gergely’s research places contingency detection squarely in the realm of the social. He describes a “prewired contingency perception device... [that] automatically

monitors and assesses over time the degree of contingent relatedness between the infant's responses and events in the external (social) stimulus environment" (p. 60). By noticing the matching of caregiver acts in time, space, and intensity, the infant begins to identify the elements of "the social environment that are under (some degree of) *causal control* of the infant's state expressions and behavioural displays" (p. 60). Crucially,

The degree that the social environment exhibits systematic and differential contingent reactivity to the baby's particular types of responses, the consequent discovery of being in contingent control over the social environment generates an experience of causal efficacy and self-agency in the infant. (Gergely, 2007, pp. 60–61)

In other words, the way the world meets and responds to the "serious play" of the child significantly anticipates and conditions the nature of future agentive acts in learning and the security felt of a sufficiently responsive and predictive world. Moreover, if we take in earnest Mead's definition of the symbolic meaning of a gesture as residing in the response of the other (in Klin & Jones, 2007, p. 11; see above), then the infant inclination to contingency detection, where such acts are undertaken in a social world, presages and prompts the development of symbolic meaning and language.

Apart from the above precursory agentive acts, researchers note certain innate, predisposing, universal, social tendencies characterising human infants (regardless of, and prior to, race, culture, or creed)—these summarised as follows: (a) preferential attention to the human face that, within the first two months of parental interaction, localises to a greater preference for the more expressive parts, in particular the eyes (Carpendale & Lewis, 2004, p. 86; Fonagy, Gergely, & Target, 2007, p. 292; Klin &

Jones, 2007, p. 16); (b) a preference for “speech sounds relative to other environmental sounds from birth or soon thereafter (Mills & Melhuish, 1974)” (Klin & Jones, 2007, p. 16); (c) a preference in human speech for “motherese... the particularly salient and specific type of ‘marked’ speech intonation pattern” of infant-directed speech (Fonagy, Gergely, & Target, 2007, p. 308); and (d) an inclination to imitate certain facial gestures, including a tendency in the latter part of the first year to follow gaze shifts when these are preceded by eye contact (Fonagy, Gergely, & Target, 2007, p. 292).

In sum, the inclination to contingency detection, the preferential attention to facial expression and communicative cues (eyes, head, voice) especially from a favoured caregiver, the biological proclivity to neural and conceptual assemblage (a kind of noticing into habit and awareness), and the neurochemical reward systems prompting particular learning trajectories—when taken as an interactive whole—afford clues to understanding the universal biological predispositions that enable and constrain each newborn’s autopoietic path into its ownmost being with the world.

Importantly, understanding that the infinitude of these early shapings of selves (across a limited range on the possible) elaborates into the hugely complex beings that greet us in the classroom, what can we take from attachment research to inform a pedagogically-open countergesture that also greets and gives audience to prompt the spirit of life in each child? Surely we have exceeded any promise given of the further categorising of children. And surely, there is reason to disband the rather futile project of micromanaging teaching acts fitted diagnostically to student behaviour or type. This is not a quantifiable moment. Rather wisdom, *phronesis* not *techne*, is called for—wisdom arising from and steeping yet in ever-deepening understandings, long past the

uninterrogated Cartesian assumptions of yesteryear. Indeed, just as psychoanalytic practice draws from present work in infant studies, so too ought we (and the point here is not to negate other *oughts*) in education consider what we might learn—and this is an ought I do insist upon!

Given the above-described early infant tendencies, consider now the reflective adult counterpart in co-conditioning the trajectories of early dyadic interactions.

Secure Attachment and Mentalisation: Possibilities for Courage and Humility

To begin with, note that the above findings arising out of attachment research, being more recent, ride atop a tradition of over 30 years of study affording significant support for what may seem intuitive: that deep disturbances in early parent–child relationships spawn insecure attachment and increased risk for later psychopathologies” (Leckman, Felman, Swain, & Mayes, 2007, p. 104). Conversely, an early relationship with a caring adult confers, even onto otherwise high-risk perinatal infants, a degree of resiliency and protection against such future psychopathologies (Werner, 1997 & Werner & Smith, 2001 in Leckman et al., 2007, p. 104). Significantly, though perhaps unsurprisingly, the quality of caregiver-to-infant responsiveness traces *in part* to the caregiver’s own childhood history and attachment-related experiences (Leckman et al., p. 104).

Of particular interest in this context, is recent theoretical and empirical work into the infant–adult relationship characteristics associated with attachment security and the processes by which these relationships seem to shape the experiences and expectancies of the developing child. Detailed studies of infant–caregiver exchanges increasingly highlight the all-important function of micro-level matching of parent–infant affective

states. Micro-synchronicity is effectuated dialogically, through gesture and symbolic gesture that evolves to language (see Wittgenstein in Klin & Jones, 2007), where infants begin by enacting particular species-specific predispositions (see Csibra & Gergely, 2011 on the *natural human pedagogy*) in response to parental expressions of attunement (Leckman et al., 2007, p. 105).

It is through such attunement that the child becomes privy to and learns herself into a particular way of being and reacting in the world. And, it is through such attunement that the caregiving pedagogue crucially gives audience, both in the sense of a separate witnessing presence and through the mirrored echo that affirms the infant's presence. The experienced co-presence of child and caregiver, rendered in good-enough affective attunement, where the caregiver can and does give audience to the child, also fulfills a containing function: The child experiences, in an attachment figure able to be present as audience, the enfoldment of a safe-enough haven for self and world-exploration in and through enticing play.

Importantly, the mirroring and containing presence of the caring adult while giving the child herself, also relieves that child of two heavy burdens: (a) the responsibility of omnipotence with its accompanying fear that fantasies are world-making and (b) the expectation of omniscience where a mistaken belief—that what I know already resides in the world and so the world too must know—turns back on itself in an anxiety-provoking demand that if it is in the world, then I *must* know it. Where audience is thus given, the child can follow curiosity, playing the self at and in the scripts that this “theatrical” holding environment (of an Winnicottian sort, 1971/2005; Milner, 1987b) offers up as possibility.

Whereas it would be difficult for a primary illusion of omnipotence to survive the infant's physical limitations of coordinating purposeful acts of and on self and world, in affective realms, a sense of omnipotence can and does survive, in some more than others, as an uncontested burden: Without a sense of the other's mind as different and independent, as in a nascent theory of other minds, the infant is left to flounder with the assumed burden of responsibility for affect construction and regulation of the caretaking other. This is particularly the case where the caretaking other fails to communicate mirrored affect, marked as pretend. For example, the frustrated child wants a cookie and the parent mimics the child's expression in acknowledgement that also announces that the parent does not feel the same frustration, and that, indeed, the child can trust that the parent has the child's best interests in mind, even when the child is upset. When the caretaker marks her mirrored affect as "not real" the child sees both himself through mother's eyes and mother as separate and therefore potentially containing.

In contrast, the saddened child, if encountering the contingent response of a likewise saddened adult, experiences his or her affect as frighteningly contagious. The child in such a situation becomes responsible for the parent's emotion. Where this characterises repeated infant-adult relations of significance, early omnipotence would survive to make demands and expectations of omniscience: Anyone who is all-powerful must also be—indeed insists on being—all-knowing or at least all-informed. In turn, anyone who is all-knowing cannot recognise as legitimate, much less submit to, worldly demands to know differently; that is, to learn. Thus, the two demanding expectations of omnipotence and omniscience, working in tandem, ask the impossible and set up an

erosion of healthy narcissism into a more compromised, defensive stance of minimal, narcissistic selfhood.

In short, in contingently afforded responses (in good enough measure, notably not 100% contingency) that are mirrored, marked, and containing the child finds both the limits of his omnipotence and the safety of a trusted caregiver. It is worth repeating Jessica Benjamin's understanding of the containing function of mirroring:

Only the child who forcefully expresses her anger and finds that the other 'survives destruction'—neither retaliating nor withdrawing—has the opportunity to learn that the other is, in fact, a separate subject rather than an object. (in Wallin, 2007, p. 56)

Thus, the attachment figure who regularly fails to mirror a marked, safe, and contained re-rendering of the child to the child, leaves that child, unseen in an inconspicuous void, bereft of encounters through which to learn about and demarcate the edges of self. As such, self-boundaries remain conflated and indiscernible. The child experiences an unruly boundless self—but significantly, a self that he has not yet had opportunity to know. Moreover, absent any sense of “where I end and you begin,” there can be no limit to this self that one does not know, nor does there exist another against which to compare and contrast such an existence. Given these kinds of challenges to becoming self, it may come as no great surprise that attachment insecurity tends to be a transgenerational phenomenon. The finding that insecure children are likely to become insecure adults who are likely to, in turn, condition insecure children may well be expected. What is however interesting is that early signs of mentalisation seem to be associated with resilience in

children who, bearing the weight of adverse early life conditions, “have reasons” otherwise to be insecure.

In “Playing with Reality: I,” Peter Fonagy and Mary Target address Freud’s notion of psychic reality in a developmental perspective (1996). Though it is the case that, from the first month of life, a child is intensely concerned about the social world (p. 218), that child’s experience of (and in) any interpersonal reality critically shifts over the first years of life such that, by about age four, a theory of mind (mentalising habits) is clearly evident—that is, the child can and does explain actions by attributing mental states (goals, desires and beliefs) to the self and to others (p. 218). Fonagy and Target summarise the gradual development of mentalising capacity, beginning with precursory behaviours of “pointing and looking, or checking back for the caregiver’s reaction to strange situations... in the first year of life” (pp. 218–219) to by age 3, distinguishing between dream images, thoughts and real things and playing pretend games. Noting however that “the 2- or 3-year-old’s awareness of his or her inner world is markedly different from that of a child in his fifth year” (p. 219), they propose a dual character of the very small child’s sense of psychic reality: A “psychic equivalence” mode of interaction whereby the inner experience is thought to be equivalent to external reality and a “pretend” mode of play where “even the young child sees his mind as representing ideas, desires and other feelings” and where a metaphor of picturing imaginary situations or objects “in your head” is readily understood (p. 220). Importantly, they observe that the confounding of these two modes in the young child is clearly threatening and indeed typical at some point, making of this time of life, a precarious one.

In Fonagy and Target's recounting (widely supported by developmental researchers) the capacity to mentalise (marking reflective ability) is reached by the fourth and fifth year. At that time, children are generally able to integrate psychic equivalent and pretend modes of experience and interaction, making possible the creation of a fully mentalising psychic reality. Reaching that developmental capacity in sufficient measure, Fonagy and Target tell us, requires, in their model, that a significant other afford the possibility of the child's repeated experience of three things: (a) his or her current feelings and thoughts, (b) that these mental states are represented (thought about) in the object's mind (i.e., in the "other's mind," but to the child this adult other is cognated in mind, that is, as internal object), and (c) the containing (safe) frame of an adult's reality-oriented perspective (p. 220). Of the adult frame provided, they write, "The child needs an adult or older child who will 'play along,' so that the child sees his fantasy or idea represented in the adult's mind, reintrojects this and uses it as a representation of his own thinking" (p. 220).

Notably, one might think of this emerging mentalising capacity, or theory of mind, as that awareness to challenge the primary illusion of omniscience. The one-year-old who becomes angry when an actor refuses to share a toy, but not when that actor is unable to do so, is a one-year-old with a emergent theory of mind. Even as early as 5 or 6 months, infants seem able to attribute goals and dispositions to help explain and predict the actions of another (see Fonagy, Gergely, & Targets, 2007, p. 295 for examples). That infants, even in their first year of life, show implicit understanding of intentional action is by now fairly well substantiated. Of greater controversy however is the nature of abilities

and the implications when it comes to early psychological reasoning (Fonagy, Gergely, & Target, 2007, p. 295).

In any case, Fonagy, Gergely, and Target explicitly join other researchers (2007, p. 295) in considering mentalisation as candidate for “the evolutionary pinnacle of human intellectual achievement” (p. 295). Specifically, *mentalisation entails inhibitory controls that enable the suppression of an initial, naïve, and overriding assumption: that we all share the same experiences, knowledge, and beliefs*. Notably, neuroscience supports a putative link between feeling and thought: “The majority of brain structures subserving social cognition appear to be also implicated in the processing of emotions (Grady & Keightley, 2002)” (Fonagy, Gergely, & Target, 2007, p. 295). The realisation of difference entailed in mentalising capacity opens the self to the existence of separate minds (Leslie, 2000; Perner & Lang, 2000; in Fonagy, Gergely, & Target, 2007, p. 294), and in concert with emotional processing, is considered to underpin empathic response to the feelings of others (Vollm et al., 2006; in Fonagy, Gergely, & Target, 2007, p. 294). As it turns out, even “processes as basic as gene expression or changes in receptor densities are influenced by the infant’s experiential world” (Fonagy, Gergely, & Target, p. 291). Ultimately, attachment moves to centre stage when we begin to appreciate its role in the organisation of brain processes in ways conducive to collaborative cooperative existence—in short, in learning to inhabit well the singular plural condition of human being.

The relationship emerging in the literature between attachment, mentalising, and social cognition holds significant promise in terms of furthering a deeper appreciation for what is at play in teaching, learning, and childhood development. To summarise current

research has it that: *(a) The attachment system is activated in times of threat; (b) Threat is that which sabotages mentalising capacity; and (c) Mentalising capacity is that which opens the possibility of simultaneously grasping and living fully within the rich paradox of multiple narratives on experience.*

Notably, “a stable, secure, predictable attachment relationship may be most effective in pre-empting threat and probably obviates the need for the frequent activation of the attachment system” (Fonagy, Gergely, & Target, 2007, p. 299). In terms of learning, a securely attached child rallies greater confidence in tackling challenges and in sharpening ability in the rigours of effortful practice. Conversely, “an unpredictable, insecure caregiver–infant relationship is likely to call more frequently for the activation of the attachment system... and thus more frequently bring about the deactivation of neural structures underpinning the mentalising aspects of social cognition” (Fonagy, Gergely, & Target, 2007, p. 299). *Under conditions of threat the child whose attachment system has been rallied, has not the resources to think and act creatively.* Instead, the duress of impending emotional crisis presses a need for security. *Without appropriately attuned support from an attentive teacher or supervisor, previous coping habits honed in insecure environments are triggered.* Consider briefly how these findings might be relevant to mathematics anxiety and to research on mathematics knowing, learning, and teaching.

In Lampert’s acclaimed 1990 report on knowing and learning in mathematics, she described how she acted to create and maintain a participatory culture of mathematical enquiry in a Grade 5 class (and she is not alone, since then, to offer such exemplary narratives of “success”). The point of the study was to show “how it might be possible to

bring the practice of knowing mathematics in school closer to what it means to know mathematics within the discipline” (Lampert, p. 29). Citing Lakatos and Polya, Lampert maintains that,

From the standpoint of the person doing mathematics, making a conjecture... is taking a risk; it requires the admission that one's assumptions are open to revision, that one's insights may have been limited, that one's conclusions may have been inappropriate.... Courage and modesty are appropriate to participation in mathematical activity because truth remains tentative, even as the proof of a conjecture evolves. (Lampert 1990, p. 31)

Yet, despite the overwhelming success of this initiative, Lampert goes on to present what she terms as resistant “nonmathematical ways of knowing mathematics in school” (pp. 55–58), citing examples of these behaviours from the students in the study. These behaviours might best be reduced to avoiding one’s own sense-making and instead deferring responsibility or otherwise relying on, or even demanding, algorithmic procedures to be followed under strictly circumscribed conditions.

My point is that even under these research conditions—in a school and district supportive of an attitude where students are expected to be the authors and discerning, rational adjudicators of ideas in the discourse structures of the various disciplines (p. 58)—there continued to exist students who did not shift appreciably from a preference for what Lampert calls less “authentic mathematical activity” (p. 59).

Significantly, Lampert treats courage and humility as teachable “social virtues” (p. 59). Yet, 22 years later we seem no further ahead when it comes to classrooms of mathematics learners (see Chapter 2). I contend that the manner of approaching knowing,

teaching, and learning in general; the degree of emotional and social support sufficient to buoy risk; and the extent of vulnerability called for in engaging mathematics with sufficient measures of courage and humility may well prove too elusive, especially for the more anxious student, given that these students learn in similarly anxious schooling structures with teachers and administrators alike often seeking assurance of that which cannot be given with certainty. Such issues seem much less about mathematics in particular and more about something much larger at play, characterising a Cartesian ethos, and unsurprisingly reflected in the socialising structures in homes.

The anxiety to be addressed, is both Cartesian and Narcissistic, and addressing it will press a paradigm shift toward giving up aspirations to absolutes of rightness and disembodied truth—doing so without slippage into an abyss of relativism, but rather standing firmly in and living according to a principle of fitness and good-enough that begins with the radical-acceptance of an over-riding life principle of sufficiency. Of course, acceptance of a self has its first possibility in the visibility and acknowledgement of that self in a mirroring other. For this reason, to be further developed below, early lessons in being prove central to informing any revisioning of the educative project.

Klin and Jones (2007) consider the process by which “other people become our natural mirrors” (p. 37): With the exception of the unidirectional quality of our visual system, human sensorimotor “systems typically act in pairs or in self-referential ways—for example, we talk and we hear, we touch and we feel, we move and we balance” (p. 37). If the meaning of a gesture is in the reaction of the other—as per Mead’s account of the emergence of mind (Klin & Jones, p. 37)—then the expressive visible gesture becomes symbolic proxy for the mirrored response of a first other.

The fact that the emergence and evolution of a symbol is tied to actions of adaptation, which in turn are immersed in a context of somatosensory experiences, salience, and perceptually guided actions, makes the symbol a proxy for these elements of the action. *When we uphold and manipulate symbols in our mind, therefore, we are also evoking a network of experiences resulting from a life history of actions associated with that symbol* [emphasis added]. (Klin & Jones, 2007, p. 37)

Infant self-perception is initially very much dependent upon the synchronicity, virtuosity, and radical-legitimacy returned by the mirroring adult. In this way, through a kind of visual proprioceptive feedback, other people's eyes act as our natural mirrors, first literally and then symbolically and metaphorically giving audience or failing to give audience that validates a self-in-process. These first mirroring patterns condition subsequent meanings taken of the mirroring other as we learn to adjust our actions to the ongoing demands of a social world (Klin & Jones, p. 37).

Finally, and significantly, the transgenerational transmission of attachment patterns seems to have everything to do with reflective function, that is with mentalising ability (Slade, Grienenberger, Bernbach, Levy, & Locker, 2005) and the crucial role of pretend play as involving mental representations to establish alternative realities (Fonagy, Gergely, & Target, 2007, p. 300). Though unlikely to be causally related, attachment security and mentalisation seem to have shared facilitating influence when it comes to parenting: Fonagy, Gergely, and Target report that mothers who

take a psychological perspective on their child, including maternal mind-mindedness and reflective function in interacting with or describing their infants

tend to be associated with secure attachment and mentalisation in their children.

(2007, p. 301)

Both the familial conditions conducive to secure attachment and those promoting mentalising are associated with an increased tolerance for negative affect, with secure attachment marking the capacity to reflect on intense emotion (Sroufe, 1996; in Fonagy, Gergely, & Target, 2007, p. 301).

Interim Educational Considerations

The implications of the above findings do intrigue, begging the question of whether, or to what degree, those students and teachers found to be particularly “courageous and humble” when it comes to putting themselves at risk in mathematical discourses are those self same individuals who began life in particularly privileging environments supportive of secure attachment and mentalising function. So, should we begin a program to teach parents how to be better parents? Do these findings warrant tracking students according to levels of security? I surely, surely hope not! The point I am trying to bring home, though sometimes perhaps in round about ways, is that mathematics anxiety is ultimately not about the mathematics.

Too, I wish to prompt our own mindfulness about who we name courageous and humble, inferring from those attributes some sort of moral superiority. It strikes me that the child who finds and then clings to “nonmathematical” ways of coping with mathematics, exhibiting perhaps wild displays of bravado in the process, is not likely lacking for courage nor humility, but rather is in want of enough security in self- and other-understanding (as afforded in mentalisation) and acceptance, to relax into a place of relative safety where terrifying threats to one’s value are held at bay, even for just a little

while. The point is that as pedagogues and moderators of curriculum, we do so in interaction with children, where insecurities of teachers and systems and learners collide. How can we learn from these scenarios to teach well our teachers and our students and our selves with mindful attention to our vulnerabilities and the minimal selves co-existing in all of us alike? How might we, could we, engage a collective shift in being that we could reach out and thus encourage the reaching out of others? And yes, there's the rub indeed. For pedagogical responses to vulnerabilities do not necessarily follow from the fact of them. It just isn't that simple.

Still that something is difficult, even at times seemingly impossible, is not cause to abandon addressing it nor to reduce our study to something more efficaciously accomplished. In that resistance, Winnicott speaks well my own thoughts:

It may be noticed that I am concerned with unconscious motivation, something that is [still] not altogether a popular concept. The data I need are not to be culled from a form-filling questionnaire.... This where those who have spent their lives doing psychoanalysis must scream out for sanity against the insane belief in surface phenomena that characterises computerised investigations of human beings. (Winnicott, 1971/2005, pp. 192–193)

It seems that the questions I pose are the same ones being addressed in much of the psychoanalytic literature written for analysts who increasingly understand themselves and their work as co-implicated, self- and other-transformation. Briefly consider, for now, one such author:

In his book, *Transforming Narcissism*, Lachmann (2008) begins with a consideration of the processes of transformation, where transformation occurs across

development as a “constant state of active reorganization” (p. 13). Drawing from infant research he points up three principles of transformation applicable to the therapeutic situation: (a) ongoing self-regulation and interactive dyadic regulation, (b) disruption and repair of expectations in experiences in infant–caregiver interactions, and (c) moments of heightened affect where one’s validation of another’s affective experience is transformative in itself and where such affective validation is reciprocally transformative across the dyadic relationship (pp. 14–17). Lachmann writes, that studies of these three principles from mother–infant interactions “can shed light on similar patterns of interaction that occur in therapy and in life, generally” (p. 17). Indeed, these same principles do surely have implication for teaching yet, in contrast to research on the therapeutic relationship, there is very little of these sorts of insights making their way into educational discourses.

It has become near canonical that “attachment security is a resiliency factor across the lifespan” (Leckman, 2007, p. 105). Children come to school with varied histories and tendencies to contextualised securities and insecurities. Important to educational contexts then will be the question of whether or not, and to what degree, the work we do is mindfully adaptive and more than superficially responsive to the manifestations of security that our students present. One might expect that a deeper insight from infancy research on childhood development would help inform the ways we address the needs of children in the design of schools, the preparation of teachers, and the enactments of curricula. That said, I in no way mean to imply that we should, could, or would ever want to assess (label and treat) such a construct as attachment security. Rather, I posit that the pedagogue, in many ways, inhabits a role of pseudo-parent and caring attachment figure

in enculturing the child with and in the world. Winnicott himself said as much (1971/2005, p. 17 and especially in “The Place Where We Live” pp. 140–148). As such, we too, in education, might do well to turn to developmental infant studies as informative of shaping a notion of something we might call the “good enough” teacher as like the idea of the “good enough” mother—present, absent, and returning (literally and conceptually) in ways that “give voice to the child’s inner experience allow[ing] her to make these experiences real and manageable... thus leading both to the development of coherent internal working models⁸⁹ as well as the emotional balance and flexibility that is intrinsic to child security” (Slade et al., 2005, p. 294).

For now, I am encouraged further by ongoing evidence of the resilience and plasticity of the human brain and mind. Intervention studies in at-risk situations, both in early childhood (see reports of such studies in Leckman et al., pp. 105-108) and in adoption contexts (see especially Steele et al., 2007) show effectiveness in supporting and enhancing parental sensitivity and, with it, child attachment security. Steele et al.’s work follows the more recent studies of parental representations of the child (2007, pp. 184–185) and certainly bears relevance in terms of teachers’ representations of students (and, for that matter, perhaps even administrators’ representations of teachers, and

⁸⁹ The construct of the internal working model in attachment theory, follows from Melanie Klein’s notion of object relations. These models, first shaped in early attachment relationships (but continually evolving in concert with the various attachment relationships across a lifetime) comprise the child’s learned understandings about her own self-worth and the dependability of others to provide needed attention and care. Kennedy and Kennedy usefully summarise the thinking around internal working models (IWM) as follows:

The IWM provides mental representations of self and others and is the mechanism by which early experiences influence the quality of later attachment relationships. With development of language and cognitive abilities these representations become more elaborate, stable, and symbolic (Bretherton & Munholland, 1999). They form the basis for expectations of dependability and responsiveness of others and affective tone within interpersonal relationships (Cicchetti, Toth, & Lynch, 1995; Main, Kaplan, & Cassidy, 1985), both within and beyond the family. These representations are viewed as guiding and structuring cognition, language, affect, and behavior through the development of strategies, both adaptive and maladaptive, for coping with stress and seeking social support (Cicchetti et al., 1995). (2004, p. 248)

“stakeholders” representations of schooling personnel). Steele’s et al.’s findings with the “late-placed” adopted child⁹⁰ showed “for the first time, that a mothers’ thoughts and feelings about adopting a previously maltreated child can be predicted by their pre-placement thoughts and feelings about their own attachment history” (2007, p. 179). In particular, mothers describing their own attachment narratives in “coherent, organised, reflective [terms]... bring some of these strategies to the discussion of their newly placed adoptive child and [these mothers] are less likely to be overwhelmed with feelings of anger or despair” (p. 179).

Commenting on this work, Slade notes the centering effect of “essentially secure and positive attachment representations” on adoptive parents’ enacted intentions—these intentions often motivated by “profound rescue fantasies... both conscious and unconscious” (2007, p. 188). Rescue fantasies and a narcissistic need, temporarily assuaged by bouts of rescuing, are undoubtedly at play, especially amongst those of us, myself included, in the caring professions. I do not claim myself nor my work as escaping this status. I do notice however that the more securely aware I seem to be able to grow myself in time, the less viscerally urgent is any impulse to save. I take this to be a good sign. As I find ways to give grace within, to say yes, me too, the more well I seem to become, where wellness feels a kind of peace oddly noticed in the tenor of the voice I speak now as against one before. I feel this in myself. So I continue to work at the difficult in me, but not obsessively so (anymore) that I might be well with others, especially, in this teaching, researching vocation.

⁹⁰ Steele et al. (2007) worked with 43 mothers (mean age of 40 years) and 61 adopted children ranging from 4 to 8 years (mean age of 6 years) who had “all suffered serious adversity, including neglect, physical abuse, and sexual abuse” (p. 164) and who had had a previous placement history of 2 to 18 different homes.

In that regard, and having been a myself a “late-adopted” teen, I found it most heartening to read that, at least in this study, the majority of the adopting mothers presented as secure in relation to attachment. Moreover, the combined findings that “parent’s representation of the child plays a key role in prediction outcomes” and that it seemed possible in some cases “for parents with insecure attachment histories to develop positive representations of their children” has, I think, particular relevance to teacher education programs; that is, if we consider the role in many instances of teachers as attachment figures for their students.

In my experience in teacher preparation, “profound rescue fantasies” are indeed not uncommon among would-be teachers. By the same token, I have been saddened more often than I wish, by negative representations of students being expressed among overwhelmed staff as part of a constellation of coping strategies in response to a construction of schooling as increasingly about learner privilege and diminishing teacher agency. I do conceive these tragedies as entangled in the continuance of what Britzman (2003) has described as three cultural myths in the situated practice of schooling: “Everything depends upon the teacher; the teacher is the expert; and teachers are self-made” (p. 223). It would seem that these myths are indeed made to be the case. Ultimately then, any dissatisfaction with student learning falls to the sole responsibility of the teacher, who in predictive response may well be moved to join in the blame game and redirect the pointing finger squarely to the struggling learner.

Thus far, these discussions have centred on the infant-mother dyad. But the infant engages an internal self with an external world beyond and with mother. How then do we resolve dyadic interactions into and with triadic ones such that internal object-relations,

made of the world, within the learning self, entail particular affective meanings given and take of a responding world?

Typically educators conceive of teaching and learning in terms of triadic relations; that is, between student, teacher, and object of knowledge—the interplay enacted with/in situated socio-historico-cultural contexts and constitutive of curriculum. At the core of human pedagogy, and beginning in infancy, a shift is effectuated such that what was a dyadic relationship between caregiver and child becomes an “epistemic triangle” enfolding world (Carpendale & Lewis, 2006, pp. 236–237). Interestingly, the third comes to include all emerging conceptualisations, including those of self, other, and world.

The space of the third—the space where we live in Winnicott’s recounting, (1971/2005, pp. 140–148)—is the space of our joint world-taking, from given (and discoverable) into made (as “sensible”) and from sensibly made, back unto world as given (and thus discovered). But nothing is there for the discovering but through our own sufficient-enough agreement in what we make of it. The “realness” of the world “out there” arises from the virtually experienced into the real according to consensual-enough collusions of fit (and this is arguably the case, as much socially as neurologically; that is, if we can imagine our neurons colluding.) How that happens, how dyads morph into triads of sense-making, is subject of much recent research, potentially informative to teaching.

From Dyadic to Triadic Relations and a “Theory of Natural Pedagogy”

Initially child-world interactions appear to be dyadic and not yet referential: Child with other; child with object (Carpendale & Lewis, 2004, p. 84)—including to some

degree, I expect, the sensed partial and later “whole” self as “object” (e.g., the felt and then observed hand as it opens and closes). Without learned symbolic gesture, the child encounters the world in successive dyadic interactive instance, each marked in neurological change as learning. Over time, dissimilarities (against a background of embodied network of recognised assemblages) become notable and noticed.

Children “discover” that “different patterns of activity are possible with people as compared to with objects” (Carpendale & Lewis, 2004, p. 87). Given the experience of people not always responding in predictable ways and given the occasional refusal to comply with the child’s expectations or wants, “infants begin to regard people as independent ‘centers of causality’ (Piaget 1937/1971)” (p. 87). Perhaps, in this resides the infant’s early bias for attending to ostensive communicative cues: Quite simply, in terms of contingency detection, human behaviour is most intriguing. *The ostensive cue—by way of, for example, a raised eyebrow, a broadened gaze, wry smile, or an inflected voice—is that which invites attention as it playfully signals an ensuing pedagogical moment.* Such moments, in the more fluid of circumstances, come to be associated with a joy of learning; that is, the joy of autopoietic becoming, potentially felt at two levels: (a) at the level of the individual where physiologico–conceptual rewards are given of self-assemblage and of increased self-governance to act on behalf of one’s own security and (b) affectively-motivated assurances, staged in early attachment systems, that condition particular preferred patterns of participation in the collective assemblage of a safe-enough world.

Drawing from an innovative research programme in attachment that focuses on contingency detection within child-caregiver interaction, Csibra and Gergely describe a

theory of *natural human pedagogy* as the fundamental social learning system in humans (2011). They believe that this particular ability to teach and to learn from teaching is an adaptation that is “primary” and “independent” and, quite possibly, “phylogenetically an even earlier adaptation than either language or the ability to attribute mental states” (Fonagy, Gergely, & Target, 2007, p. 307).

Csibra’s and Gergely’s accounts of a natural pedagogy supplement and affirm accounts of the construction of mind given by Carpendale and Lewis (2006), who have fashioned a developmental conception of social and cognitive understanding out of something termed the “epistemic triangle” (Chapman, 1991; in Carpendale & Lewis, 2006, pp. 236–237). Drawing from Piaget, Vygotsky, and Wittgenstein, Chapman posits his epistemic triangle as consisting of subject, interlocutor (implied or present), object of knowledge, and their connective mutual relations (Carpendale & Lewis, 2006, p. 236). In Carpendale and Lewis’s developmental formulation, the triangle is used to describe the interactive triad of *attachment figure* as primary pedagogue–interlocutor who mediates between the *infant subject* and variously encountered *objects of knowledge* in world. These authors take the epistemic triangle to apply to the development of children’s knowledge about the physical world in concert with their social understanding (Carpendale & Lewis, 2006, pp. 236–237).

Notably, let me interject an important point to the relevance of this work. Though it bears ultimate relevance to the how of teaching it does not, indeed cannot, address the larger curriculum question of what is important to teach—an ethical, political, perhaps metaphysical question, that cannot follow from learning theory. At best, however, I could be approaching a point about an ethics of respect for a particular natural wisdom of

human becoming in singular plural being; that is, an understanding of sense-making, through play, located in transitional spaces, that has room for a growing, becoming well with world, child. I find it difficult to separate this how of teaching from the what in as much as the how of pedagogy also effectuates a particular kind of teaching about the exquisite valuing of humanity's and each human's possibility, however difficult to get to, of living well in a paradox of singularity and plurality.

The noted connection here—embodied from the beginning in the construction of self—between: (a) attachment systems, (b) affect-mirroring, (c) the social, and (d) cognition about things and the world—ought not be lost. The claim that I am making, and that arises out of these research frames, is that these elements of enculturation and socialisation of a biological self into and with world are of a piece. They are not separate realms that lend themselves to any productive teasing apart—a position I posit that ultimately stakes the, perhaps radical, claim that there are no affectively neutral spaces in education and that all we do, all we are, and all we know, as teachers and learners, cannot be divested from first orientations of a precarious bodily self, making sense of an acting self in, with, and through world.

In the humanities, it does not seem to me that this is new news. In the sciences, however, we seem interminably ensconced in the habit of pretending that understanding is a matter of some combination of intelligence, interest, and willpower usefully stripped of affective experiences that condition or have conditioned how we know ourselves in the world. It is an unhelpful Cartesian fiction (see Chapter 6 and Cartesian anxieties), leastwise unhelpful in the long term and big picture, that I believe we would do well to interrupt.

Returning to just how the epistemic triangle plays out in a natural pedagogy, begin with the caregiver–infant relationship—dyadic in our perception, but inaccessible as such to the neonate. Indeed, one might expect that, in first infant experiences, caregiver and world are encountered in a manner of undifferentiated (and to be explored) extensions of self—a self nested with and in boundless amniotic singular plurality. In any case, from our externally perceiving vantage, we might fairly speak of a dyadic interaction between child and caregiver wherein the caregiver increasingly assumes the role of interlocutor moderating “knowledge,” as objects of world, to the child. Significantly, these objects include not only “things” in the world, but collections and classes of things—and not only these, but other beings and collections (and classes) of beings, especially the being that is the child mediated to him or herself (Carpendale & Lewis, 2006, pp. 236–237).

Note also that this world, by default, would be initially taken up as constant and preexisting—a world of “thereness” into which the newborn is “thrown” and thus finds himself. There is no prior frame against which the child might conceive of change or time for that matter. Indeed, the child’s constitution is toward noting assemblages and ordering self and world in accordance with perceived encounters. Without some constancy, there is not opportunity to note difference. Understanding the world and the self in fluidity—in self-awareness of one’s own becoming, mutable and plastic, is a much later developmental achievement. For, without stability and coherence of an “is” there can be no perspective against which to realise “what can be” and to mark “what has been.” Within the very shifting trajectory of a perceiving self inheres the experience of time and the possibility of even thinking oneself as becoming. And so, the first task of becoming is

to “become oneself” into a felt experience of being—a path that cannot *but* be undertaken in the social and as it turns out, arising out of a natural human proclivity to pedagogical acts given and taken up.

This natural pedagogy that Csibra and Gergely defend as human-specific (2011), and that moves from dyadic relations to triadic, can be thought to take two forms: A primary form that introduces child to herself, upon and with a subsequent form that develops to introduce child to world. Both do so through bodily gesture, informed and moved by affect, to become embodied meaning inextricably linked in cognition as the thread of language weaves self with social, cultural, and political. Accordingly and imperceptibly, given interactions as being about something or someone, what is once dyadic becomes triadic and, with increasing abstraction, worldly.

Triadic Relations: Into Consciousness and the Languaging of Self, Others, and World

Attachment and affect-mirroring in detail.

To summarise thus far: Much of infant developmental literature of the past decade has focused on the character and quality of primary, adult–child, affect attunement with particular attention on the caregiver side to mentalisation (and to some degree mindfulness practices). Adult modes of self and other, understanding and relating, as are enacted in the caregiver–infant dyad, work to engender, in the developing child, degrees of security in attachment (emotions and feelings to do with relatedness and matters *interpersonal*) and in exploration (emotions and feelings to do with individuation and matters *intrapersonal*). In particular, the attuned-enough caregiver recognises and engages in affect-mirroring that is appropriately contingent, marked, and containing.

Moreover, affect-mirroring evolves with a pedagogy that facilitates the child's inclination to outwardly explore—at once prompting an enculturation into a languaged sense of that world. In short, the attuned caregiver as pedagogue teaches the child about herself and about the world by alerting the child to aspects of self and world and, at the same time, by affording names with which to language these attentions into accessible awareness.

Fonagy, Gergely, and Target review the literatures on the topic. In terms of attention to the self, they write, “Babies learn to differentiate the internal patterns of physiological and visceral stimulation that accompany different feelings through observing their caregivers’ facial or vocal mirroring responses to these” (2007, p. 309).

Imagine then an infant, with lamp-like consciousness, but lacking in any self-awareness or self-consciousness per se; that is, not having yet developed the physiology of mind able to, in any consistent manner, “speak” to itself (there having been but limited organising encounters with world). And yet, that same newborn's experience is indeed infused with and immersed in sensation, both interoceptive and exteroceptive.

The first step in self-awareness may well entail in the honing of proprioceptive organisation, wherein the child, through ever-refining sensory feedback learns to feel, localise, and coordinate his or her own limb movements in space—whether these be self-initiated or other-induced. Yet the neonate also expresses emotion and this is involuntary at first, as we have seen. How do the physiologically felt and outwardly expressed sensations of emotion, including the frustration and elation in attempted agentic acts (such as moving a limb intentionally in space) come to be introspectively known to the child in ways that parlay such emotions with more sophisticated and elaborated feelings about self and other?

While infants, during the first six months, are not “able to recognise a number of basic categorical emotions of others (see Gergely, 2002; Nelson, 1987) mothers will certainly react to these emotions if their child expresses them” (Fonagy, Gergely, & Target, 2007, p. 293). It is through just these responsive acts that the child has opportunity to learn about his or her own affective states. Researchers assume that this kind of “teaching and learning about minds and states of mind is mostly a mundane process within the attachment relationship, and that it is preconscious to both infant and parent—inaccessible to reflection or modification” (Fonagy, Gergely, & Target, 2007, p. 312).

“Good-enough parenting” is said to depend on the particular rhythm of “a caretaker’s contingent responses to [the] emerging subjectivity of the infant” (Leckman, 2007, p. 87). A process of synchronous affective communication entails the caregiver’s micro-level matching and moderating of the child’s affective states and levels of arousal.

Affect expressions by the parent that are not contingent on the infant’s affect will undermine the appropriate “labelling” of internal states (i.e., the establishment of introspectively accessible second-order representations for them), which may, in turn, remain confusing, experienced as unsymbolised and hard to regulate.

(Fonagy, Gergely, & Target, 2007, p. 309)

On the other hand, where primary attachment is sufficiently enabling, there exists a context of security around mother’s ability to “entrain the infant’s biological rhythms (Feldman, 2003; Lester, Hoffman, & Brazelton, 1985), providing a ‘resonance’ (Trevarthen, 1993) of internal and external experience, self and other, brain and behaviour” (Leckman et al., 2007, p. 105). In providing “external support for the infant’s

developing bioregulatory abilities” the attuned parent “convey[s] resilience to stress-coping capacities throughout life” (Leckman et al., p. 105).

Maternal gaze matching, facial expressions, vocalisations, and regulation of arousal states during face-to-face play provide critical environmental inputs during the sensitive period of maturation of the visual cortex [emerging around the second month of life]. (Leckman et al., p. 105)

The reciprocal nature of the relationship has also been explored with findings suggesting, “while maternal behaviours may act to promote infant development, infant cues (such as suckling, auditory, and visual stimuli) may also stimulate maternal care, even modifying pre-existing behaviour patterns (Rosenblatt, 1994; Stern, 1997b)” (Strathearn, 2007, p. 121).

Where stimuli are reduced (due to mother-infant separation, maternal depression, or substance abuse, for example) or dysregulated (e.g., in cases of extreme prematurity, illness, or birth defects), there may be an increased risk of disturbed attachment or maltreatment (Singer & Ryff, 1999; Weinfield, Sroufe, & Egeland, 2000). Differences in temperament as well as socioeconomic and environmental factors may also impact on the integrity of this mother-infant relationship.

(Strathearn, 2007, pp. 121–122)

In “Exploring the Neurobiology of Attachment,” Strathearn documents the dynamic relationship in mammals “between behaviour and neural development in offspring and mothers” (Slade, 2007, p. 132). He then offers empirical evidence, in human studies of functional neuroimaging, supporting the contention that child and adult attachment classifications reflect differences in underlying neuroendocrine brain systems

involved in affiliation and reward systems and that these differences, manifesting behaviorally and psychologically, emerge as a function of early caregiving experience.

Interpretable and interpreted meaning that evolves through and as consequence of increasing neurological organisation, is that which is afforded in interaction with first attachment figures and which gains nuance in and through language. Language itself is initially construed upon and in concert with the affective tones and world meanings primed by the caregiver in infant interaction—initially dyadic and subsequently coming to enfold elements of world (Carpendale & Lewis, 2004, 2006). Though dialogical, this process is conditioned by the caregiver’s tendencies and capacities in terms of affect-regulation—these a consequence to the caregiver’s historied presence in response to perceived infant behaviour.

Affect regulation at the earliest stages is carried out mainly by the attachment environment as the caregiver, reading the infant’s automatic behavioural emotion expressions, reacts to them with appropriate affect-modulating interactions and emotion displays (Gergely, 2002, 2004; Gergely & Watson, 1996). (Gergely, 2007, p. 58)

Degrees of wellness, as effective structural coupling of mind with experienced world—where that world literally consists without and within⁹¹—emerge through sensation and according to the tenor of this pedagogy of interactive caregiving in

⁹¹ The internal world, sensed interoceptively, registers signals in the somatosensory regions of the brain (especially the insula and to varying degrees, the cortical regions SII, SI, and the cingulate cortex (Damasio, 2003 p. 105). Interoceptive sensory signals transmitted neurally and humorally (e.g. blood stream) communicate conditions of the internal milieu, viscera, striated muscles, and the vestibular system (“reporting on” for example pain states, body temperature, osmolality, glucose levels, pH, visceral and genital sensations, itch, tickle, shudder, flush, presence of inflammatory agent) (p. 106–107). On the other hand, exteroceptive sensory signals are transmitted neurally and respond to mechanical contact (touch), chemical contact (smell, taste), and telesensing (vision, hearing) (pp. 106–107).

response to instinctual primary behavioral biases of the infant (Damasio, 2003; Gergely, 2007; Klin & Jones, 2007, pp. 10 & 12; Stern, D. B., 2003). The development of “a subjective sense and awareness of... primary affective self states” is primed when such “internal states [are] externally ‘mirrored’ or ‘reflected’ back through the infant-attuned contingent social reactions of the attachment environment” (Gergely, 2007, p. 60).

Thus, the character of the relationship with the primary attachment figure, especially the quality of affect-mirroring given by the adult, is crucial to denoting and validating the infant’s self-experience. Mirroring and naming promotes the reification of experience, in the terms of interpretation set by the perceiver (in this case the responding adult). In this way, the attachment figure legitimises and accedes access of that which is purportedly witnessed (be it a virtuous rendering or not) into the realm of a permissible, shareable, knowable real.

In selectively witnessing and responding to infant affective displays and agentic acts, the attachment figure interjects an emotional valence that opens and forecloses particular insights to the child, these reflexively informing future affective and agentic possibility. The meaning of the gesture gains salience and currency in the affectively-toned response of the other. An adult who is attuned, self with world, who sees the child well and aptly in terms with a world that can be rendered safe-enough, and who mirrors back that insight, sets the basis for self-confident exploration and participation in a predictable-enough, sensitive-enough world.

I have emphasised this entire last paragraph to call attention to just how easily one could substitute teacher as attachment figure and the points would be as salient for

pedagogical practice in schools. It is through such processes, at play for all humans, across varying contexts, that,

Attachment facilitates the appropriate organisation of the brain processes that come to subserve social cognition and helps prepare them to equip the individual for the collaborative and cooperative existence with others for which their brain was designed (Fonagy, 2003). (Fonagy, Gergely, & Target, 2007, p. 291)

Given what we know about autopoiesis and, in particular, about attachment systems, we might abbreviate our understanding with the following observation: The newborn mind appears to self-author in the interweave of three inborn inclinations: (a) away from fracture and toward reparative resolution—the primary instinctive drive to homeostasis in pain-avoidance and pleasure-seeking (Damasio, 2003); (b) toward assemblage and the adaptive synchronisation of internal physiological structures and processes, as habit, in response to regularities, and to subsequently contrasting disregularities of sensation, internal and external (de Weerth & van Geert, 2000; Damasio, 2003, pp. 38–39; Lewis, 2000; Scherer, 2000; Schore, 2000) and (c) according to the mirroring cues of a primary caregiver who directs infant attention and interest, affords affect valence, and overlays communicative gesture into language, thus shaping accessible experience, internal and external, and enabling and constraining the quality of agentic behaviour (Carpendale & Lewis, 2004; Fonagy, Gergely, & Target, 2007).

Importantly, where attachment is secure, the child as learner is more inclined to seek out and attend to pedagogical cues from the attachment figure and in so doing to actively engage objects of knowledge as are availed through explorative agentic acts.

The advantage of secure attachment for the precocious development of mentalisation and the stronger establishment of an agentic sense of self arises out of a *far more general predisposition for infants to be more ready to learn from adults with whom they have a secure bond* [emphasis added]. (Fonagy, Gergely, & Target, 2007, p. 313)

Thus Winnicott's insights some 40 years ago do bear out in presence research. To the degree that the dyadic attachment is experienced as secure, it supports triadic exploration and wholeness of play with cultural artifacts in a transitional space between a feeling self and a curious, alluring, intriguing world.

Exploration and the epistemic triangle.

Thus far, I have considered affect-mirroring as that particular pedagogical act to render the child back to him or herself. In such instances, the interaction is considered dyadic in as much as the subject and object of knowledge are one and the same: the child. Remembering Fonagy's statement that cognition can be thought "the residue of the actions of an organism upon the environment" (2007, p. 42)—where cognition, as conscious intention and awareness, is consequence of embodied knowing through acts that teach—then we can understand that the child participates in triadic relations long before awareness as such.

According to Carpendale and Lewis (2004), by the latter part of the first year, the infant is already embedded in triadic interaction between self, caregiver, and objects, but this does not imply that there is awareness in the infant of the triad—the differentiation of self, caregiver, and objects being gradual and irregular (pp. 84–85). Although triadic distinction seems apparent at nine to twelve months of age and may be "important in

further development of infants' social understanding... it is only very rudimentary and is more likely to be a manifestation of the attachment system than social understanding" (p. 86). For instance, twelve month old children are more likely to point in order to establish joint attention and enhance interaction; that is, either when a parent is looking at them (Carpendale & Lewis, 2004, p. 86) or to direct attention to an object over which they have no direct interest (Fonagy, Gergely, & Target, 2007, pp. 292–293).

In contrast, the fifteen month old no longer simply points, but also checks that the caregiver is looking (Carpendale & Lewis, 2004, p. 86). During the first half of the second year, the child demonstrates communicative intent in these kinds of more sophisticated acts of pointing, increasingly using "eye direction information as well as the head turn to achieve joint visual attention" (p. 86). By the end of the second year children point specifically to direct parental attention to something interesting that the parent has not seen (p. 86). Revealingly, experiences of coordinated attention—infant with adult—occur "before infants understand much about attention.... The infant becomes embedded in interaction with some success and only through the experience of that interaction later develops a more complete understanding" (Carpendale & Lewis, 2004, p. 86).

Noting that "it is almost axiomatic that the evolutionary underpinnings of human culture require that the infant turns to others for essential information about the world" Csibra and Gergely depict the caregiver as "biologically prepared to act in the role of... the pedagogue" (2011, p. 1105). In so saying, they describe the natural pedagogy as "a primary cognitive system with a collaborative design... evolved to facilitate" (p. 1105) the transmission of relevant cultural elements. In particular, this pedagogy predisposes children—and infants especially—to learn, from trusted adults, "the technological, social,

conventional and institutional knowledge and skills that are necessary for survival in their culture” (Csibra & Gergely, 2011, p. 1105).

The natural pedagogy proceeds as a sequencing of ostensive cues followed by referential signals: First the caregiver alerts the child to the ensuing pedagogical moment by enacting ostensive cues—eye contact and a gaze that in effect, says, “Get ready. Watch what I’m about to show you.” Then the caregiver directs the child’s attention to an object of knowledge or performs a single act of demonstration to be mimicked.

Defended as a human-specific communicative pattern meant to “efficiently convey knowledge with opaque content to others in a single act of demonstration” (Csibra & Gergely, 2011, p. 1105), the natural pedagogy is thought to succeed

not only because the recipient is prepared to recognise... [ensuing] actions as communicative demonstrations, but also because the addressee has the default expectation that the content of the demonstration represents shared cultural knowledge and is generalisable along some relevant dimension to other objects, other occasions or other individuals. (Csibra & Gergely, 2011, p. 1105)

In the first phase of the pedagogical moment, cues to which the infant is particularly sensitive—direct eye contact, facial gesture, infant-directed speech, and contingent reactivity on the part of the adult (see above)—alert the child “to identify and interpret others’ actions as communicative acts that are specifically addressed to them” (Csibra & Gergely, 2011, p. 1105). These researchers note various anticipatory biases in infants. For example, following ostensive cues infants

pay preferential attention to generalisable kind-relevant features of objects that are referentially identified..., learn causally opaque means actions from

communicative demonstrations...and assume that communicated valence information about objects (i.e. whether they are evaluated positively or negatively) is shared by others.... *These and other findings suggest that preverbal human infants are prepared to receive culturally relevant knowledge from benevolent adults who are, in turn, spontaneously inclined to provide it* [emphasis added]. (Csibra & Gergely, 2011, p. 1105)

Interestingly, at first, even when infants follow an adult's gaze, they do so without conscious expectation of communicative intent (Carpendale & Lewis, 2004, p. 86). They are merely engaging in mimicking behaviour. The expectation of something to be learned or seen is, in effect, learned in the doing. That is, ostensive cues are those early, learned behaviours to which an infant attends and that come to signal an impending learning moment.

Significantly, however, they also “engender attachment security through sensitive (contingent) responding. For the infant these signs mark not only the possibility of physical security but also the likely veracity of information communicated by that individual” (Fonagy, Gergely, & Target, 2007, p. 313). *Thus, the child coming from a secure attachment relationship has had opportunity to learn to trust a knowing adult not only for rendering a safe world, but also for communicating a knowable one.*

Shaping Autopoiesis as Sense-Making

In this manner, in interaction with a sufficiently-mirroring other, a self becomes the being into which that self acts and instantiates itself as qualitatively “experience-able” while externally named and defined by that other, where the other is pedagogue standing for world. *The degree of correspondence, then, between self and that self as named and*

understood in world, turns on the quality of the attunement and the knowing of that first pedagogue however that “quality” and “knowing” come to be culturally, historically, politically, and ultimately intersubjectively defined. If affective states are not rendered accessible in mirroring, the child is bereft of the opportunity to attend to and learn well⁹² its own interiority in terms of that world. In the absence of attunement of some sort, the affective self would tend more to a primitive unformulated state, and this is the case even as that affective self continues to dictate to and govern self-understanding and commensurate agentive action in the world.

Mirroring that fails to give back an adequate and acceptable self compromises, if not sabotaging altogether, the infant from coming to know its own biological rudder, and to have means to begin to understand the other. *The child must look outward for cues of self and other.* A child thus conditioned to an inadequate mirror would be hard-pressed to struggle to maintain the mirrored façade of that which the world has taught as the game of being. At the extreme, it would install a guessing game fraught with uncertainty leaving but two oscillating exhausting solutions of distrustful modes of being: (a) either hypervigilant monitoring of external cues, or (b) the shutting out of that external world (Fonagy & Target, 1996b). Both express conditions of a minimalist existence (Lasch, 1984) in the most profound sense.

⁹² Admittedly, wellness is arbitrated, problematically so, depending on the world; that is, in terms of “fit” with the conditions given of the world. Thus, though one could parent a child well, that is into security, to say this is not to speak to what bearing such acts have on the larger historical, social, cultural, ethical curriculum that is taught. I can imagine a particular kind of traumatic, difficult to resolve ambiguity, that might arise if a child raised in kindness and love but the cultural dictates learned are of those of oppression. I expect this would instate a different kind of insidious pathology “solved” by declaring those oppressed as non-human. On the other hand, there do exist children parented under the most horrific of conditions that do find their way to another side of grace in the world. The formulations I offer in this chapter, are always, always subject to the uncanny surprise of something different. They are not given as absolutes but as occurrences to muse over and think with and through

Inadequacies of early attunement fall short in rendering safe-enough self-*with*-world conditions. Instead to varying degrees, the failure of pedagogical provocations to attend to the child, to teach of child and world—either because of non-contingency as inordinate dismissiveness or preoccupation—gives back anxiety and not playfulness. In jeopardy is the shutting down of curiosity in a self that remains foreign to the self. Such conditions of “crazy-making” render perilous the infant’s ability to anchor any agency in the world to a knowable-enough sense of self.

In caregiver-mediated encounters with world, whichever way such encounters do come to lean, reside means and motivation for self-*with*-world negotiations of constitutive boundaries, fittingly permeable and plastic according to adaptive first lessons. In a self’s explorative or inhibited doing, that self experiences the play of its own self-defining possibility. Accordingly, a self finds agentive ways to enact itself into becoming the self it comes to know. Such acts of learning are, at once, world- and self-making.

The sense of mind is construed both literally and figuratively. And yet for the resultant sense that is made, to make sense, it must be perceivably strapped to a world taken as others perceive it to be given.⁹³ Where such coupling is inconsistent with conclusions agreed upon by other perceivers in the same world, we as these others impose our conclusion that “proper” sense has not made, and this will be the case regardless that the perceiver’s experience says otherwise. Thus pressed to live in such ambiguity, assuming it is experiential not resolvable, the perceiver either can deny the

⁹³ Again, there is always the troubling problem (not the subject of this dissertation) of the arbitration of sense as something deemed admissible, acceptable, in terms of suitable fit of self with given world. What “makes sense” may or may not be culturally, socially, historically, or ethically admitting or accepting.

other's professed perception or ignore his own self-experience. That is, in the face of an inability to see it their way, said perceiver either insists on his difference—and risks being called, at best, wrong/misguided, at worst, mad—or he can keep those inadmissible perceptions to himself, even dissociating against their formulation.

What happens to an infant for whom the experience of self is irresolvable to the mirrored experience he or she takes of primary and subsequent attachment figures? Crucial to development, sense-making begins with the sense made by the body in intimate connection with affective/neurochemical signatures of degrees of vitality as wellness experienced. That is, sense is made according to increasingly refined dictates to and from a neurochemical value system that bathes the self in affect-inducing hormones. Potentially awash in these conditioning physiological parameters of degrees of wellness—viable-being-as-pleasure and unviable-being-as-pain—the self learns itself in experience as if traversing an emerging, increasingly-refined labyrinth of possibility according to the rudimentary dictates of pleasure-seeking and harm-avoidance. Anxiety consists in bodily anticipations of past experiences of failings in wellness (Panksepp, 1998, p. 220–221).

To summarise, the trajectory of mind in world is toward creative autopoiesis and agentive vitality in accordance with physiological constraints of viably felt being. Yet protracted human development means that beginnings, if they are to be viable at all, are beginnings rendered into security by good-enough caretaking others—the most proximal of which will act as attachment figures and first pedagogues mediating and moderating the realms of intelligibility and possibility for the child-initiate to itself and world.

Moreover, and centrally, what clues might we glean from a deeper understanding of the nature of human being and becoming that could subsequently inform how we, as a culture, in global citizenry, might mindfully take up an educative challenge to interrupt rather than reinforce transgenerational lineages of unwell being—of worldly traumas visited downward and sedimented into minimally-lived selves whose very ability to trust appropriately and to risk in adaptive self-change carries the compromised scars and injuries of a larger system? What would education look like if, rather than demanding performances according to externally pre-scribed givens, we instead strove for mindful teacherly presences that gave audience in theatres for self-world sense-making—collaboratively so? And, what differences might unfold out of efforts in attuned mirroring not just of learning selves but of bodies of knowledge where the spaces in the cultural scripts become their possibility for movement and play—mutually engaged transitional objects for becoming with world, self, and other? If these things constituted our intentions, how then would we construe our schools, teach our teachers, and shape a curriculum for singular–plural–being?

I posit these questions not because I think for a moment to have enacted some right way in my encounters with Matt. Rather, the point is that these questions were at play and our noticing them here presses a work of bringing minds together attending differently to what before may have gone unnoticed. It is through the lens of these questions and others they spawn, that we might interrogate my work with Matt asking, “What happened there?” and “What can we helpfully make of the happening that occurred?”

5.5 In the Spaces (3): Illusions and Disillusionment

A Tight Coherence: Histories in Schooling

June 21, 2009.

Matt: I really didn't learn anything in grade 7 or 6.

Lissa: Period? Really? Talk to me about that.

Matt: I don't remember nothing from elementary school. Grade 4 from here. I came half of grade 4.

Lissa: So, K, to the middle of grade 4 was Montessori. And then you moved here in the middle of grade 4?

Matt: And yeah then I really didn't learn anything. I learned back most of what I missed. But. It's not that hard. Like grade 8 and 9. They were hard, but not so hard now.

Lissa: What made them be hard and then not so hard?

Matt: I had two horrible teachers for grade 8 and 9. And then I took it online and then it was easier.

Lissa: But you said 7 and 6 you didn't learn much.

Matt: Yeah. It's not that I had a bad teacher, but I just didn't learn that much. Like none of it stuck.

Lissa: Can you give me a sense of how the teaching worked that you remember?

Matt: From 6 and 7 when anybody learned anything. Just like showed you how to do it but without any understanding. And then in grade 8 and 9 my teachers were just bad at teaching. They didn't show good examples of how to do things that really

made sense. And that may have been because I didn't really know how to do the elementary school math. But it's not that big of a deal now.

Lissa: What about other people in your class?

Matt: There's like in Grade 9 this year, either you're doing really good or failing horribly. So it was either you understood or you didn't.

Lissa: And did the teacher treat it that way? You're either good at math or you're not.

Matt: Yeah. Pretty much. Exactly.

Lissa: Did you sense that in grade 6? Is that something you've always sensed along the way?

Matt: No. In grade 7 or 6 my teachers were willing to help but just some things made sense and others didn't. Hard to think of examples. There was only sometimes that things that were taught made sense.

Lissa: So if you could give advice to teachers in grade 6, 7, 8, or 9. What would your advice be? How would you suggest they approach it?

Matt: Give more examples. Ways to do things.

January 11, 2010.

Lissa: Think about your teacher this year.

Matt: She's nice, I just don't like her teaching.

Matt: She doesn't really lecture. Well I guess she does but it's always about math. I don't really understand it. She's just talking something, it's just some way to do something. It's weird. A whole bunch of math. Lots of arithmetic I can't really do very fast. I can't really keep up.

Lissa: Sounds like how I felt in Ecuador trying to follow a conversation in Spanish. I just couldn't keep focused 'cause I kept losing the thread.

Matt: It's kinda what it's like. 'Cause sometimes I'll understand an equation er-r like know the answer to a question that she asks or like the negative or positive, um, not as a whole I don't understand it.

Lissa: M-hm.

Matt: When she starts talking and saying something that I'm not familiar with and she's kinda fast and then she's half way through the question, I don't really know what's going on.

Lissa: So at points like that, what do you do?

Matt: When we get time to work, I usually try to work it out on my own. Most of the times it would work out if I just ask somebody beside me. It's often more help than asking the teacher.

Lissa: Mm-hmm. Cause they'll tell you what to do?

Matt: Yeah.

Lissa: Usually the what to do is pretty straight forward cause it's do that over and over again.

Matt: Yeah. The person sitting behind or beside me, cause they're thinking about it in a simplified way.

Ownership Stories: Giving Critical Audience

August 6, 2010.

Lissa: So how'd you do on that homework?

Matt: I think there's just a couple of questions that I really needed help on.

Lissa: *OK. Did you power through the one's that were tough.*

Matt: *Yeah, I didn't do just 3 of them.*

Lissa: *Remember call me when you get stuck [He never does, in 2 years, even though I keep offering. The offer is never declined, and never taken up. Am I nagging?]*

Matt: *Oh yeah. I think I understand. Oh I forgot to mark the rest of them but I marked these ones.*

Lissa: *Is that your test? What is that? Oh a student learning plan. Interesting. I didn't know the district sent these out. That's handy. So I see here it asks the approximate date you intend to complete this. Oh that's the game plan.*

Matt: *Hmm.*

Lissa: *I would like you to put some dates on here as a tentative outline, OK? And in light of that, find out when you have to do the final test. Did you ask your mom?*

Matt: *No, but she knows I think.*

Lissa: *But I want you to tell me, because I don't know.*

Matt: *OK.*

Lissa: *Did you happen to find out how you did on your Module One test?*

Matt: *Oh um. [He takes out his cell phone.] I'll call my mom.*

Lissa: *Well, you don't need to.*

Matt: *But I won't remember.*

Lissa: *Well, I'm writing it here.*

Matt: *All right, I'll probably remember then.*

Lissa: *So, bring your Module One test and plan dates next time. I'd like to see how you did and what you think, OK?*

August 13, 2010.

Lissa: So speaking of managing, I forgot to ask you last day if you had done that schedule.

Matt: Oh this? I was wondering what that was.

Lissa: Timeline. Plan the dates. Do you want to do that right now then?

Matt: Wait, the days of what?

Lissa: Of when you'll get things done.

Matt: Oh, completed?

Lissa: Yeah. But in order to do that you need to know the end point. When is the final exam?

Matt: In like 2 months or something?

Lissa: You don't know exactly? So that's what I want you to find out. [I write it down.] What I am paying attention to when I ask you to do this is, I feel like, and I'm guilty of this, I, too much, take over. And what that does is, it lets you be able to sit back and let other people manage it. And I'd like you to take ownership of it so that we can sit back and say, how can we help you with your goals.

Matt: Yeah.

Lissa: So can you find that out and then do what you can looking at how frequently we meet, how frequently you want to meet come the school year, and pencil in some dates—

Matt: OK

Lissa: —with a calendar in front of you. So that's priority number one because I think part of your success is going to be out of taking ownership. OK?

Disillusioning Moments

An email exchange.

Lissa: (Sept. 21, 2010) Hi Sonia, I am writing to let you know of a growing concern and to explore best ways to address it early.... In any case, we'll be continually running into these kinds of moments unless the intensity of his approach to the work changes.

Sonia: (Sept. 21, 2010) Overwhelming and disappointing, a more substantive response later.

Sonia: (Sept. 25, 2010) I always hope that Matt is going to get on track and then step along at the same pace as others. But that may not and need not happen with math. I want him to complete Gr 10 math in a timely fashion but I think it is important for him to learn the math too, not just get ready for the test.... I trust your diagnosis [emphasis added] of his current knowledge and your judgement about what he needs to do to develop a real understanding.

Lissa: (Sept. 25, 2010) I appreciate what it feels like to 'keep hoping' Too I appreciate your trust in me and your willingness to reconsider as the scenery shifts.

I wanted you to know, while I also share your hopes... perhaps more than hoping, I now believe that he can [get on track]. A year ago, I wouldn't have said that. Too much was unknown. Now, the difficulties and obstacles have changed. Before, he lacked prerequisite understandings and automaticities from elementary work. Those are now sufficiently in place. I am not so certain,

however, about the degree of practice and the kinds of engagements needed to help him hold those new understandings in place and to apply them forward. I do remember from my teaching of grade 10 math that rare was the student who could do well without completing a fair amount of homework. For most, that meant 30 to 40 minutes a day on average. For others it was much more. I can't get a good reading from Matt on the kind of effort he is putting in away from me. When I ask how long such and such an exercise took, I tend to be surprised at how short a time he names—though he may just not be aware of the time. I really don't know if he is putting in the hours that I would expect from a grade 10 student. I say this in terms of the possibility of "stepping along at the same pace as others".

In short, I currently am not yet convinced that he can't keep up. I suspect he can, though he may not be ready to--that is, in terms of what's important for him right now.

I will set a workable pace so that he completes grade 10 within the year.

February sounds right to me too.

One more thing: It feels somewhat off-kilter for me to send missives reporting homework completed or not. It feels like a kind of surveillance that is counterproductive in the larger sense of Matt's own agency. Can we simply say, as a standing 'order' that the homework I suggest (& write down) ought to be completed, checked, and so forth? And that if it is not done on a fairly regular basis, well, you can always see that for yourself. At which point, you can fairly assume that he's not progressing as well as he might need to be to ensure

success. I am not one to assign work for the sake of work. By the same token, if it does seem like too much, do let me know—that information is useful for me and I will adjust.

Lissa: (Sept. 27, 2010) This morning was HUGELY productive. It is truly amazing what Matt can do when he sets his mind to it. Whatever you did/said made a gigantic difference. I dare say you sure do know how to bring out the best... of a terrific 'kid.'

April 12, 2011.

Matt: The Spanish teacher just keeps throwing out projects and tests. I'm failing at Spanish.

Lissa: Oh. You said something about phys. ed.

Matt: Yeah I had to drop that 'cause my teacher hates me. Wouldn't leave me alone.

Lissa: What are you doing to get people to hate you? 'Cause you're such a nice guy. Really! Do you have an external something, so that they don't get to see the you underneath, or what's it about?

Matt: I don't know.

Lissa: So really? In gym? 'Cause one would expect you'd be good in gym.

Matt: Yeah.

Lissa: Hm. That sucks. So did he change from last year or what?

Matt: I don't know what his deal is. He's a really mean guy. No one really likes him. He's a racist.

Lissa: What makes you say that?

Matt: He always gives the good grades to Chinese kids.

Lissa: So what time are we working till?

Matt: Three o'clock.

Lissa: So just 15 minutes?

Matt: Yeah. This is stupid. [Under his breath.]

[We work 25 minutes longer and his spirits rise as he engages the material.]

Matt: You know it's kinda relaxing doing this. It takes your mind off other things.

This foreshadows mom's later observation "Ironically, mathematics has become his least stressful subject." and contrasts with Matt's explanation several months earlier as to why he had skipped particular homework questions, "That would be like trying to pick a fight with a bully." And yet...

April 14, 2011.

Lissa: K. You can't. See right here, we're skipping these. You actually have to do them all. Seriously I was a good student and it came to me quickly, but I would spend two hours a night. At some point you have to start doing this. And that point is really converging on you. Unless something shifts, I actually, I, I've stopped believing that you're going to be done by August. It's not that it's not possible, well the possibility of it has to do with who you are, and who you decide to be.

Matt: Ok. [subdued...he's really listening]

Lissa: So, I don't know. It's a measure of how important it is to you, but it's also a measure of how able you are to change yourself. You know, because you have certain habits of being that have inertia in them, in you. And you'll need to shift them, but that's hard to do. And so, you have to have a desire equal to that inertia, to offset it, kinda like gravity. And I don't know if you have enough

desire or I don't know how much inertia you've got. Something's stopping you from doing what you need to do. And it's up to you. And you know, I mean, I guess it wouldn't be the end of the world, you could start when you're in grade 12 to do grade 11 math in a regular class.

Matt: I don't want to do that.

Lissa: Um. But then that's going to stop a whole bunch of other things. Isn't it?

Matt: M-hm.

Lissa: Cause you registered in some courses that you need this for. Or am I missing on that?

Matt: Um. Not necessarily need, but want.

Lissa: OK. Yeah, well if you took grade 11 math while you were taking chemistry, um, that'd actually be ok. The only thing is then you're going to be looking at playing catch up.

Matt: Yeah.

Lissa: So after grade 12 then you would need to do an upgrade year.

Matt: Yeah.

Lissa: So, I mean, it's not the end of the world. Those are the choices you face. It's like you bear down, or you don't. I'm actually more concerned about you becoming the person you want to be. You know what I mean?

Matt: Yeah. I know what you mean.

Lissa: Yeah. It's just like the step ahead of you. It's like, yeah, I'm going to do this.

Matt: Nothing is getting easier. Especially with my mom. [She sprained her ankle.]

Lissa: How do you mean?

Matt: I have to do a lot more stuff. Basically everything that she used to do.

Lissa: Like what?

Matt: Around the house, like doing laundry, doing dishes, taking out the trash. It doesn't sound like much, but it adds up. Um. My mom used to do a lot for me. My dad doesn't do anything for me, so. Well he doesn't not do anything for me, but, yeah.

Lissa: That sounds like a yucky place to be.

Matt: M-hmm. Sigh.

Lissa: Um. What's your take on that.

Matt: What do you mean?

Lissa: I'm trying to think how I would feel under what you're describing.

Matt: I just feel really pressured.

Lissa: M-hm.

Matt: Um. I don't really work well under pressure at all. There's a lot of things. I really do want to finish this year.

Lissa: How can I help you?

Matt: Um. I don't really think there's much more I could ask of you. Not really.

Lissa: Ah. Sigh. It's hard to dig in. Like when I was in a head space emotionally where things were in an upheaval, I couldn't concentrate and find joy in my work, because there were other things filling my mind. I don't know how I did it when I was a kid, 'cause I was able to concentrate and I had mega stuff happening in my life. So. I have no idea. Maybe I was dysfunctional in a good way?
[Laughter.] That's the only thing I can figure out. Yeah. I think school was an

escape for me. So. Um. If someone told me who I was and tried to tell me what I would be, it was like putting up a red flag. I'd be like, are you kidding me? And it just made me dig in more.... The point is I just kinda bracketed myself off and said, nobody gets to decide my life, this is what's important to me. I took ownership. The part I disliked most was when I was told to do something that I was going to do anyway. It made me have to fight my desire to rebel. Like when I was told you have to study for this and you have to do that, all of me in me wanted to not study, because I felt like, no, you don't get to tell me what to do. So then I would go, no, if she wasn't there, what would I do? What do I want to do for me? Never mind what anybody else says.

Matt: M-hm.

Lissa: And I held on to that. I don't know if that's something you can do. Um. I don't know, does that help at all?

Matt: Yeah. It does.

Lissa: It's like, hold on to who you are and think about what you want, and what you value and then go through whatever it is you need to do and don't be really hard on yourself. If you don't get through it. Well you don't. But can you cheer for yourself when you get stuff. Like when I get through something, that was hard, I'm like oh, good, I did it, I feel good, and I didn't think I could. That kind of a thing. Instead of setting a goal that's so far away and then just sort of being pissed off at yourself, your own consciousness says, crap, I'm getting here and I only did those two questions, and you know and what's other people going to think? Instead of what do I want for me? Right?

For me, that's what's important, for you. It's not that you do however many questions that you do. It's that you do something that meets your approval, of your self. Cause, I'm not judging you. I'm just like saying, here, if this is your goal, this is what you need to get there. But it's cause it's your goal, it's not my goal.

Matt: Yeah.

Lissa: And it's perfectly fine if you don't finish. But decide what's going to give you that sort of strength, of I feel good about myself and that makes me want to work harder, not less. Instead of I didn't reach, you know, like I did all these resolutions last night, tomorrow's going to be a better day and then, crap, you know, had some friends, wanted to do this, wanted to do that, and now look it's already 11 o'clock and I didn't do what I intended to do. And, I don't know if you go through that. Do you go through that? Cause I go through that.

Matt: I do.

Lissa: and you end up berating yourself in your head space. And that does nothing for your sort of self-confidence and yeah. Take a small enough thing that you know you will do.

Matt: Yeah.

Lissa: And don't say I'm going to get all this done. If you're not, you're not.

Lissa: So what's holding you back? and I think by now you know it's not your ability.

It's—

Matt: —my will.

Lissa: It's—

Matt: —motivation.

Lissa: I think it's habit. I don't think you lack for desire. I think it's habit. It's like trying to break a habit of TV, or trying to break a habit of anything. It's part of, it's in your body. It's a change and the more you go through that kind of self-chastising the less willpower you have because you don't believe in yourself. I don't know how to describe that but—

Matt: I'm really bad at breaking habits, really bad.

Lissa: What makes you say that? Do you have examples?

Matt: Procrastination. Like certain things like a lot of classes sometimes I'll get into habits of just doing something in that class that's not productive at all, just sitting there the whole time and saying, whatever, it's this class, it's just. You have to do this or do that and it's just hard to, when things come around that I actually have to do, to you know, get through the course, it's really hard to just get that done.

Lissa: M-hm. And it feels like, as it gets closer to crunch time, then the pressure is big enough to actually get you moving

Matt: Yeah.

Lissa: And that's part of a habit too, that's kind of your mode and that works in younger grades but

Matt: Like for example today in Spanish class we had a project due and I missed a test last class because I had to stay home and I totally forgot about the project because I was busy studying for the bio test that I had today and so other people were doing stuff and the teacher was not really there so I just went to the library

and did my whole project during that class, that it was due [chuckle, but not of humour].

Lissa: Hmm...

Matt: Yeah.

Lissa: And then, I'm going to toss this out, and I want you to tell me what you think of it. I get this feeling and I think you would come by it honestly... of condescension toward the school system.

Matt: Like, dislike?

Lissa: Like a looking down upon teachers, the way the schools are run, the way the classrooms are. It's like aw that sucks and you know it ought to be better and da-da-da da-da. It's kinda not a gracious saying, "You know these are human beings. They're trying their best. They do some good things." It's like a—it's one way of taking the heat off yourself.

Matt: Yeah. It's true.

Lissa: I don't know how a person gets past that. Hmm... I think you should just love the world [said humorously].

Matt: [Amused too.] Sigh.

Lissa: Understand that everyone struggles. The things you're feeling? Everybody feels, to some degree or other and we have different ways of coping with it.

Matt: For sure.

Lissa: It's hard because you come from parents that are both successful.

Matt: Ya.

Lissa: And so that definitely adds pressure as well. You have this expectation of yourself, kind of an identity.

Matt: Ya.

Lissa: And so you have to kind of maintain that.

Matt: It sucks when my friends know what my parents do and they're always asking me why I don't do as good as other kids in school.

Lissa: Yeah. Maybe you should just try refusing. Maybe you should just not do any math. Rebel.

Matt: [Laughs.]

6 Rooting and Uprooting Anxieties: Cartesian and Narcissistic

It was nearly 30 years ago that Bernstein coined the expression “Cartesian Anxiety” (1983, p. 16). Overcoming it according to Bernstein meant “learning to live without the idea of the ‘infinite intellect,’ finality, and absolute knowledge” (p. 166). Citing Rorty, Bernstein optimistically wrote, “We are coming to the end—the playing out—of... [what] Rorty calls... the “Cartesian–Lockean–Kantian tradition” (p. 7). The anxiety borne of that tradition, prevalent in and conditioning the

agon between objectivists and relativists has been with us [though, of course, not always named Cartesian] ever since the origins of Western philosophy or at least from the time of Plato’s attack on the sophists and on Protagoras’s alleged relativism. (Bernstein, p. 8)

Are we coming to an end of that particular “intellectual tradition,” as Rorty, in Bernstein, professed? “Hardly” seems the quick answer. Yet, maybe, just maybe the opening for this dissertation’s emergence as possibility in the academic world of education signals that we are somewhere in the beginning of such “an end.” I am not too old to forgo the romantic’s vision: One can hope—and, yes, I do.

In this chapter, I begin the work of framing mathematics anxiety, as expression of existential anxieties at the interplay of those narcissistic and Cartesian. For, though taking “religious, metaphysical, epistemological, and moral” forms, ultimately Cartesian Anxiety is an ontological one residing at the centre of a question of being (Bernstein, p. 19) and Narcissus’s dilemma is every human’s ontological, existential challenge.

In my reckoning, these families of anxiety (mathematics, Narcissistic, and Cartesian) are raised, and reiteratively upheld, in the performative work of what I’m

inclined to name as *experiences of futility*—these calling us into particular anxious and minimalist being while foreclosing more agentic possibilities of self. I locate four such experiences of futility: (a) the promise, resurrected and yet always floundering, of absolute, discoverable, right certainty—especially promulgated in schools, and, within schools, especially avowed in those disciplines, scientific and mathematical, believed to be most rigorously constructed according to dependably unbiased Method—this, though method was never innocent nor neutral (Bernstein, p. 45); (b) the inevitable embodiment (and deeply-scripted limbic presence—as historicized into a presenting-yet-prediscursive self) of a first shattering: the loss of that primal infant illusion—even as (or perhaps before) its bodily experience was becoming cognitively knowable—of self-continuity with an omniscient, omnipotent, world–mediating, and world–affirming other⁹⁴, (c) the vulnerability installed and iteratively reinstalled, in escalating, largely nonconscious and unconscious (Lachmann, 2008) reverberations of these losses, each entangled with and upon the other; and (d) the uneven striving to regain sufficient security and trust, in the ready-but-humbler circumstances of fit and adaptability amid less-than-constant experiences of being, becoming, and knowing self as always already with/in world.

⁹⁴ Winnicott writes of a primary infant illusion of omnipotence as “nearly a fact of experience” (1971/2005, p. 15). At the start, assuming all goes as we would hope, if the child wants for milk, she cries her distress and the world provides. This conditions the experience of an illusion of omnipotence and continuity between child and mother: that wishing something makes it so. The mother’s eventual task will be to assert herself as other and thus “to disillusion the infant... [though] she has no hope of success unless at first she has been able to give sufficient opportunity for illusion” (p. 15). Disillusioning moments are affectively poignant and their memory will be scripted into primal limbic regions of the brain. Before we could even think about the world through language, we would have experienced and memoried the intangible, unformulated and so untamable, experience, of that first loss. Yet, in losing omnipotence we also lose a frightening phantasy that that which we think and desire (in anger as in pleasure) will indeed come to pass. In loss of omnipotence and omniscience, a world (for which one is no longer so responsible) is gained for the exploring.

These anxieties do indeed seem as pervasive, if not more so, today as in the heyday of the Modern Era, highlighted in a 50s existential rise, and cause for concern across numerous writings in the past several decades around trust and minimal selfhood for example (see e.g., Lasch 1984; Möllering, 2005; Twenge & Campbell, 2009). Most notably—for present purposes and characteristic of a troubling 20th century, modern framing of public schooling—I believe a frenzied tacit dance around such anxiety continues to characterise the educational ethos of these not-so-post times.⁹⁵

In *Beyond Objectivism and Relativism*, Bernstein (1983) developed his thesis that the opposition between objectivism and relativism (these terms broadly taken) was—and I contend continues to be—“the central cultural opposition of our time” (p. 7) and that of objectivism and relativism, “either position is intelligible... only [as much as] we implicitly accept some version of Cartesianism” (p. 19).

Notably, the very advances in understanding of infant and childhood development, articulated in the previous two chapters, and relevant to a view informing curricular conversations and enactions as begun in Chapter 7, arise out of a decidedly non-Cartesian worldview of radical embodiment. Embodiment and enactivism displace a limited and limiting Cartesian approach to the emerging self—that anachronistic approach both presupposing “direct introspective access to subjective intentional and emotional mind states, and... impl[ying] the existence of prewired, universal and subjectively equally accessible intentional and emotional self states in all human

⁹⁵ This anxiety, in my view, is largely what underpins attempts to measure and manage nearly all aspects of schooling and achievement in schools (Grumet 2010) as expressed in the intention that no child shall be left behind or to take a more recent local example, that no child should earn a zero score, regardless of assignment completion or not (Edmonton Public Schools, 2012). Schools seem bent on delivering certainty of knowledge and achievement as deliverables, and yet any illusive foundational certainty has been soundly disillusioned, to say the least!

individuals” (Fonagy, Gergely, & Target, 2007, p. 291). Indeed, the Cartesian intersubjectivist view with its innatist position left little room for a personal humility in terms of what we might know of ourselves and others as teachers and learners and it discounted any notions of autopoiesis in the ongoing developmental and refinement of a subjective sense of self in adaptive awareness and response to social environmental factors. The still popular tendency to label and brand children and teachers as characterised by this or that type of intelligence, learning preference, or teaching style, for example, arguably arises out of the ensconced poor-minded Cartesian belief that

[variations] in the range and kinds of internal mental and emotional states, in their relative degree of subjective accessibility, or in the ability to use them to simulate the contents of other minds,... [are best] explained as a result of genetic differences, maturational dysfunctions or brain injury. (Fonagy, Gergely, & Target, 2007, p. 291)

My present curiosity then is to address, What keeps us here, inhabiting “some version of Cartesianism?” I suspect the answer lies partly in cultural habit, the resiliency and inertia of culturally replicating habits, and partly in the human paradoxes conditioning the construction of psycho-social selves. Perhaps more than any other species, our existence, our dilemmas of being, and our awareness therein, consist in a position that straddles part and whole, across multiple levels of complexity: That is, our wellness entails as much in our individuality (ourselves as cell collectives) as in our communal collectivity, these pressing consciousness and modes of interaction in two places at once: singular as plural collectivity, and singular as part of larger pluralities.

Indeed, Winnicott suggested as much over 40 years ago:

I do believe that there is such a thing as psychiatric health, and this means that I feel justified in studying society (as others have done) in terms of its being the statement in collective terms of individual growth towards personal fulfilment.

The axiom is that since there is no society except as a structure brought about and maintained and constantly reconstructed by individuals, there is no personal fulfilment without society, and no society apart from the collective growth processes of the individuals that compose it. (1971/2005, p. 190)

Perhaps, a beginning solution to individual and collective anxiety might be sought, or at least a fecund direction cast, by considering how we might learn our way *through* anxiety, neither striving to avoid it or displace it, but rather by loving it.

In the approach of loving mathematics anxiety we “use anxiety itself to rebuild the subjects’ relation to the Other’s desire, to help them in finding their way towards their always receding and never reachable object of desire” (Baldino & Cabral, 2008, p. 74).

Anxiety, loved paradoxically into its own waning might create openings for curiosity to play more freely in mathematics such that the players approach it, brush up against it, and altogether flirt with it as an encountered instance of mythically-enticing and fleeting object of desire.

Cartesian Anxiety

Bernstein writes that he formulated the construct of Cartesian Anxiety to better grapple with a particular set of problems, metaphors, and questions arising out of a pervasive ascription to Cartesian foundationalism (pp. 16–17)—that false assurance uttered to a vulnerable psyche in want of stable anchor. The anxiety is that which ensues

at the threat of shaky foundations—those foundations unable to withstand the assault of a disillusioning world. This is the anxious response to those irresolvable moments of uncertainty that accrue and elide together until one is left mired in a bog of abject relativism. Moreover, these anxieties seem to entangle with unavoidable, and barely tolerable (if at all), conditions of nebulosity when it comes to the possibility of security and appropriate trust—enough—in self, other, and world. It seems these struggles, emanating out of the psyche and installed in first becoming, ultimately find public expression in the contentiousness of understandings around, for instance, what Bernstein describes as “the foundations of knowledge and the sciences, mind–body dualism, our knowledge of the ‘external’ world, how the mind ‘represents’ this world, [and] the nature of consciousness, thinking, and will” (1983, p. 17).

Of Descartes’ *Meditations*, Bernstein writes:

With a chilling clarity Descartes leads us with an apparent and ineluctable necessity to a grand and seductive Either/Or. *Either* there is some support for our being, a fixed foundation for our knowledge, *or* we cannot escape the forces of darkness that envelop us with madness, with intellectual and moral chaos. (1983, p. 18)

For a time, Cartesianism, if thought the pillar of the Age of Reason and Enlightenment, seemed to be effectively getting at *something* thought to be truth—testable refutable truth—that is, if truth meant the affordance of predictive explanatory models, technological prowess, and empirical domination. We have “enjoyed” a lengthy and heady run of Western illusions of success in terms of omnipotence and omniscience. Science has proven a powerful tool in augmenting human sense-making of the natural

world, where the sense made entails in a coherence of stories told—both internal within-story coherence and coherence as seeming-fit with a world happily obliging our fitness tests of formulated hypotheses. Science has been that episteme founded in a technique that returns questions to refined, standardised, and measureable senses. But these are inevitably tools of our construing, corralled according to our oh-so-human hermeneutic biases that cannot but condition what we can choose to perceive and what we think to ask. The Cartesian expectation fueled a positivistic science, admonishing that the path to a spirit realm's absolute rightness and precious foundational knowledge was through self-denial in the enlistment of reason freed from irrational bodily limitations—the latter being purview of the humanities. Ultimately this would break down. Though the critique of Cartesian thinking has been soundly effectuated in theory, not so in lived experience where the implications of embodied cognition as post-Cartesian non-dualism have not been realised, even I would contend among scholars and certainly not in schooling practices.

The very possibility of Archimedean-like foundations and axiomatic truths was pulled, like a rug, out from under the certainty of the Modern (in especially Berger & Luckmann, 1966; Kuhn, 1962/1996) and yet despite continued rug pulling (cf. Foley, 2007; Lakoff & Johnson, 1999), the illusive rug refuses to accede to disillusioning “sense.” Accepting the Cartesian frame, however misleading and distortive it might have been, could be construed as a “set up” of sorts for the inevitable “sucker punch” of lost foundations—that sucker punch as given by, for example, Heideggerian hermeneutics (that is, for those courageous enough to allow such considerations into conscious

presence) along with deconstructive modes of thinking that together called into question any Holy Grail of fixed foundational knowledge.

Accordingly, and yet still governed by the limits of a Cartesian perspective, the impending doom of encroaching “forces of darkness” (as per Descartes, above) has effectuated an anxiety that Bernstein describes as having, in his time, spread “throughout intellectual and cultural life,... affect[ing] almost every discipline and every aspect of our lives... [and] expressed by the opposition[s] between objectivism and relativism... rationality versus irrationality, objectivity versus subjectivity, realism versus antirealism” (1983, p. 1). In my experience across varied halls of academia, public and otherwise, as student and teacher, this same anxiety is likewise alive and well today. It exists, even seems to thrive, in an erstwhile ill-conceived gap between the sciences and the humanities;⁹⁶ but it is fueled elsewhere, I believe: sustained by our own wanting psyches and the solutions to which we cling in service of those psyches.

Bernstein names the uneasiness, Cartesian, because it is an anxiety that congealed and precipitated from something gaining substance and momentum in Descartes’ *Meditations* and building through the ensuing era of enlightened reason. It continues to characterise Cartesianism’s pervasive legacy in and after the Modern, if we are indeed

⁹⁶ Bernstein (1983) comments that Gadamer “is at his weakest in clarifying the role of argumentation in the validation of all claims to truth and in elucidating the nature of criticism in hermeneutical interpretation” (p. 174). He describes Gadamer’s contrast between Method and Truth as “overdrawn” and argues that “this dichotomy obscures the continuity between the *Naturwissenschaften* and the *Gesteswissenschaften*” (p. 174). I am most inclined to agree. In recognising the hermeneutic enfoldment of the sciences as well as the humanities, Maturana & Verden-Zöller join other voices in acknowledging a problem of science and technology:

At the same time, many scientists in the domain of technology have invented new ways of creating more compelling virtual realities that invite our patriarchal imagination, centered in the desire for control, to see in them open sources of power and wealth.... This attitude alienates us from our sense of participation in a biosphere that includes human beings as intrinsic components.... We do not have to do everything that is possible for us to do, we can choose. We do not have to live all the realities that we may create, they are not equally desirable if one has self-respect and social consciousness. (2008, pp. 210–211)

“after” (1983, pp. 16–17). At the heart of Cartesian thinking is the premise of a next-to-godly mind as separate and distinct from a primitive, base body. This is Descartes’ “rigorous distinction between *res cogitans* and *res extensa*” (Bernstein, 1983, p. 115). Articulating and buttressing a western philosophical position of mind over body—both mind and body “ultimately dependent for their sustained existence on God” (Bernstein, 1983, p. 115)—Descartes writes:

Now, the first and chief prerequisite for the knowledge of the immortality of the soul is our being able to form the clearest possible conception (*conceptus--concept*) of the soul itself, and such as shall be absolutely distinct from all our notions of body.... (Descartes, 1641/1901 in Manley & Taylor, 1996, para. 2)

In the second *Meditation* Descartes tells also of Archimedes who “demanded only that one point should be fixed and immoveable” (in Bernstein, p. 16). Following Archimedes lead, Descartes claims that he would be satisfied to “discover one thing only which is certain and indubitable” (in Bernstein, p. 16). If Descartes’ *Meditations* effectuated a crystallisation of philosophically infused, cultural aspirations to what would be known as scientifically accessible truths (Bernstein, 1983, pp. 115–118), then these truths would be grounded in and rationally derived from the most singular, pure, and highly prized of foundational Archimedean points—stable and reliable rocks upon which to anchor thought and action.

Notably, in Descartes’ conceiving, the Archimedean foundation was discoverable through a “procedure of methodical doubt... [wherein, with] proper meditative reflection... [one] bracket[s] or suspend[s] judgment in everything that can be doubted... [to arrive at] self-transparency and self-understanding” (Bernstein, 1983, p. 116).

Moreover, being completely dependent on a beneficent omnipotent God and bearing but finite, partial, access to Godly omniscience, we humans, according to Descartes, only admit error and the falsity (sin) of irrational judgement when we let free will, in service of desire, outstrip the finite bounds of that which can be reasonably understood (pp. 116–117).

Such thinking makes, then, of Adam and Eve's Original Sin a story of every human's abuse of free will—that in grandiosity and ignorance we overstep the limits of our understanding. Reminiscent of the serpent's seductive offering to Adam and Eve in the Garden of Eden, is this not yet another version of a forbidden fruit's promise to feed deep hunger for lost omnipotence and omniscience—severed in infancy by an interruptive teaching, disillusioning world? The difference in Descartes' iteration seems to inhere in his admonishment that the path to right knowing must be through God, not away from Him. Descartes speaks an all too familiar refrain: If we are good enough, all knowledge will be within reach, and the world at our beckoning. And he adds that the way to godliness is through the renunciation of the flesh. If we appropriately bracket the irrational away, stick to essences and inexorable axiomatic truths, and systematically apply strictly discerning rules and Method we can pain-stakingly, and in the likeness of on-high, erect an earthly empire of the good, the right, and the true. It seems Descartes was a man of his times.

Remarkably as well, and consistent with Descartes' anchoring of transcendent reason with godliness, it would seem the sciences arose not in opposition to religious views, but out of them (Gould, 2003). One might even say that science was taken up with the verve of religious ideology. The salient features of Cartesianism (Bernstein, pp. 115–

117) contain “the seeds for the typical Enlightenment contrasts between reason and tradition, reason and authority, reason and superstition [where religion is *not* superstition]” (p. 117). It would take the work of evolving hermeneutic sensibilities before tradition and authority might have opportunity to regain positions of stature as wellsprings for interrogating the wisdom of present reason and unreason.

Moreover—and deeply problematic, for the “unwisdom” of exclusions in the long run—from the very inception of this thing congealed into science, the gap has tended to be thought in juxtaposition with the humanities (Bernstein, pp. 115–117; Gould, 2003). Descartes himself expressed skepticism and even hostility “to the study of history, classical languages, and texts” (Bernstein, p. 118). He viewed any erudition achieved in such endeavours, and through reference to authority, tradition, or opinion, as at best “innocent adornment” and, more gravely, a diversion that could “get in the way of... the serious project of discovering the foundations and building the edifice of objective knowledge” (pp. 117–118).

Bernstein, recounting “Gadamer’s critique of Cartesianism (likened to the criticisms of Heidegger and Peirce)” (p. 118), describes Gadamer’s position as not merely an objection to Descartes’ epistemological, methodological, or even metaphysical claims but, more radically, one that goes to the *ontological* roots of the Cartesian misunderstanding of our very being and our being-in-the-world (p. 118). As antidote, with Gadamer, Bernstein offers philosophical (ontological) hermeneutics as exorcising means to (p. 37) move us beyond objectivism and, with objectivism (its “parasitic...

antithesis”), relativism (p. 37).⁹⁷ I wonder how we might effectuate this exorcising at the level of persons, especially given the uncanny resonance of Cartesian frames with the very conditioning of the human psyche from birth. It seems no coincidence to me that we would think of ourselves in the world in Cartesian terms.

Consider the trajectory of our becoming at the interplay of human physiology and bio-social coupling as per a natural human pedagogy (see Csibra & Gergely, Chapter 5 above), and consider this path in terms of the psychodynamic emergence of a self construing itself in autopoietic becoming—with all the accompanying and traumatic confusions of separation and individuation in relatedness, variably buoyed in attachment with and into belonging. Add the general opacity of self to the self (despite the Cartesian promise of self-transparency) and the covert workings of an unconscious of which, even today, but a few would concede relevance.

Take into account too, the power of the unexplainable event, the miracle, and importantly our own phantasising projections and introjections as counterexamples that immediately work mind out of body—not to mention the enticement, in the face of difficulty, to abdicate responsibility to a willing all-knowing power and then fuse with that power. Then examine the nature of lived experience and the workings of the unconscious at the level of persons such that mind, choice, and intention, before the fact of awareness (arise as they do from unconscious workings), nevertheless come to us as

⁹⁷ In contrast, we might also note that Bernstein (1983) positions Gadamer into the tradition of humanistic thought that traces its origins back to Greek philosophy and that was rejuvenated, and flourished, in nineteenth-century Germany. Bernstein writes that Gadamer’s “entire philosophic project can be characterized as an apologia for humanistic learning. Gadamer, throughout his long career, has sought to show that the humanistic tradition, properly understood, is an essential corrective to the scientism and obsession with instrumental technical thinking that is dominant today” (p. 180). Moreover, Bernstein while drawing his argument from the insights of Gadamer, Habermas, Rorty, and Arendt, also levels particular criticisms. Indeed, he points out that contrary to Gadamer and Arendt “the danger for *praxis* does not come from *techne*, but from *domination*” (p. 215).

other-than-bodily—even though in an earlier time in each life, before the makings of any networked memory, we experienced all our knowing through the body and thereafter did and do construe our understandings hierarchically, through language, upon these originary bodily metaphors. And finally take into account performativity, the public workings of language, and our interpellation into being according to the modes of intelligibility made possible and foreclosed—preemptively so—by, and in, a likewise emergent collective.

Indeed, considering all of these challenges to mindfully inhabiting singular–plural–being, and given both the deception and truth of felt experience as informing one of many possible narratives of self, however are we to grow awareness and wellness beyond the strangeness of bodily limitations on our fascinatingly lithe collaborative cerebral cortexes as imaginative construing mind? Can we bring Humpty back together again when body and mind seem scattered from every starting point? Assuming the narrative woven on these pages, how might such a stance help us make adaptive sense of ourselves in the experience of anxieties given and installed in Cartesian frames? That is, how might we learn ourselves out of anxieties’ limitations such that we become fluidly comfortable enough (too comfortable and we lose our edge and motivation) in singular–plural being? These questions broach for me a direction into a vicinity, at least, of what might be the highest ideal of any educational endeavour.

I dare say, I may be describing a striving for what Richard Rorty named as being a “strong poet”⁹⁸ in the sense of writing one’s life as creative text—but a poet, I would

⁹⁸ The strong poet, and Rorty but names a few acceding to this quality, represents the meeting of a “unconscious need everyone has: the need to come to terms with the blind impress which chance had given [us], to make a self for [ourselves] by redescribing that impress in terms which are, if only marginally, [our]

add, very much in a collective *with*. I do believe that, to get there, we will need to draw on the wisdom of the sciences and the humanities, thought together, synergistically and dialectically so. But then, “It always seems impossible until it’s done” (attributed to Nelson Mandela).

Turn now to an interplay, to borrow the language of complexity, of “top down” Cartesian constraints with “bottom-up” challenges of individuation and relatedness. Put differently, consider the challenge of singular plural being at the heart of the narcissistic struggle pressing individual (and perhaps collective) selves into minimalist being.

Constructed “in Rationality”: Is There a Place for me Here?

Children develop in one way or another according to the emotioning that they live, *regardless of whether what they live is real or virtual* [emphasis added], true or false....

Our children will become adults of one kind or another according to the psychic space that we adults generate as we bring forth different virtual and non-virtual realities. (Maturana & Verden-Zöllner, 2008, p. 212)

Four hermeneutic windows.

1. A grade one student is asked a series of questions about his likes, about things that make him unhappy, and things that make him worry. In response to every question, he chooses the happy face and says that he is always happy and never worried.

—What if you forgot your mitts today would that make you worried?

—No, I’d ask the teacher.

—What if you were in the mall and couldn’t see your mom?

—I'd ask a grown up to help me.

And so it goes.

Indeed, I met a child today who does not admit to himself the possibility of worry. And then I notice that same child, late getting into class after recess. His entire demeanor speaks of worry, then frustration, and budding anger as the teacher says, "It's time to come into class now." He is muttering to himself on the unreasonableness of her demand.

I walk over and ask him if I can help. His snow pants keep falling. He can't get his lunch box through the zipper of his backpack, and the sandwich in his hand is getting squished. He is a bundle of fretting worry but the worry remains unknown to himself because he clearly does not allow it. His worry is "unreasonable."

2. Matt's parents recount to me, on three different occasions—separately in our first interviews and then together in a later conversation—a story about his first grade. His teacher had asked him his phone number and he had not responded. In a conversation to his parents expressing concern over Matt's understanding of numbers, the teacher had mentioned his inability to recite his phone number. Later, in the car, Sonia and Warren asked Matt if he knew their phone number and Matt rhymed it off.

—Why didn't you tell the teacher? they asked.

—You told me not to give my number to strangers, came the reply.

Indeed, could it be that a narrative about a child struggling in mathematics, or at least the teacher's perception of a difficulty in mathematics, is cloaked in a delightful story of harmless innocence?

3. My father was on another rant. Maybe he'd been drinking again. I stared up that familiar beautiful old staircase at mom's face.

“Is he angry at me?” I asked.

“Oh no.” she reassured.

I believed her, walked up the stairs—and met terror and surprise. She had lied.

A pattern of pretense comprised of telling or being told lies “can shatter one’s trust as well as one’s sense of safety and stability in the world” (Lachmann, 2008, p. 125). Lachmann cites Ferenczi (1933) and Balint (1969) in considering the traumatising effect on the child when confirmation or validation of events that occurred are sought by the child and when the adults in that child’s life, especially if they are attachment figures, “lie, deny, or pretend that what happened, or what the child saw or felt, did not happen” (p. 125). In exploring the effects of lying and pretense, he speaks of violations of expectation in terms of humour, creativity, and perversion, and emphasises that in the case of the latter: “A pattern of [intentionally] establishing a feeling of trust and an expectation of reciprocal affective responsivity, just [for the purposes of]... violat[ing] this expectation, constitutes the essence of perversion” (p. 146).

4. The day after Matt came home thinking mom was “the problem” (March 4, 2010):

Sonia: Whatever he took away was... I mean, I think, he was pretty sure that I was the one that was being mean to him.

Lissa: I didn’t think anyone was being mean to him.

Sonia: Well you know, he externalises a lot. Many teens, you know, it can’t be me, it’s got to be outside of me, so you find some place else to externalise your emotional state. But also, less important than that, he just said, I can’t do this. I

said you can. It's a matter of steady consistent effort. You can do it. He wasn't entirely convinced by my saying that of course.

Lissa: And this being?

Sonia: Unclear. And then he didn't want to talk about it. *This* being getting Section 3 done, or *this* being sort of a bigger picture, or I don't really know. [My email agrees that Section 3 is too much but I didn't directly communicate that to Matt.]

Lissa: Overwhelmed.

Sonia: Yeah, that's exactly right. I don't think he could even have explained in a concrete and specific way what it was that he felt. So I tried to assure him that it's about consistent steady work and effort and you'll do it. So that is what it is.

Lissa: Actually when I got your email I was alarmed, I went "What did I say?" and then I thought, wait I have it on tape. Oh phew. I didn't say anything like that. I was actually relieved because you know you second guess yourself and then maybe there was a tone or something, but then, no, no. But I did, I wanted him to understand...

He said, "Trust me there's lots of kids that don't do their homework."

"Trust me, I do know this... but it *does* catch up to them." I said, "You don't want to be... you have this ability, *you can do this*... which is really reinforcing, *we're both saying the same thing*... but, you don't want to not do it because you'll find yourself in this place... where you end up in a boring job. You don't want to be there, because you're bright, so there you will be if you don't get into

a job position where you don't have stimulating and interesting things, it's going to be boring.... So bear down.

Denials and Cartesian conundrums: Admitting one's real.

If maths anxiety has already been generated along the history of the subject and symptoms are already present, it is useless to try to suppress them following the path of love because anxiety will maintain its repressive force and the repressed material will emerge as symptoms. What we have to do is to reopen the situation that produced the anxiety and support the subject in redressing his/her dealing with the Other's desire. (Baldino & Cabral, 2008, p. 72)

What happens to a self when "base" bodily affect and tumultuous being is dismissed away for its impermissible irrationality; when fear in the dark—of the ghost that is the housecoat hanging on the door or the monster that hides under the bed—is rendered silly; when one's anxieties are discounted and disallowed? Are we any safer?

Now, reconsider the above narratives in light of a Cartesian imperative to devalue and dismiss—as at best irrelevant and distracting, at worst something too frightening to admit—the obscure, tumultuous, or seemingly nonsensical and limiting signals of a bodily self. Such a position on affect hails to that underriding belief, ensconced in Cartesianism, that one attains to realms pure, rational, and godly—touching and participating in the universal—by transcending the particular. In the Cartesian spirit, base psychic and affective selves are to be managed, suppressed, and bracketed out under pain of the sin of allowing ignorance and irrationality to misappropriate free will in their service (Bernstein, 1983).

Importantly, one need not be consciously privy to these machinations in order for them to be at work affecting us. Indeed, at every turn, it is my belief that they do. Such is our western “Cartesian” persuasion that, for example, whether or not we believe in a godly power, we are drawn to adulate at the altar of that which professes certainty under a particular banner of rationality—and to denigrate that which does not.⁹⁹ At the same time, we are each drawn to create our own fictions that deny those very things that frighten us most. The residue of unattended, submersed affect conditions how we subsequently condition our children.

Oddly, or perhaps even ironically, of the various alternative “ways of knowing,” a post-empirical, post-Cartesian science, largely taken up into psychoanalytic discourses of childhood development and informing psychoanalytic practice, signals a growing scientific sensibility that refuses to acquiesce to pleas for certainty and proof. Advancing the counternarrative to Cartesian duality and disembodied reason, Maturana and Verden-Zöller write that “now even our scientific thinking has led to recovering the interplay of systemic analogical and local causal reasoning in the understanding of that which we connote in daily life as reality” (p. 210). Indeed, a newer generation of sciences, offspring of patriarchal scientism to be sure, is nonetheless maturing with the interpretive spirit of emerging hermeneutic and psychoanalytic ethicalities. I optimistically understand this science as a humbler, more graciously-fallible—though determined still—human endeavour affirming, on multiple fronts, that our psychic existence, conscious and

⁹⁹ I cannot help but muse: Considering the religious ideologies originally conditioning Cartesian rationalism and thus schooling, how realistic is this separation of church and state. It strikes me that both are intimately linked in deep underground rhizomatic ways.

unconscious alike, and all that we live in it, is above other posited reals never a virtual one.

No matter whether we are aware or not of what kind of reality we live at any instant, all the realities that we live affect us in the same way in the emotional dimensions of our psychic existence, because there is no virtual emotional life. (Maturana & Verden-Zöller, 2008, p. 202)

The Cartesian reality will be virtually real as long as we continue to construe it thus. And there seems no doubt that a predilection towards Cartesian understandings—fueled by and fueling a narcissistic want for omnipotence and omniscience—continues, alive and well today. Though this be no longer apt-enough frame, the more pressingly relevant question may well be: Can we choose to choose otherwise?

Consider one example, illustrative of the insidious ways this Cartesian reality, masquerading in apparent difference, participates still in something that is surely no otherwise at all. Consider an instance of New Ageism: *The Lamp of Love: Stories by Sathya Sai Baba* was, this past year, a prescribed text for a graduate-level education course in a Canadian university. Albeit a highly irregular course (or so one might hope), it did exist in 2011 with variations on the theme infused in various places throughout the faculty. Tellingly, in the text's introduction, David C. Jones, course professor and text editor, writes that the children of the "technological civilization of the West...[are b]orn to a rich heritage... [but] are growing up destitute and helpless" (Baba in Jones, 2010, p. 5). This he says owes to the sheer "laziness" of people who refuse to dedicate themselves to the meditative task of transcending the body en route to the "Universal" (Baba in Jones, p. 6). According to Jones, each of us "'is the repository of Divine Might, of the

Imperishable *Atma*' [Baba].... [—that] eternal Spirit within, the Self, the breath of God that animated everyone" (Jones, pp. 5–6). Drawing on Baba who, not unlike Descartes in *The Meditations* (in Bernstein, 1983), preaches the transcendence of mind from body into the divine, Jones describes that divine as the "Lamp of Love" (p. 6). Citing Baba, he writes,

The 'I' that lives within the body is like a lion in a cave,' Baba teaches.... 'Let it come out, renouncing the petty possession. So long as you crib yourselves into the body-consciousness... you are the lion moping in the musty cave! Roar, I am *Brahman* (the Eternal, Changeless, divine Reality), I am all this and more, I am all this is, was, and will be—and littleness, time, space, ego, all will flee from our heart! You will be Love, Love, Love—and nought else.'

And love is ever expanding, deepening its embrace, enlarging its kinship, ensuring the gentle *mastery over oneself* [emphasis added]. (Jones, 2010, pp. 6–7)

In 1983, at the same time as Bernstein was writing *Beyond Objectivism and Relativism*, Lasch was writing about narcissism and "minimal selfhood," invoking a great many of the same terms and underlying issues. Lasch writes of "the party of Narcissus" as a counterculture that rails against the industrial "pathology of purposiveness," but merely reverses the situation when it errantly rejects practice along with technique (as though these were interchangeable), advocating instead "a renunciation of will and purpose" (p. 255) in favour of a return to what Niebur (in Lasch, 1983) names as "the perversity of romantic naturalism" (p. 257).

Phronesis and techne.

Lasch writes, “The antidote to instrumental reason is practical reason, not mysticism, spirituality, or the power of ‘personhood.’” (p. 254). Whereas “*phronesis* or practical reason describes the development of character, the moral perfection of life, and the virtues specific to various forms of practical activity[, t]echnique... concerns itself exclusively with the means appropriate to a given end” (pp. 253–254). Notably both Lasch and Bernstein point to, what I would call tragic, the substitution of technique for wisdom. In its newest iteration, technique at the personal level of self-governance is given as meditation and yoga—Eastern mind-conditioning practices of technique stripped away from their wisdom-traditions. Eckhart Tolle, popular guru admonishes us to let go of worry, and the refrain, not unfamiliar, feeds our unconscious wishing and conditioning:

Worry pretends to be necessary but serves no useful purpose.

Life isn't as serious as the mind makes it out to be.

The primary cause of unhappiness is never the situation but your thoughts about it.

Acknowledging the good that you already have in your life is the foundation for all abundance. (Tolle, 1999)

It seems the little fellow in Grade One already embraces these notions, indeed, he uses them to deny himself out of being and they condition in him an anger to a non-compliant world at every turn interrupting his self-conditioned illusion.

On a different note, I understand this usurping of *phronesis* by *techne* to underpin, even something as seemingly innocuous and acceptably “right” in a democracy of, for

example, the current penchant for anonymous student evaluations of teachers. Yet, these conventions too, symptomatic of a technology of the “customer is always right,” are deeply problematic. If we continue such routines, I wonder how long before educative institutes will be advertising, in manner akin to Walmart: “We will not be undersold!”

The unwisdom inheres in this: The teacher that perturbs—that prompts a learner to self-question by admitting a troublesome interfering world—is not typically the one getting the high ratings. Would that a teacher take the docile path and reinforce instead the routes that students are content to follow, however ill or thoughtfully conceived. As if prescient of what was coming, Winnicott, advocating creativity, recognised that, as a way of living in the world, compliance is psychiatric illness (1971/2005, p. 87).

It is creative apperception more than anything else that makes the individual feel that life is worth living. Contrasted with this is a relationship to external reality which is one of compliance, the world and its details being recognised but only as something to be fitted in with or demanding adaptation. Compliance carries with it a sense of futility for the individual and is associated with the idea that nothing matters and that life is not worth living (p. 87)

Ah the illness of zombie-like being! Without self-reflective questioning, contextualised and prodded by world, how is one to even gain a sense of the wellness and aptness of any path of singular plural becoming? Contrast the teacher who caters to this habit of entitlement, who in guru-like fashion joins students in a cult of relativism gone awry, where everyone’s knowledge is of equal worth, and bare-faced opinion, any opinion, comes to be valued with equal merit, no matter the degree and quality of

reflection, study, courage, and humility *with world* that has gone into such opinion-making in the first place.

Deeply problematic too, is a measured and measurable weight-of-being placed upon selves and, at the same time, the “wiping of hands” of complicity in the conditioning of other possible selves. The logic of catering to minimal selfhood is one of ministering entitlement as the natural right of self-legitimised knowing (as if we could ever be privy to ourselves as property of our own agentic making) and it somehow gets caught up in a romanticised return to the natural as incorporated in an exultation of being, any sort of being one chooses to be and to enact.

If *techne*, with what approaches Machiavellian instrumentalism, has displaced *phronesis* in a “pathology of purposefulness” (Lasch, 1983, p. 255) then a romantic return to the natural, coupled with a complete rejection of all things “Westernly” scientific, because “science *is* ideology” and the “humanities have never needed the sciences” is, in consideration of mounting local and global concerns, surely not a wise-enough approach to take either. I understand both Bernstein and Lasch to be advocating a reevaluation of a wisdom-conception of practice—practice in the genre of Gadamerian play. Lasch writes (and I adamantly agree):

Confusion about the distinction between practice and technique is closely bound up with confusion about man’s relation to nature. Human beings are part of an intricately interconnected evolutionary chain, but self-consciousness—the capacity to see the self from a point of view outside the self—distinguishes humanity from other forms of life and leads both to a sense of power over nature and to a sense of alienation from nature. (1983, p. 256)

And therein lies the rub: Our capacity-to-self-consciousness turns on first learned adaptations in a natural human pedagogy of attunement. It is here that children begin to develop a theory of mind of the other in terms of the self, to be able to “mentalise” such that we understand that, although we may see the world in one way, another may legitimately have a different view. It is out of such theories of mind, such mentalising capacities, that we are able to hone and become empathising beings¹⁰⁰ existing in community and at times losing sight of who we are, which are our needs, which the others and whether we accede to the others’ needs at bottom to meet our own, or the other way around.¹⁰¹ Like no other species we are collectively enmeshed and the degree to which we may become privy in awareness to that, may well signal the degree of our ability to be well in the world.

In the mirror.

Returning to the issue of the mirror and learning oneself through the mirrored images reflected by a particular and a general other (and recognising this to always be a reciprocal relationship, given the meaning of a gesture in the reaction of the other): In terms of answering the question: “Can you see yourself in the Cartesian mirror?” it seems then, as a first observation, that the Cartesian one shuns at least some parts of self— notably, the more base bodily aspects and in the newest naturalistic mode, the mirror shuns that which is deemed unnatural, practiced, studied, or authoritative. These worldviews seem but shadowed reflections each of the other.

¹⁰⁰ I do not mean to advocate any trivial romanticised notion of empathy. Rather, I invoke something approaching Kohut’s 1966 definition of empathy as “the mode by which one gathers psychological data about other people and, when they say what they think or feel, imagines their inner experience even though it is not open to direct observation” (in Lachmann, 2008, ,p. 9).

¹⁰¹ I do believe that I am not conflating secondary narcissism here with empathy, but that particular investigation must be a matter for a different paper.

And of course none of this is new news. Nietzsche (1968/1895, *Maxims & Arrows* 7) said, “What? Is man merely a mistake of God's? Or God merely a mistake of man's?” The Bible teaches that we are made in the image of God and that our life journey is to seek, at a minimum, to cultivate within ourselves that likeness—all of which depends upon who decides what that God or spirit realm advises. It may be the voice of Jesus as the son of God for some and a prophet for others, or it may be the voice of an ahistorical, mythical, avatar people, able to live in and with a natural world. At the same time, the rhetoric about opening oneself to the eternal or the natural (as anti-synthetic) within mandates an ironic foreclosure of coming to know, shape, and give presence to one’s own, and humanity’s historical likeness, including even the darker sides, however fraught they might at first seem. In the Cartesian view, that which is dark is to be repressed in order to step into the light.

Psychoanalytically speaking, we might well consider the Cartesian invocation as to remain mired in what bears disturbing resemblance to that more primitive split of self-states described in etiological accounts of pathological narcissism. In early development, infants encounter different self-experiences of positive and negative self-states. In effect, these self-states develop as separate experiences with subsequent resolution of that split constituting a developmental accomplishment.¹⁰² For the narcissist, it is thought that no

¹⁰² Likely explanations for these occurrences emerge at the confluence of research in neuroscience and attachment systems: Infant self-experiences begin in the primal limbic brain as separately entrained procedural (i.e., implicit, nonverbal, & not reflectively conscious [see Daniel Stern, 2004, p. 113]) memories of positive and negative self-states. During the first two to three years of life, the infant’s hippocampal region has not yet developed the capacity to organise these states into retrievable declarative memory (i.e., symbolic, verbalizable, narratable, and reflectively conscious [see Daniel Stern, 2004, p. 113]). Accordingly, the immature brain of the infant depends upon an attachment system whereby coupling with a significant other functions to appropriately amplify, reinforce, and attenuate affect in ways that help resolve the initial positive-negative affect split (Cozolino, 2010, Part V; Kendal, 1999, pp. 79-86; Kernberg & Caligor, 2005, pp. 130-131). Commenting on the way the sense of self is organised “around affective

such integration takes place (Kernberg & Caligor, 2005, p. 140). Instead, Kernberg describes a grandiose self that fuses with an idealised parent imago in a constellation of: self, other (as internal object relation), and self-defined ego ideal. Negative affect is expelled from self-experience, along with punishing primitive persecutory aspects of self—the consequences of which prime externally-directed aggression. Thus, the grandiosity of pathological narcissism is but a mal-adaptive surface-simulation of healthy functioning to hide and protect a false, underlying, diffusely organised “true” self (Kernberg, 2008; Kernberg & Caligor, 2005; Tonkin & Fine, 1985). Kernberg and Caligor describe the narcissist:

In the narcissistic personality the pathological self absorbs both real [who I think I am] and idealized self [good me] and object [others] representations [in particular the idealized experiential sense of others held in mind (Kernberg, 2008, p.303)] into an unrealistically idealized concept of self. This structural development leads to a parallel impoverishment of the system of internalized values [vs. a healthy tempering integration of the idealising “be this” with the persecutory “don’t be that”], where we see a predominance of persecutory superego precursors over idealized structures [if ideal self fuses with me then it leaves persecutory voice untempered]. In this setting, persecutory structures tend to be projected [motivating aggression], interfering with later development of more integrated superego functions (Kernberg, 1975, 1984, 1992). As a result, the narcissistic personality often presents some degree of antisocial behavior. (2005, p. 140)

experience” Teicholz says, “Infant research suggests that the implicit/procedural (Boston Change Process Study Group 1998), subsymbolic (Bucci 2001), or enactive (Lyons-Ruth 1999) memory system developmentally precedes the symbolic, verbal, declarative, or reflective mode of psychic processing; but once both systems have developed, they operate side-by-side” (2009, p. 81).

No small wonder that in Blake's depiction of the Book of Job, Milner notes, in the first plates, Job's righteous face imaged as the face of God (1956/1987a, p. 170). If we are made in God's image then, with easy slight of reciprocal hand, God can be seen as made in our image such that the view we project onto the figure of omnipotence and omniscience becomes our own entitled one. Narcissism is but one step removed from Cartesianism.

Milner's analysis of Blake's work witnesses a pious and godly Job brought to suffer at Satan's hand. Perplexingly, such suffering is visited upon Job in the very moments of his most virtuous hour; that is, when he has apparently succeeded in subjugating and eradicating his unruly, nonsensical elements of self—those parts failing to align with orderly reason and linear logic. Indeed, in my work with mathematically anxious students in general, and in my in-depth study with one such student in particular, the desire for and expectation of clear steps outlining how to do the mathematics is consistently characteristic. These students have come to understand doing mathematics as compliantly following instructions and when the instructions fail them, then so has the system.

The difficulty—as the psychoanalytic tradition (supported with/in neuroscience) tells us—is that there is important “real” “sense” in the seeming virtual “nonsense” of our unconscious minds. Indeed, who we are, what we know, and the way we move in the world is very much a consequence of that unconscious. We can no more eradicate or rise somehow beyond it than we could succeed in cutting out our heart. Indeed we rise through grappling with it, in collective historical awareness, that allows the embracing of self and life from a position of non-complacent, radical self-acceptance.

Yet, in the view advanced by Descartes—and Sai Baba, it would seem—there is no legitimate place for an embodied unconscious in the mirrored reflections of a Cartesian self. We are told that the other, altern self within is to be “gently mastered” and the image I conjure of that body may just as well be one of a packing horse on the back of which one might attain nirvana, enlightenment, or some other spiritual oneness with the universe.

And somehow Blake’s words seem à propos here when he writes: “He who would do good to another must do so in minute particulars: General good is the plea of the scoundrel, hypocrite, and flatterer; for art and science cannot exist but in minutely organised particulars” (c.1803–1820). A kind of grandiosity sits in the subtext of the love espoused by the likes of Sai Baba and is effused through the work of Eckhart Tolle. It seems not to account for the particular conundrums of everyday enactions of *being with*. Francisco Varela puts it thus, “Situations in which we exercise ethical expertise far outnumber those in which we must exercise explicit ethical deliberation” (1992/1999, p. 23). It is not so easy to enact habits of “loving well,” leastwise not in the everyday places, without some degree of practiced wisdom, study, and experience making a kind of opening sense of possibility to and with the world—that is, within the social and not as self-extricated above and beyond it. As Varela continues:

Furthermore, we acquire our ethical behavior in much the same way we acquire all other modes of behavior: they become transparent to us as we grow up in society. This is because learning is, as we know, circular: we learn what we are supposed to be in order to be accepted as learners [such that]... an ethical expert is nothing more or less than a full participant in a community. (p. 24)

In the Collective Eye: Narcissism Pathologised and Medicalised

We build up our inner world on the basis of our relationships to people we have loved and hated, we carry these people about with us and what we do, we do for them—or in conflict with them... even when these first loved people no longer exist in the external world, we find external representatives of them both in new people who enter our lives, *and in all our interests and the causes that we seek to serve.... [H]owever impersonal our activities may seem to be, they are fundamentally to do with people...* [emphasis added] (Milner, 1956/1987s, p. 189)

To collect ourselves again: The present effort, thus far, might be apprehended in a question: Considering anxiety, mathematics or otherwise, as augmented in a socio-cultural ethos governed according to a still-pervasive Cartesian unconscious, and also anxiety thought through developmental psychoanalysis and complexity, how can we move our understanding of the problems and challenges of negotiating learning (as human life's becoming with) in well-enough, adaptive, mindful ways? Moreover, how can we in educational conversations and practices attend to the conditioning circumstances that press the contraction of lives into minimalist being—doing so without joining in and fuelling unhelpful discourses bent on pointing up blame and guffawing over the state of this or that populace “these days?” Indeed, I doubt that “these days,” when considered against the grand fluctuating course of human acts on this planet, are markedly worse or better than times before or times to come. In any case, we won't know.

A popular preoccupation clustering under the rubric of narcissism—that term uttered too exclusively in derisive tone—increasingly comes to be foregrounded in public

discourses about, especially, the newest generation of young adults. Yet narcissism construed as villain is already Narcissus poorly and variably understood. Indeed, one ought not assume that researchers, theorists, and therapists purporting to write about and study this so-acclaimed villain are indeed considering the same construct. But the preoccupation is distracting isn't it? And maybe that is just the point of the movement of anxieties in a culture that breeds minimal selves, leastwise minimal selves escalating in terms of public visibility it would seem. Interestingly such "visibility" comes as contradictory consequence: where retreat on the part of selves (some more than others, self-protecting in a thin skin of grandiosity), when taken *en masse*, assumes the shape of a collective "zombie-like" absent presence.

Among the many transformations¹⁰³ issued by the third version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III), narcissism became defined by its manifest symptoms, instating the slow ebb of many aspects of its underlying etiology into the undertow—or more aptly put, into a collective public unconscious. In 1979, and developed according to the DSM-III categories, Rasking and Hall conceived the Narcissistic Personality Inventory (NPI; in Emmons, 1987). It was the first "objective self-report inventory of narcissism as a *normal* [emphasis added] personality trait.... [and] it opened the door for the empirical investigation of narcissism" (Emmons, p. 12). The inventory was based on the five DSM-III diagnostic criteria of *pathological* narcissism; that is "extreme manifestation" of: grandiosity, "preoccupation with fantasies

¹⁰³ The list of symptoms and standardization of mental illness spawned a number of changes: a burgeoning research and economic industry in psychopharmacology; the displacement of psychoanalysts by psychologists, social workers, and counselors as the cheaper alternatives for talk therapy—leaving psychiatry to drug dispensing; and DSM criteria underwriting decisions in courts, by insurance companies, managed care organisations, research, and government (Mayes & Horwitz, 2005, p. 265).

of unlimited success, power, beauty, or ideal love,” exhibitionism, “entitlement,” and “interpersonal exploitiveness” (p. 12).

Fast forward to the present and we find social psychologists, Jean Twenge (author of *Generation Me*) and W. Keith Campbell (researcher of narcissism), who—using the 1988 NPI as their principle tool—popularise their findings on the problematic rise of narcissism¹⁰⁴ in, *The Narcissism Epidemic: Living in the Age of Entitlement* (2009). In the chapter entitled “The *Disease* [emphasis added] of Excessive Self-Admiration” they differentiate between pathological narcissism and simply “*being highly narcissistic*” (p. 22) in terms of the inventory. According to Twenge and Campbell, “the clinical definition of NPD [Narcissistic Personality Disorder] has provoked debate among psychologists” who argue over two sorts of NPD: the “vulnerable, and psychologically empty.... narcissist... [and] the classic outgoing ‘cool’” (p. 23) type. The authors then announce their focus on the outgoing form of the narcissistic personality (and not the disorder), but qualify their focus:

“Normal” narcissists are much more common and thus potentially more destructive [emphasis added]. Most people at the 90th percentile on the NPI scale, for example, don’t have diagnosed clinical NPD, but they cause plenty of trouble for the people around them—maybe even more than those with NPD. (Twenge & Campbell, 2009, p. 23)

¹⁰⁴ Notably Twenge and Campbell’s multiple charts tracking narcissism over the years have been restricted to a single demographic: the college student. Accordingly a rise in NPI scores says more about the effect of well-documented shifting schooling practices over the years (raised expectations placed on teachers and concomitant reduced expectations on students) and the protraction of youth in an age where a college degree is increasingly the norm. That students today enter college with seeming inflated opinions of themselves, says more about mismatches between expectations given of them in early schooling versus college versus life beyond school. They will need to acclimatise. The narcissist would not be able to. If we want to determine if there is a rise in narcissism we would need to assess, at the least, whether self-opinions were grandiose as against some sort of context to which they’d had time to adapt.

Having explicitly eliminated both the “vulnerable” and “pathological” types from their study they go on to articulate seven myths of the narcissism that remain (pp. 24–56). The subtext of their articulations however: (a) repeatedly demonises narcissists and works against the notion of healthy narcissism; (b) dismisses psychoanalytic perspectives on the etiology of narcissism, as bordering on ludicrous and reduced to notions of “an ‘empty’ or ‘enraged’ self, hidden low self-esteem, or a deep-seated sense of shame” (p. 25)—the very category they’ve eliminated from their study; and (c) either intentionally, though insidiously, undermines elements of the “talking cure” *or* reflects their own ignorance about psychoanalytic approaches to working with NPD—I’m not sure which (p. 28).

Thus, like anything else suffering the reduction of operationalisation into standards, the measurable and measured parts of constructs have an insidious habit of becoming the constructs themselves. As in the standardisation of learning (whittled down to measurable outcomes), so too in the medicalisation of mental illness (whittled down to measurable symptoms). The genre of the Twenge and Campbell report was made possible by the DSM-III of 1980 that installed a “revolution... that rapidly transformed... mental illnesses ... from broad, etiologically defined entities that were continuous with normality to symptom-based, categorical disease” (Mayes & Horwitz, 2005, p. 249). Prior to the DSM-III, and over for the first half of the twentieth century, analysts viewed overt symptoms as “reflecting” and “disguis[ing] broad underlying dynamic conditions or... reactions to difficult life problems.... [where] all mental disorders... [were] reducible to one basic psychosocial process: the failure of the

suffering individual to adapt to his or her environment” (Menninger, 1963 according to Wilson, in Mayes & Horwitz, 2005, p. 250).

Kernberg and Caligor (2005) counterpose psychoanalytic theory, in the present and following Freud, as against both the categorical schema of the DSM–III and statistically derived dimensional models that link behavioral traits and establish general theories (p. 118). They locate, in the “tendency to anchor diagnostic criteria and... empirical research... to observable behaviors... [, t]he problem... that the same behaviors can serve very different functions depending on the underlying personality structures” (p. 119).

Always conceding inevitable interpretive biases that both limit and make possible perception, the approaches of psychoanalysis and neurophenomenology, rather than focusing on such reductionistic technologies of the “observable,” concern themselves with those mind-body histories that condition what comes to be projected onto the limited screen of the perceivable. In particular it could be conceived that psychoanalysis attends to the hermeneutics of psychic narrative construction and co-construction of self-other identities, while neurophenomenology attends to a kind of hermeneutics of bodily narrative construction and co-construction of self-other bodies. Together these mind-body perspectives work an understanding that reaches beneath surface manifestations of the difficulties and challenges of being well.

A more mindful consideration of minimalist tendencies, in general, invokes a literature on narcissism, anxiety, and trust. I open a differently narrated story of minimalist selfhood (as motivating narcissism) with Anthony Giddens’ succinct summary connecting existential anxiety to primary attachment relationships.

Narcissus, Prometheus, and trust.

Basic trust presumes a suspension of doubt, but... the fragility of this state and the possibility of a “suspension of trust”... threatens to bring back existential anxiety.

The suspension that enables trust has to be learned in infancy through the ambivalent experience of love from caretakers on the one hand and the caretakers’ temporary absence on the other, whereby the infant develops the ability to reach a state of trust which “brackets distance in time and space and so blocks off existential anxieties” (p. 97)... *[T]he faith in the loving caretaker’s return “is the essence of that leap to commitment which basic trust—and all forms of trust thereafter—presumes [emphasis added]”* (p. 95). The infant’s anxiety can be generalised to the problem of ignorance that actors face in any social encounters with others whose actions and intentions they cannot fully know or control (Giddens, 1991; in Möllering, 2006, pp. 116-117).

Aware and suspicious of differences we cannot know, the casualty of the postmodern¹⁰⁵ entails in an emerging appreciation of the limitations and impossibilities on even any “accurate” awareness of degrees of agreement, much less consensus on the right and the true. Having lost trust in the Cartesian promise, the postmodern condition is one to flounder over “Whose knowledge, whose “right,” and whose “being” is of most

¹⁰⁵ “As a broad style of thinking, post-modernism is deeply suspicious of such notions as objectivity, truth, and reason, because it sees the world as ungrounded, fragmented, diverse, and contingent” (Frie, 2009, p. 6). There is a parallel that could be framed here between two minimalistic gestures, both expressions of narcissism: A modern belief taken to extremes of illusionment (aligning with Fonagy & Target’s “pretend” mode of experience, 1996) would correspond to the analyzable narcissist versus the fragmented post-modern stance taken to extremes of disillusionment (aligning with Fonagy & Target’s “psychic equivalence” mode of experience, 1996a) which would correspond to the unanalysable narcissist also termed borderline (residing between Freud’s categories of the psychotic and the neurotic, hence the term borderline, as in borderline psychotic). (See Tonkin & Fine, 1985, for a discussion of narcissism and borderlines in these terms through the work of Heinz Kohut and of Otto Kernberg. Also see Lasch, 1984, p. 284)

worth?”—these very questions and their myriad manifestations arising out of continued ascription to the Cartesian ideal and its unsettling either/or dilemma: Either we can get at absolute truth or all is relative.

Foremost trust researcher Guido Möllering reminds not to underestimate “the power, but also the fragility, of the ‘as if’.... Trust does not rest on objective certainty but on ‘illusion’.... on the fiction of a reality in which social uncertainty and vulnerability are unproblematic” (2006, p. 112). The postmodern realisation that we have been assuming far too much, could be thought of as a loss of an “as if” that ushers its own existential crisis. A socially constructed fiction that is “produced intersubjectively through interaction with others and through institutionalised practices.... [trust also] needs to be achieved and sustained psychologically by the individual” (Möllering, 2006, p. 112). Perhaps the present crisis, if crisis we can fairly call it, owes to our having reached the limits of sustaining, individually and collectively, this “fiction of trust” in even the possibility of an absolute certain, right, true, absolute, and accessible “real.” Perhaps we could find our way to trusting something else, something akin to trusting the processes of life, not in blind faith but in deepened sensibilities to what is at play.

Scientific omniscience and technological omnipotence has been for many revealed as sham. Conspiracy theories abound. Still seeking some alternative expert to trust, many publics turn to the natural, the spiritual, and all manner of alternative as reliable source and purveyor of truth (D’Amour, 2008). Having felt duped and humbled at the hands of the Modern—banished anew, as it were, from that euphoric union in the first garden, with all its powering possibility—one confronts the struggle of selfhood in a

world stretched to its limits and recoiling back, that refuses our ultimate subduing, and that, in return, is thus painfully felt as subjugating us into solitary failing—again.

For some, science and Lucifer merge. And, in a gesture emulating the father and assuming to varying degrees the prickly, offensively defensive wrath and hubris of a Zeus, a minimal self steps behind pretense of *not me* into an abysmal void wherein *not me* resides unacknowledged—indeed being the already admitted inadmissible. Awash in threat of minimalist selfhood—and in narcissistic gesture attempting to hold suffering and loss at bay—a path for survival entails either a resurgence of Promethean powers or their utter denouncement: Take up a stance that is either pro-Modern or anti-Modern where Modernism entails all things objective, reductive, and metanarrative—as if these notions, having proven themselves as not omnipotently useful, could never be humbly that.

In one way or another, given striving for Cartesian perfection, anxiety becomes that teetering on the edge of the pure, the legitimate, the worthy enough to belong—oh the vertigo: Counter-balancing acts of leaning, to one side or the other, are effectuated by pointing out the failings of others, these overcompensations enacting flailing attempts to stave off the alienating fall into empty pretense or abject failure.

Recall Matt and his parents decrying his experiences in school at the hands of poor teachers and failing practices. Recall Matt and his parents: poised, able, and yet, in forceful denial of deeply felt shortcomings—these exposed only rarely as fleeting hints of uncontained desperation, infusing both gesture and tonality. Hints of barely masked or denied disappointment, even despair—as manic phantasies threaten impending psychic equivalence (the mode of being when the phantasy I imagine *is* real)—peak through

during moments when (schizoid) pretense no longer holds up. I recount evidences of two such instances (the second to remind of an earlier narration).

1. I joined Matt's parents to watch him at a rep-league hockey tryout. That he was trying out at this level had been recounted separately and with pride by father, mother, and son. But sitting on the bleachers with them I hear nervous laughter. I know enough about hockey to recognise that Matt is clearly out of his league. His parents each in their own way explain that Matt can't skate like the other boys because he's late to the game, but he has a "wicked" slapshot. I watch and worry over his predicament. I wonder at what level he is aware. And I cannot but note the uncanny similarity to Sonia's having him write tests, against my advice and for which he is not ready. I wonder about this practice of throwing someone into the lion's den. Is it to toughen him up?

2. (Feb. 1, 2010) Of one such testing instance (the last in a two-year intermittent habit) Sonia writes: "I have to confess I was too optimistic about what he would be able to do while we were gone—too much happening and too little ability to focus. He really didn't accomplish any school work... My bad!" Notably, in "my bad" she makes light of the issue—a strategy used to forestall oppressive forecasts. A half-year later, in response to another of my pretense-interrupting messages, we have the following telling exchange:

Lissa: (Sept. 21, 2010) Hi Sonia, I am writing to let you know of a growing concern and to explore best ways to address it early.... In any case, we'll be continually running into these kinds of moments unless the intensity of his approach to the work changes.

Sonia: (Sept. 21, 2010) Overwhelming and disappointing, a more substantive response later.

Sonia: (Sept 25, 2010) I always hope that Matt is going to get on track and then step along at the same pace as others. But that may not and need not happen with math. I want him to complete Gr 10 math in a timely fashion but I think it is important for him to learn the math too, not just get ready for the test.... I trust your diagnosis [emphasis added] of his current knowledge and your judgment about what he needs to do to develop a real understanding.

The tragic story of school is juxtaposed and rendered worse as against the official narrative of my work with Matt—often described as decidedly “different” and on the other side of blame. It was a precarious position of difference, one in service to the location of complicity as, vehemently at times, declared to be the school. Matt repeats the same narrative.

Notably, as the official explanatory tale, it is reiterated enthusiastically with nary a change across transcripts and speakers, over the two-year period of our work. All of this occurs even as the family engages me in the same school-style mechanistic game of prioritising sense-given over sense-made. This though the very processes they bemoan, are also the self-same ones they inhabit and re-install at every turn. As such, anxiety reveals itself again as that which cannot be suppressed. It instead moves elsewhere. Indeed, to act, Lacan tells us, “is to operate a transfer of anxiety” (in Baldino & Cabral, 2008, p. 71).

Once a certain amount of anxiety is installed... whatever the student does to deal with the subject matter, to solve the exercises and study for the final exams, all the questions s/he makes in class or privately to the teacher, in one word, his/her

strategy [*techne*, I would emphasise], may be understood as a way of dealing with anxiety. (Baldino & Cabral, 2008, p. 71)

At the level of the cultural collective, so too we see this transfer of Cartesian anxiety. Indeed, repeatedly, existential anxieties of nested components in the system do dialectically work themselves up and down complex emergent forms, narcissistic to and from those Cartesian. And so, echoed in the rising *false* assurance of *techne* over the impossibility of prescribing certain *phronesis*—the transfer of anxiety, like any disease, makes possible its dissipation through and permeation across systems to/from schooled histories in parents and teachers, to/from students, and in the present case, ultimately felt in the threat of my own self-doubt. That I should be certain, as certain as everyone else, and that I cannot find certainty within myself is the well-spring of my humanness, my humility, and my desire, even as it is, in my own debilitating anxiety, the experience of a lack that motivates me and paradoxically that I struggle to hide from humiliating exposure as one “who does not know.”

The greatest challenge for me in my work with Matt, was never the mathematics *per se*, nor any instance or object of fear. Rather, it was always the threat of anxiety trying to shift itself, transferring its affect into effect upon me, and me struggling to acknowledge and love it through to its waning rather than pressing a countertransferring or projecting blame, once again, elsewhere. According to Winnicott, “we have to own our passionate loves and hatreds rather than blame others for creating them within us” (Brown, 2008a, p. 26). This work was my challenge. The effort, I believe, was in holding fast to what Melanie Klein described as the *depressive position*, and resisting the temptation, the allure to visit too long in that earlier attitude of *paranoid-schizoid*

defense. The depressive position describes an ability “to recognise self and others as complex, part good part bad... [and] is essential if we are to see our self as ‘good enough’ for life’s project” (Brown, 2008a, p. 26). I was indeed struggling with my own narcissistic and Cartesian anxieties. I feel myself having emerged more resilient and confident in my uncertainties—less fractured and uni-dimensional in the reclaiming struggle to self. Anxiety proved again, as it has countless times, worthy of the loving.

A minimalist self, denying complicity with a larger perceived wrong, joins forces with others pointing blame. The gesture’s effect is to forcefully deny separation from the pure and certain and, with that denial, to refuse, at bottom, the shame blazoned upon Adam or Eve as infant, originally sinning self, for that dramatic daring, taken in naïve pre-innocence. Herein is the paradox: that, given his state of oneness in the garden, Narcissus would not, could not, admit to needing the apple he so desired.

And so our present condition, at least from a classical/mythical psychoanalytic account, and also described by sociologist Anthony Giddens as a crisis of ontological security,¹⁰⁶ has deep roots in trust and control—begun at birth and yet omnipresent. In some sense it is also a struggle between Winnicott’s given and made (1971/2005).

The given and the made.

Somewhere between the world as given and the world as made is this space of play that seems too contracted in Matt’s understanding of the experience of mathematics as absent any meaningful opportunity at sense-making. To understand how the world

¹⁰⁶ Ontological security is a stable mental state derived from a sense of continuity in regard to the events in one’s life. Giddens (1991) refers to ontological security as a sense of order and continuity in regard to an individual’s experiences. He argues that this is reliant on people’s ability to give meaning to their lives. Meaning is found in experiencing positive and stable emotions, and by avoiding chaos and anxiety (ibid; Elias, 1985). If an event occurs that is not consistent with the meaning of an individual’s life, this will threaten that individual’s ontological security. Ontological security also involves having a positive view of self, the world and the future. (Ontological Security, n.d.)

comes to be given in a mirroring other in a way that allows a space for such play, I indulge the reader's patience, once again, as we revisit infancy and the primal laying down of these experiences into bodily habits of being.

Returning to birth, recall that we can here site beginning participation in a self- and world-making project in the co-shaping of perception and conception. As we have seen, the lantern-like consciousness of the neonate is sensate and sensual experience without perceptual-conceptual organisation (Gopnik, 2007)—except, of course, in as much as instinct and the uterine environment have already pre-conditioned some cortical coordination as precursor to budding conscious attention. Yet, in astoundingly short order, the brain will have developed sophisticated cortical coordination, doing so without conscious intention or any executive governance. Consider vision: At least 33 functionally separate cortical areas are involved in coordinating the visual “sense” made of the myriad, segregated perceptual events that occur when a stimulus strikes the retina (Edelman, 2006, p. 20). Yet, we experience that which we see, of a piece. For the infant, this would not initially be the case.

In the neonate the world of sensory experience (interoceptive and exteroceptive) begins by directing and laying down a precursory organisation of the brain–mind, importantly, doing this coupling, absent conscious awareness of that which it does. It is in such literal enactments of embodying cognition that I speak of doing ourselves into being and knowing. And it is on the principle of entrainment—that neurons that fire together do wire together—that neurally instantiated patterns of association become perceptual categorisation and the rudiments of conception that subsequently guide perception, even

as perception continues to shape conception. We could think of this as the primary dialectic of human singular-plural sense-making.

Consider the infant who hears mother's voice, sees her lips move, experiences her warmth, feels his suckling, and tastes her milk: Not knowing her as anything separate from himself, but rather autopoietically shaping himself to her through these co-experiences within and as self, that infant's brain–mind begins the forming of conception with perception. Eventually, these co-experiences will come to be associated in the symbolic—from gesture to language, primarily verbal, though not limited there—as the child's attention is further prompted, in trust with that first human pedagogue (see Chapter 5 on natural human pedagogy; Csibra & Gergely, 2011). It is posited as no random consequence that, universally in our species, the lettering and utterance of names for rounded soft shapes will mimic movements of mouth when suckling (Fonagy & Target, 2007b, p. 436). Nor is it coincidence that early and primary experiences of body come to be metaphorically construed upon, in sense-making with and of the world (Fonagy & Target, 2007b, pp. 432–439; Lakoff & Johnson, 1999, pp. 45–59).

Too, as the child learns about the world, the child learns of the reliability of things alive and not. The manner in which this plays out comes to be central to identity as an embodied understanding of oneself, in the case of learning, in terms of one's agency and one's preferences for particular, secure-enough, learning environments within which one can safely risk engaging curiosity.

During the first few months, the infant is preoccupied by his developing agency vis-à-vis the 100 percent contingency of his bodily movements to his enacted intentions. However, at four to five months that fascination changes and “the infant *avoids* the kind

of perfect contingencies that reflect body movements, and turns towards less perfectly contingent aspects of his environment (Watson, 1996, 2001)” (Fonagy & Target, 2007a, p. 923). That the infant is drawn to the intrigue of 70% contingency, says too that the disruption of 30% non-self-contingency provokes in alluring ways. ““Self-contingent’ aspects of the world are things that change in response to the infant’s actions, and generate positive feelings by showing that he has an impact on the world” (Fonagy & Target, 2007a, p. 923). There is room for playful curiosity where contingency is reliable but not complete. That is, the child can explore the surprise of pleasing violations of expectations with a trusting adult.

“Mirroring the infant’s displays of emotion is an instinctual response for all adults (Meltzoff & Moore, 1997)” (Fonagy & Target, 2007a, p. 923). In the situation of the good enough mother, the infants contingent-seeking finds delightful reward in the curious presence of a containing other who, holding the infant’s mind in mind, paradoxically invites his difference and with it the play of a “shared consciousness.” From dyad to triad, the parent directs attentions and orchestrates interruptions to the early belief that “if I think it, then it is real—for everyone” (see Chapter 5: From Dyadic to Triadic Relations).

Where the infant experiences deficiencies in mirroring contingency, the possibility of a safe other with whom to learn about self and world becomes to varying degrees compromised. Responsiveness can manifest in a number of non-contingent forms. It can be (a) absent, out-of-synch, or inauthentic, for example, in the depressed parent, (b) contradictory in the volatile parent, or (c) constructing in the controlling one. Under such conditions, contingency-seeking is rewarded intermittently if at all, and

cannot be sufficiently relied upon as a prompt to conceptually sense-make—where sense-making entails resolving ambiguities in mind, these given of perceived incoherences as perturbing violations of expectation in world. The effect could be thought a kind of crazy-making as the child seeks out ways to cognitively, which is to say bodily, manage insufficient coherence in world.

In the case approaching the complete absence of any contingency (positive or negative) in the other, the child knows only solitude with little recourse but to seek reliability in a physical (non-human) world and the security of his own pretense to manage unto the unresponsive human one. Where contingency is not trustworthy and the parent is at times experienced as a threat, the child is pressed to hypervigilance and despair. Finally, where the other's face consistently overrides the child's experience, superimposing instead a constructed real as façade, then the child is pressed to become the façade assigned him; that is, to disregard self and assume the identity given in order to be thus recognised.

On the other hand, a highly attentive and preoccupied parent can err in the direction of over-accurate responsivity. Where the parent's mirroring is too well matched to the infant—that is, where the parent does not contain the child's affect in a marked way—then that failure effectuates a loss of the potential to down-regulate affect. In such acts, the child is bereft of the interruptive teaching encounter out of which audience and a self can be present.

Of interest are the five coping styles of infants that have been associated with different forms of maternal depression (recounted in Lackmann, 2008, pp. 119–120). In some shape or form all of these styles express infant solutions across a continuum (and/or

an oscillation) between the safety of *pretence* and the frightful, but somehow comforting, release into *psychic equivalence*. In the case of pretence, the child can find or otherwise create a sense of mastery with world by relying on the self to charm or cajole another into responsiveness and/or turning to more reliable inanimate objects and life forms (pets) for greater contingency and a sense of efficacy in world. In the case of psychic equivalence, the child matches self to the erratic other, riding the waves of affect in fusion with that other. These describe, in crude ways, the makings of insecurity, between the given and the made, in attachment and misattunement.

Fonagy and Target describe the shared states of consciousness that arise between primary caretaker and infant:

The successful process of elaboration of shared meanings between individuals leads to a dyadic state of consciousness” rarely seen in maturity, but “there is accumulating evidence that dyadic interaction of this kind contributes to the achievement of normal brain organisation. When infants cannot create such dyadic states the coherence and complexity of their self-representation is dissipated. (Fonagy & Target, 2007b, p. 921)

Phenomenologically, not causally, the absence of such a state is an aspect of severe depression where such depression recreates the infantile loss of contact with the external world of subjectivities. An absence of underlying experience of shared consciousness renders the world “flat, meaningless, and isolating” (Fonagy & Target, 2007, p. 921).

Human infants learn by imitation, but unlike other species, we imitate according to inferred intent (p. 925). Fourteen-month-old babies filter their observations of human acts through a model of mind that assumes purpose. Babies learn about the world through

acts observed and taken on that world. As such the dyadic relationship becomes triadic in the pedagogical sense of reality coming into view through the other. Notably, this pedagogical moment, onto world, teaches about the physical world without bearing on the experiencing other. Put differently, “the infant finds the physical object through the subjectivity of the psychological object” (p. 926). In other words, if a parent expresses delight when tasting baby food, the child attributes the food with the fixed quality of delightfulness independent of any person. That is, the 14 month-old assumes the character of said object as universally known. Again, this has bearing on the supposed “given” neutrality of mathematics as being at the same time anxiety provoking.

The *curse of knowledge bias*—that, if one knows something about the world one tends to assume that everyone else knows it too—accounts for Piaget’s egocentrism, which turns out to be a misnomer:

It is not the overvaluing of private knowledge but the undifferentiated experience of shared knowledge that hinders perspective-taking.... We assume that everyone has the same knowledge that we do, because most of our beliefs about the world were someone else’s before we made them our own. (Fonagy & Target, 2007, p. 922)

To reiterate, then, our first attachment figure, usually mother, is first other, though she does not begin for us as such. Instead, she *is* us and we are one, swaddled in coextensive psychic being with her in a boundless universe. Though the infant has “the capacity to distinguish self from other from the earliest days of life.... [there remain tendencies] to experience ‘symbiotic’ moments of fantasised fusion between *self-*

representation and object representation [emphasis added]” (Kernberg & Caligor, 2005, p. 125).

Young children do not yet know fully that their internal world is private and individual. This developmental configuration shapes unconscious fantasy and primes desire for ‘oneness’ and ‘merger’. They do not know that they can choose whether—for example—to share their thoughts and feelings with their parents, or their therapist [or their teacher I would add]. (Fonagy & Target, 2007, p. 922)

Toddlers, so prone to outbursts of rage and frustration, evidence a world not clearly demarcated as separate from self. In a logic, born especially of the experience of adults who appear to know all, the child reasons: “Surely these Others should know what I am thinking and feeling. Surely they must see the world as I do and their failure to act accordingly expresses a willful obtuse or malignant intention on their part.” Fonagy and Target believe that “the solipsism and lack of openness to new knowledge of the narcissistic stance may be rooted in this kind of behavior” (2007, p. 924). That is, where the child turns literally and metaphorically away from the other and toward the self as adaptive solution to the trauma of inadequacies of contingency and markedness in the responsiveness of the primary other.

We presume that the relational experiences associated with disorganised attachment, frightening parenting, helplessness, misattuned affect, dissociative episodes on the part of the caregiver, predispose the infant to a desire to find only what he or she *expects to* find (Lyons-Ruth et al., 1999; Hesse and Main, 2000; Main, 1997). Triggered perhaps by the loss of the shared external, the vulnerable

infant is forced to find contingency from within. (Fonagy & Target, 2007, pp. 924–925).

Thus, it is that from these variously developed rudimentary precursors of identity formation through self-other-experiences, especially in early attachment relationships, we begin a lifetime journey in the difficult negotiation of human individuation with and in a shared, co-created, given and made world. In some deep place, it is as if we struggle with undeniable appreciation “that without the specificity of... [our] individuality,... [we have] nothing original to say and, moreover, there is no one present to speak to anyway” (Pinar, 2009, p. 12). Whether aided or deterred, especially by that first attachment figure, our becoming is a solitary struggle, while attempts by others to save us or to do the work for us, ultimately foreclose that becoming. The human life is a journey, begun at birth, in self-determination and self-formation within paradoxes of separate and bound selfhoods—each self feeling itself but for whom the sense and permissible depth of that feeling takes meaning from a world given to the self (as pedagogically encountered with a first caretaking other) and bestowed as a possible upon that self.

In a quandary of the given and the made, naissante “being” entails not only an ontological sense of omnipotence but also a vulnerably co-existing epistemological void (not unlike that mythically described as Eden). Mother begins for us as part of infinite formless being, like a dream that knows not its beginning. Our need produces the breast—object of our making. Yet, and as it too-quickly turns out, the breast and mother fail to accede to our unformulated but viscerally felt wishes. We protest. The attuned mother acknowledges our angry protests, attends to need in quick enough measure, *and* returns a contained, disarming acknowledgement of the self that thus needs. In the mirror,

playful, non-threatening mimicked anger or otherwise acknowledging act, marked as pretend but real, disarms alarm while at once accepting our subjectivity and confronting us with mother's difference. This same narrative plays out literally and metaphorically across subsequent attachment relationships, as older child with parent, student with teacher, and partner to partner (see, e.g., in Levine & Heller, 2010). In predictable responsiveness the good enough mother (parent, teacher, and partner) leaves and returns (both physically and psychically) in sufficiently foreseeable measure to give back a negotiable world and the ongoing admission of a good-enough, body-mind self to stave off narcissistic and Cartesian anxieties at any debilitating extreme.

That first mother figure, when thus good-enough, receives our object-making insistences on her construction and, out of them, refashions and returns herself as subject in an affirming-enough world. Crucial is that the mirroring be marked as her difference, announcing her presence, and thus both interrupting unhealthy narcissistic development while giving audience to support budding identity. Her manner of being at once with, not with, and alongside affords admission to a less-than-perfect-self in a less-than-perfect-world, but a world able to give something back about itself—something to be learned from, without fear of not being counted worthy, or worse: not being counted. Yet, we cannot deny here the beginning of that primal separation—the terrible never-fully-resolved first loss—that itself creates the possibility of humanity's Being as “world-making.”¹⁰⁷ The mother, lost to us as omnipotent extension of self, by way of her attuned separateness breathes the opportunity for our own epistemological self-trust in terms of

¹⁰⁷ Here I invoke also Agamben's discussions, from Heidegger, of man as “world-forming” as against the animal as “poor in the world”, 2002/2004, p. 51.

both the inner and outer boundaries of us and our capacity to act as arbiter of what we might dare to tap, in trust, within ourselves and in the world.

In sum, the infant's world as diffusely infant-made meeting with disruptive worldly disillusioning of phantasmic and fearful omnipotence, renders a world as given and a self as limited in its "acceptability." Together the accepted self, the inner-self projected outward, and the world thusly "taken"-as-seemingly-given dynamically condition both a primitive unquestioning, "natural attitude" (Heidegger's "the they," see Stolorow, 2009) and the ground for a more mature, curious, and imaginative phenomenological one (*epoché*; see also Thompson, 2007, pp. 17-22). The phenomenological attitude works mindful¹⁰⁸ attention to the ontology of lived experience while striving to develop an awareness of awareness that is the essence of Dasein's mentalising¹⁰⁹ possibility.

Not coincidentally, we discern two circulating perspectives at the level of the collective: The world remaining as wholly made, from the view of the radical constructivist, and the world as given in the purview of the "naïve" positivist (see Campbell, 2002). The enactivist travels a middle way that envisions world and observer as co-emergent, given and made, dialectically so. Varela describes it well: "In the

¹⁰⁸ Wallin (2007) brings eastern mindfulness traditions to bear on Daniel Stern's work in *The Present Moment*. He describes a mindful stance as "deliberate nonjudgmental attention to [internal and external] experience in the present moment... [that is] in some sense, 'deeper' and closer to the subjective center of ourselves" (pp. 4-5).

¹⁰⁹ Mentalisation theory arises out of Fonagy's work in attachment patterns (in Donnel Stern, 2010, pp. 164-167; also Wallin, 2007, pp. 4 & 133-166). Mentalisation entails the ability to "treat experience, especially the experience of affects and intentions, as symbolic representations, not as concrete or literal copies of the world. A symbolic representation is understood to be a subjective rendering, and therefore open to modification" (Donnel Stern, p. 166). Through mentalisation, "experience can be negotiated" (p. 166). It is not understood as a "direct avenue to the truth that can be modified only by lies or distortion" (p. 166). Notably, the capacity to mentalise, developed early in life, distinguishes those few individuals who manage to "be well" despite histories of marked early childhood trauma that otherwise characterise insecure attachment patterns and pronounced psychic pathologies in later life (Wallin, 2007).

enactive approach reality is not a given: it is perceiver-dependent, not because the perceiver ‘constructs’ it as he or she pleases, but because what *counts* as relevant world is inseparable from the structure of the perceiver” (1992/1999, p. 13).

Thus in some sense conceding that all *is* relative—“in deed” and “in fact” (both terms etymologically connected, not to anything “real,” but rather to doing)—we strap our relativities together to find “fitting” enough places in which to connect, to cohere adaptively, and compassionately, as we can. We are long past Eden. And yet the apple, that held promise but gave exile, (also symbolic gift for teacher, the disillusioner, see Milner, 1956/1987, p. 188) neither betrayed us nor could we have refused it. The shame of our nakedness and the exile given by the father, ushered us out of a false oneness in a garden of Eden’s illusion. Here, in the world, *thrown* as we are, we find opportunity to experience the ebb and flow of life’s striving after itself in autopoietic rhythms of tension and vigorously felt resolutions that mark the fecundity and potency of individual and collective being and becoming.

The point of considering narcissistic and Cartesian anxieties as working together to press minimalist retreats into self-enclaves is the point of understanding a common challenge in living well this conditioning condition of *being with*, of Dasein and Mitsein both and together. These issues ultimately reside at the center of an educational challenge, of people helping people grow and become, in good-enough ways—that through effortful study, courageously-lived intention, and grace given inward that it might be given outward, we might engage meaningful presences of selves-with/in-world. And finally, the point is that, from birth, we wanted for another’s face, an attendant presence—to be present enough to give audience to our presence through and with a

present world. The co-present face, that thus gives audience, listens and bears witness in contingent, marked, and containing-enough mirroring.

In immediate small theatres of being-with, worldly scripts are entered into, mused over, and played at in ways to foster self-trust and prompt self-daring into and as authentically curious selves. Bathed in such amniotic-like protective but admitting structures, openings are given and taken up, risks are engaged, mishaps are recovered through and learned from, and the recursive making of coherent-enough sense engenders wellness-opportunities of self- and other-trust in a sufficiently trustworthy world. As such, individuals as collectives-in-collectives have greater opportunity to come into their ownmost robust resilience, enjoying Promethean and Dionysian¹¹⁰ rhythmic movements of adaptive enaction—the potent and the fecund.

The Illusive Sense in Nonsense: Toward Adaptive Virtual Reals

The sense in nonsense (1956/1987a) was a paper presented by Milner to the educational magazine *The New Era* in 1956. Milner, a Freudian, submitted her work, alongside a Jungian and an Adlerian—all responding to the invitation to speak to what

¹¹⁰ The Greek Titan Prometheus, champion of humanity, defied Zeus and gave humans fire. He represents human striving, the quest for scientific knowledge, and the risk of unintended consequences of our technological prowess—he himself sentenced to eternal torment at the hands of a wrathful Zeus. I associate will power, potency, and human agentive (purposeful) action with Prometheus and more broadly with the ordering of forms that is the cosmos and the ordering of time as chronos.

Dionysus, on the other hand, was by various accounts a playful Greek god or demi-god associated with the grape harvest, the fig tree, fennel and the idea of ecstasy and epiphanies. I associate him with messy disassembling work of fecund play as essential precursor to creative sense-making (or the pleasurable assemblages of a new and intriguing resolution of ambiguity). For me, there is an affinity between the fermenting chaos of an unordered universe and *kairos* that qualitative Greek notion of timeliness and moments over-ripe with possibility.

I conceive the flux of life as between chaos and cosmos, fecundity and potency, Dionysus and Prometheus—a spontaneous rhythm wherein chaotic Dionysian fecundity repeatedly spawns outbursts of cosmic Promethean potency: creations' birthings destined to expire back into the chaotic void.

I believe we have overdrawn our account in potency and are emerging out of potency's era into a time where fecundity must have its day. I expect very "messy" times ahead!

their particular perspective might offer teaching. For Milner, Blake's series of engravings, *Illustrations to the Book of Job*, seemed to be dealing with the same kinds of concerns about human creative possibility as she had been encountering in her study of education. She saw Blake's rendering of a story—one addressing the righteous man's suffering at the hand of God—as an accessible way into a psychoanalytic conversation about a struggle that we all face. That story has at its core a question of self-deception inhering in the righteousness of a reasoned, pure, unfettered, pious adherence to godly precepts—in the view through Descartes, of rationality. It is a position meant to keep creatively-moving, potentially calamitous bodily affect, with all its chaotic irrationality, at bay. She tells that “both the struggle against having to give up one's infantile feelings of omnipotence and the battle for spontaneity of the instincts is felt, at least in a patriarchal society, as a fight against the father” (p. 187). Allegiance with the father renovates lost omnipotence given of a disillusioning world. Yet there is a price to be paid: the sacrifice of creative potential at an altar of certainty.

Taking a wider reading of Freud, Milner develops a battleground “between nature inside man, his instinctive desires, and nature outside him, the objective facts to which he is compelled to adjust if he is to stay alive” (p. 187). From a positivist, empirical position, nature outside *is* the world and truth exists out there as given and therefore discoverable through right method. It is also out there in the spirit world and accessible to a self able to transcend, quiet, or otherwise deny troublesome, unconscious noise within. Milner develops this singular battle to a plural challenge when she writes that humankind as “social animal has, to a large extent, substituted the compulsion of society for the compulsion of nature” (pp. 187–188); that is, it is society that presses adherence to a

rationally-ordered external world. In such conflicts, within which we all wrestle, our instinctive needs—the unordered, unintegrated sorts—are experienced as “themselves disruptive of that very external stability which they need if they are to be satisfied” (p. 188).

Thus, in contexts relevant for education, Milner considers the difficulty of attending to, whilst not being overwhelmed by, creative possibility, as inherent “sense” in the unconscious’s seeming “nonsense.” In effect, she uses the language of the Bible and Blake’s *Job* to bring psychoanalytic thinking into dialogue with teaching as interrupting the omnipotent and omniscience promise at root in Cartesian foundationalism (pp. 168–169). She writes,

In order to learn at all the child also has to climb down from the original heights of omnipotence, to discover how little he knows, where once he felt he knew everything, how little he can do, where once he felt he could do everything. However skilfully [sic] this process of disillusion is accomplished it seems there is always pain in it—for the child—and somewhere, however hidden, some degree of hate. Thus it is that good teachers understand (intuitively, if not explicitly [sic]), that their task is to help the children with their hate, help them to accept it, recognise it, not shut it away so that it becomes a hidden Satan; which means that the teachers have come to terms with their own hate, so that although disillusioners, they are also merciful (p. 188)

I believe this passage underscores both source and “solution” to Cartesian, Narcissistic, and mathematics anxiety. Milner enjoins the all-important work of coming to terms with hate, self-hate and other-hate, such that we might live well in a *given* disillusioning world

while still not letting go of our capacity to create illusions, those *made* substances of our lived condition. She advocates learning to live with and in these illusions, these virtual realities (see Maturana & Verden-Zöllner on Reality,¹¹¹ 2008, pp. 209–213), despite disconcerting awareness that they are just that: flighty and illusive interpretations—hermeneutic in a sense, and apt to need adjusting “on the fly.” The provocative invitation is to accept these collectively- and individually-created, adaptive, virtually assumed reals as sufficiently fitted with world and to do so while honouring the always non-virtual realities of our lived psychic experiences in that world.

I want to point out the ways that Bernstein’s analysis of Cartesian foundationalism and Cartesian anxiety echoes with the sensibilities of Milner’s psychoanalytic treatment of the human creative challenge. It seems they both draw from, and grapple with ways to interrupt, a common stock of cultural narratives—these spawned out of the play of Cartesian and narcissistic anxieties.

On the one hand, Milner’s analysis goes to the psyche. Following Winnicott, she advocates for the centrality of safe spaces (holding environments) for coming into self and for healing old hurts—spaces, unexpectant and undemanding, that leave room and possibility for attending to and contending with that which expects and demands from within. In this way the wisdom of the unorganised, non-rational elements of self—the “sense in nonsense” as she puts it—finds its own timely emergence.

¹¹¹ Maturana and Verden-Zöllner’s writing expresses the deep implications of enactivist perspectives. I cite them at length:

Nothing that we live is trivial, regardless of whether we are conscious or not of what we are living. Nor are we always aware of what we live at any instant—even if we know that we are living an illusion; what happens depends on how we live what we live in our unconscious existence. Our conscious and unconscious psychic living is never virtual. (2009, p. 212)

On the other hand, Bernstein advocates *the solution to Cartesian foundationalism and anxiety in renewed dedication to dialogical communal being*. In this, he finds hope and direction in Hegel's paradox of the modern age: "that the coming into being of community already presupposes an experienced sense of community" (2008, p. 226). Echoing the subtexts of Gadamer, Habermas, Rorty, and Arendt, Bernstein writes, "Each of these thinkers points, in different ways, to the conclusion that the shared understandings and experience, intersubjective practices, sense of affinity, solidarity, and those tacit affective ties that bind individuals together into a community must already exist" (p. 226).

Thus, to the question, "What, then, is to be done in a situation in which there is a breakdown of such communities, and where the very conditions of social life have the consequences of furthering such a breakdown?" Bernstein responds by embracing an evolving hermeneutic tradition enacted in dialogical communal being, where incommensurability does not mean that the boxes cannot speak to each other—indeed where, specifically, science and technology are not diametrically opposite the humanities (pp. 167–169, especially in reference to Gadamer¹¹²); where we accept that *phronesis*, practical discourse, and judgment are understandably autonomous and fragile (p. 230); and where the motivation to exorcise the Cartesian Anxiety as a "practical-moral concern" (p. 230) evidences a *telos* deeply rooted in our human project (p. 231). He calls for us to draw on this *telos* and collectively invest ourselves in "the practical task of

¹¹² Of Gadamer, Bernstein (1983) writes, he often seems to suggest that Method (and science) is never sufficient to reveal Truth. Given the strong claims that Gadamer makes about the universality of hermeneutics, there is something misleading about this contrast. For if understanding underlies all human inquiry and knowledge, then what Gadamer labels Method must itself be hermeneutical. The appropriate contrast would then be not between Truth and Method but between different types or dimensions of hermeneutical practice. (p. 168)

furthering the type of solidarity, participation, and mutual recognition that is founded in dialogical communities” (2008, p. 231).

Yet, in advancing a "cure" for Cartesian anxiety in such renewed dedication to dialogical being, Bernstein falls short of addressing just how we are to approach this utopia. Indeed, he develops his perspective in a voice that joins other astute minds (Gadamer, Habermas, Rorty, and Arendt) pointing us in the same direction, and they do so while bearing vocal witness to a world's apparent spiraling away from these very dialogical ideals. Indeed, in Bernstein's hands, it is not clear if the fundamental problem is Cartesian anxiety or a lack of ability to converse across difference. In any case, these thinkers do not, it seems to me, address the problem of community and Cartesian anxiety and its conditioning, full on. Nor does it appear that they go beyond recommendations into possible means. I suppose that is to be expected. Neither have they been privy to the paradigmatic difference made possible by their very work.

It is not difficult to elide from wishing, to witnessing and bemoaning the absence of that which we cannot see, and then blaming. We see the world according to the ways in which we know to look. As before, a disturbing rhetoric of "they" seems to resonate still through present educational discourses. That habit of blaming one part of society, mainly some offspring of scientific management, finds uncanny legitimacy and conviction in the kinds of thinking advanced by philosophical thinkers. The popular lamenting discourses settle most often into narratives around trust and control. Ironically, the most disturbing element of these discourses may well consist in their repeated failure to disturb, much less dislodge, the persistent motivating anxieties—all of which seems to

suggest a grand playing out, in *polis* as in the personal,¹¹³ of Freudian enactments of dissociation, repression, and projection, to name a few. We seem to be avoiding the root challenges in which we are all complicit by virtue of our very humanness.

Ultimately I take the essence of core concerns to be universal ones of epistemological and ontological import, especially in terms of self- and other-trust as viable being.¹¹⁴ In the same way that knowing is being is doing, epistemological questions of how we might know are but expressions of ontological issues of existence. We come into our being through the doing of ourselves into embodied knowing. Descartes cannot carry the weight of the blame for the condition of modernity. Nor does it move us any closer to resolution to admonish our very human struggle with the fundamental paradox of our singular plural being. There are human reasons, individually and collectively, pressing us to particular ways of being and into these particular anxieties. We might do well to look more closely while reading across discourses.

Accordingly, I offer that, in psychoanalytic theory, especially, there is room to investigate farther than Bernstein (and deeper than Lasch, for that matter), on the shoulders of giants as it were, in ways that get at the human roots of present challenges—

¹¹³ In this I agree with Arendt for whom, according to Bernstein, “opinions... are the very stuff of politics” (p. 215).

¹¹⁴ Richard Foley (2001) develops an argument that epistemological self-trust radiates outward. Yet he does not explore the cultivation within the self of such trust. Here the work of developmental research is informative for the interplay of infant and adult with world, especially in the first year of life, wherein the child learns degrees of self-trust in adaptive response with a good enough attuned caregiver. The problem of epistemological trust begins with the infant’s response to that first pedagogue’s lessons about a dependable, trustable enough world—the pedagogue who occasions an locally apt answer to the question, Who shall I trust to know? Ultimately, a problem of self-trust becomes an ontological problem when it turns to the psychic questions of “How do I know my existence, yours, and ours?” It is also a problem addressed within a framework of recursive self-cause of coexisting and nested selves. It is answered through the hermeneutic stories we learn to tell ourselves and which in return condition the selves we allow ourselves to become. And it is a difficult one given our human condition of straddling, at once, two domains of existence—both singular and plural.

deep biological, systemic, and evolutionary roots. Bernstein did not have privy to the last 30 years of collective multidisciplinary and mutually reinforcing study and research on the human condition. It is no longer enough to say the equivalent of “We must try harder to get along, to play nicely, to listen well and openly. And that there is hope in the leaning into our *telos* to do so.” There is already a discourse, however fraught, in the more empirical human sciences supporting the claim to our inherent altruistic, communal, and caring tendencies. Yes, the point is clear: We are a social species! Now why are we having such difficulty enacting our sociality well in all the worldly magnitude confronting us? To this question, I suggest that we are in a present moment of human possibility (perhaps in keeping with Arendt’s notion of natality)—emergence at the confluence of the humanities and, at least in some circles, a now humbler, more mature science, cognisant of itself as under the umbrella of a larger hermeneutic tradition of human being—where we can begin to understand ourselves and the deep life forces pressing this persistent troubling resistance to what might be.

To put it bluntly, it is not that we—some or all of us—have been “bad,” nor even that we have been “foolish.” There is no absolute measure, no threshold against which to call us in error as such—except the ones we construe. It seems that we are ever so reluctant to admit and live within the constraints of our biological evolutionary limits—to admit to ourselves that we are no more and no less animal, albeit animal rich in the world and in communal possibility. The unabated aspiration to omnipotence and omniscience seems everywhere alive and well.

At bottom, we seem loath to accept that, at the level of individual bodies, evolved to the emergent homo sapiens that we are, ours is an adaptive being construed in world

and with world in congruence to an older, much different biosphere than the one we presently inhabit. We have no choice but to work within the constraints of what is individually, humanly, and biologically possible. Most notably, we face within-species differences and inevitable partialities that make difficult the realisation of this wonderful notion of the dialogical, leastwise in the context of everyday conversations across difference where it all begins. Indeed, is it not the case that when we converse, we do so across similarities, else what is there in common as connecting ground for conversing? How do we live community despite pressing partiality in both its meanings?

In regards partiality, note that, on the one hand, we live in and with the impossibility of impartiality of perspective: Ours will always be a view made by and from a self that is never fully available to itself—to knowing that which it knows and enacts: Most of what constitutes us—the *moving* self (moving because it moves us in being while it shifts within)—is largely cloaked from the consciously-accessible parts that are seemingly making all the decisions. And this is the case even though conscious decisions occur, in large part, in blind abeyance to unconscious and nonconscious dictates.

Also note that, on the other hand, our partiality is the condition of the singular-plural paradox of selfhood that sets up a struggle that is hardly grasped nor inhabited with any modicum of ease. We are part of a larger whole and so have only limited and partial access and complicity in the shaping of that whole. At the same time, we are construed of the historical and spatial breadth of this larger sum of the parts; that is, the larger unity is and continues to be the possibility of our becoming. In the sense described by Nancy

when he says that people are strange (2000, pp. 5–10) we share originarity with those around us.

So, while I agree that a promise of human betterment inheres in lived dialogical community, as Bernstein advances, I want to work on the difficulty of how to get to that. At the level of *singular being* evolution is slow. We cannot adapt our singular biological selves with any swiftness comparable to the worldly collective that is presently emerging. At the same time, as languaging, social, collective unities, we have evolved in plurality (and number) at a pace much more commensurable to present planetary conditions, however challenging we understand them to be. What's more, even though the unwieldy power of technological advances have brought us closer to a teetering point, they have also shifted the means and pace by which we might enact a shared mindful potential.

If all this is the case, then it would seem a truism that we must address present concerns from the wisdom of community. But—and this is a significant but—the collective cannot outstrip the individual, nor can any individual or group of individuals effectively outstrip the collective. In these gestures we fracture. The challenge of too much difference to hold together and not enough to press adaptive change in shifting singular plural trajectories—individual and collective together—is core human concern. And so I am heartened when science, technology, and the humanities turn together to look inward and ponder deeply this singular-plural autopoietic being that we shape and that shapes us.

To reiterate, while I do likewise agree with Bernstein's expressed high ideals of community, I envision them approached differently than perhaps was his imagining. I have always thought social politics as the play of the *polis* of self. In this particular

moment in time, it is the *polis* of self that is ripe for attention. Accordingly, I conceive the most fecund leverage point of our time to inhere in education for individual wellness.

Fonagy and Target write,

Bowlby, in all probability, underestimated the importance of attachment for human development. It is not just the foundation of later social relationships, but also the primary path to discovering those who will be trustworthy informants about the nature of the world, and thus to the world itself. (2007, p. 925)

It strikes me, repeatedly and everywhere, that the block to dialogical communal being resides in unresolved, deep, early traumas and blindly stumbling into the way we will live and understand our singular plural being. This is simply no longer good enough. We can indeed know better.

We exist at a paradigmatic tipping point of change and that change, I believe, will be initiated, if it happens at all, in the form of educating ourselves into graciously inhabiting being as singular plurality. This is decidedly *not* an exercise of trying harder or of more dedicated effort. Rather it is an exercise in trying differently such that in courage we learn to face what we hate most in ourselves and in doing so, slowly, dialectically so, finding ways of putting wisdom-minds dialogically together to think differently and across gaps, resolving the troubling ambiguities therein. In such humble gestures, and they do start humbly, gaps diminish in fright value and become the rich repositories of possibility that they can be¹¹⁵. We would do well, presently, to grow our understanding of ourselves, especially in education, that we might thus work with and in the evolved, inherited wisdoms that have conditioned our continued being and proliferation on the

¹¹⁵ The goal is not the removal of gaps. We do need the perturbing insistence of difference to move us and we need the undefined chaotic spaces out of which creativity emerges.

planet—that is, grappling with and from the autopoietic qualities of our bodily and collective selves.

These days, we need not look far for clues to think ways to otherwise. Cartesian anxiety presents notable consistencies with narcissistic anxiety in the same way that Cartesian foundationalism is consistent with Narcissus's view of the world. In turn, both echo the infant's view of self in world and this strikes me as no small coincidence. That early illusionary worldview (if we can call it a worldview, given of course that we begin without conception of world), historically in the collective as the individual, waxes and wanes in conversation with an interruptive, corrective disillusioning “out there” pressing adaptation. The fallibilities of earlier illusions, revealed in looking backwards, if seen as failures of rightness, repeat the painful loss of false omnipotence and omniscience that renders acute again an old anxiety (at levels cultural and individual) that we all originally pass through and to varying degrees continue to inhabit. It is an anxiety that lingers in our deepest, most primal selves and it fundamentally owes to the strength of unresolved insecurities that keep us believing in and hoping for the return to blissful union, with body-nurturing mother earth under the protective gaze of all-knowing father, in an Eden-like paradise. These stories resonating within selves are at fundamental odds with a lived experience of autopoietic grappling in a world of good enough, where perfection regularly eludes us—a world absent that mythical possibility and that offers instead only the humble and potentially disconcerting paradox of singular plurality. If dialogical being evidences a means to live well this paradox, and I believe it does, then a practical discourse might begin out of the study of a natural pedagogy that enables infant, child, and ultimately adult—sometimes at least (consider from whence the *telos* to solidarity

and community arises)—to live securely, unpretentiously, and assertively, with degrees of appropriate self-trust¹¹⁶, in the unavoidable thrownness, however gradually-mitigated into awareness, of singular-plural existence.

¹¹⁶ A beginning elaboration of the meaning of appropriate self-trust would involve valuing appropriately and learning fearlessly from and with other understandings—historically, spatially, and temporally different—taken hermeneutically so, as might be understood as given by various and myriad sources, for example, authoritarian, cultural, and traditional; other and our own.

7 Demanding Performances

I begin this section on demanding performances in consideration of the anxious effects of such demands felt, as imposed, upon learners who struggle under its weight.

One need only to look at the results of a 2011 survey of 1,600 University of Alberta students to know something is very wrong. About 51 per cent reported that, within the past 12 months, they'd "felt things were hopeless." Over half felt "overwhelming anxiety." A shocking seven per cent admitted they'd "seriously considered suicide," and about one per cent had attempted it. These problems aren't unique to U of A.... Overprotective parents may think they're helping their kids, but once these kids arrive on campus, small problems can seem overwhelming. (Lunau, 2012, p. 64)

Juxtapose the above troubling educational context with the value of failure as narrated recently by Michael Enright on CBC Radio. His essay begins by emphasising education as "about educating the whole person, not just for a job but for active participation in our democracy" and then describes his experience in reference to three teachers, women, who "left a deep mark... in an otherwise undistinguished elementary school career" (September 6, 2012).

The stuff of learning... were important. But the greater lesson was the idea of learning to learn, the act of learning itself. They also managed to convey through the miasma of math and memory work the sense that we were part of a larger undertaking. We were in the process of getting an education. What that meant, we couldn't explain in any great detail at the time. But we knew it was something important.... Some of us, those good women taught, would fail—but that was all

right. Failure was not something to be ashamed of. The only failure that mattered was in not trying. The cliché was that we could learn almost as much from our failures as from our successes. As we discovered in later years, the cliché was true. In my case, refreshingly so.... My failure was in a very real way liberating. I had discovered something I was no good at and I could relax and put the dream away. I am not suggesting that failure should suddenly become part of school curricula. It's simply that as parents we should relax and realise that failing is an ever-present part of learning what it is to be educated. (Enright, 2012)

Without the possibility of no, yes is rendered meaningless. Without the opportunity for failure, success is vacuous. The anxious student seems riddled by this construction.

For me, the hardest thing about giving audience, especially in educational contexts, has been and continues to be the challenge of defusing the transfer of anxiety. Just as the parent has to survive the child's anger for the child to be well, so too must the teacher, school, and education survive various publics' and students' transfers of anxiety—doing so whilst listening mindfully to underlying concerns. A refrain in me, that I read in a teacherly book many years ago, has helped: Sidestep the struggle for power. And the manner in which I came to understand and enact this aphorism was in a constant return to the target of desire as through the discipline, in the present case, mathematics. The point was never to win, and if saving face on the part of the student allowed her to move into revitalised learning spaces, then yes, because being well with, through, and because of learning was always the point. Where parents and students were inclined to lay blame, to externalise, I sought and in many instances found ways to preemptively

disarm such acts, unobtrusively so, in manner to support and accept them, and myself, in enabling the courage to inhabit each our own agency. In retrospect, I believe that I worked to give audience to their becoming selves, that their anxiety be defused. To effectuate this I had to also grant audience to my own becoming. Recognising the transfer of anxiety, mentalising upon and with it, somehow has enabled me, I believe, to move further in a direction of mindfulness that increasingly assuages, sometimes liberates me, from my own insecurities. Would that all students could come to a place of trust, if not elsewhere then perhaps especially with a pedagogue who might open or otherwise renovate a possibility of belief in the creative, non-linear, sense-making wisdom of selfhood as life—leastwise enough to risk effortful learning in that which is deliciously demanding.

Turn with me now to two middle stories taken from my work with Matt. Both were narrated in March of 2011, in the middle of my reflective work, though temporally toward the end of our two years. I include them here so that the reader can hear and bear witness to the shifts. Note the ways that the demand to perform moves from impossible-to-fulfill preemptive ones to something of ownership in the play of self into and with mathematics as inviting and intriguing provocateur.

In this manner, bringing the situating of the previous chapter on anxieties into and through the story of Matt, this chapter returns us to the question of mathematics.

Middle Readings: Reporting on a Continuing Story (March, 2011)

Matt's area of expertise remains his quiet, disarming, outward demeanour. It used to hang on him loosely, casually, nonchalantly, in the same way that his clothing draped him and he hid underneath oversized, layered T-shirts strategically covering low-rise

pants that seemed to defy gravity and ironically both defied and embraced conformity. I think he stands a little taller now, and his hair is shorter so that he seems to take (or is it need) less comfort from hiding behind it.

I recall observing him at hockey tryouts in the fall—me sitting on the bleachers alongside his parents—and me feeling their pervasive embarrassment at the marked difference between their son’s ability and the other players. He did have, owing in part to his size, a “wicked” slap shot. I wondered about their previously expressed approval at Matt’s initiative in electing to try out.

By December 2010, despite an everywhere-evidenced, increased ease in the spaces of our work together and with the mathematics, I remember how to my continued bewilderment, Matt’s habits of manifest anxiety, stubbornly persisted—apparently wildly undisturbed, outside the relative haven of our tutoring sessions. That is, outside our fledgling “holding environment” (Milner, 1972/1987b, p. 248)—outside the safe theatre afforded by my containing capacity¹¹⁷—as before, the world’s echoes silently raged inward. The faceless face of an unformulated, ever-present, judging Other continued to reign debilitating angst on homework and test questions. Tony Brown, reiterating Baldino and Cabral, says, “What produces anguish is not failure itself, but the perspective of failure, that is, the possibility of consummating failure in the eyes of the others” (2008a,

¹¹⁷ Describing Winnicott’s squiggle game, Milner says, he used these games to structure the therapeutic consultations. Each account... exemplifies... his beautiful concept of potential space... he defines... as ‘what happens between two people when there is trust and reliability’. Thus there is also the way the account of each session organises time. Time stretches back not only through the child’s lifetime, but also through Winnicott’s own years of psychoanalytic practice, so that he has at his fingertips the tools of psychoanalytic concepts, though using them here in a different setting. (Milner, 1972/1987b, p. 248)

For me, our tutoring sessions enact something of what Milner was describing. We were playing the mathematics game, not the squiggle game. The remaining elements seem to apply here, as much in this impossible profession, as in psychoanalysis.

p. 11). Thus, under continued threat of failure as a person, made poignant through mathematics, a frustrating disconnect continued between what Matt seemed to understand and could demonstrate, mathematically unassisted, in my presence, and what he would/could enact when forced more explicitly to the will of the Other in exercises and exams outside that presence. On December 15, 2010, after having failed the first and second of the course tests, and reportedly describing these as drastically different from the work he'd been doing, his mother and I went to the testing centre to peruse the test and to share Matt's struggles with the district's assigned grader-tutor.

That gesture of communication made space for some humanising of this projective cyborg-making experience. It did so by challenging several debilitating assumptions: (a) on Matt's part, that the grader-tutor could not be of help—instead Matt found him extremely personable, encouraging, and accessible; (b) on the tutor's part, that Matt knew very little, was simply not putting in the effort, and that his high scores on assignments were because his tutor was essentially holding his hand through them (with the interesting corollary that any errors there owed to the tutor's lack of understanding); (c) on Matt's mom's part, that the test was, as Matt had reported, somehow foreign to what Matt had been studying and the “system” was, in that way, to blame; and (d) on my part, in regards the effect of anxiety: Under the watchful scrutiny of both mother and district tutor, my own thinking ability shut down. I suffered a useful lesson in awareness as I observed the effect of my own insecurities in the presence of an expectant Other: an effect that I announced, with a rather feeble voice I expect, to mother and son on the drive home.

Witness here, multiple dissociative enactments; that is, transferences, with multiple makings of subjects who are *supposed to know*. “The teacher is supposed to know.... [W]herever there is a subject supposed to know, [Lacan says] transference has already started. Transference is a demand for/an offer of love” (Baldino & Cabral, 2008, p. 76). In pedagogical transference, as Baldino and Cabral present it, “the student gives the teacher his/her attention and the teacher gives his/her knowledge back. None have either” (p. 76). For love, accordingly to Lacan, is “to give what one does not have.... a specular mirage that is essentially deceiving” (Baldino & Cabral, p. 76).

In the end, also the middle (and likewise a middle of research interpretation), the district tutor offered Matt a rewrite of his Module 2 exam and an angst-reducing, friendly warm-up, prior to that event. In mid-January 2011, over the span of ten days, and following illness that had run him a fever¹¹⁸ the week before, Matt wrote his Module 3 exam, the course final exam, and a rewrite of his Module 2 exam (in that order), passing all three and earning a final grade of 60% for the course. In February 11, 2011, just a month ago, we began work on the Grade 11 mathematics program, again in the higher of the two mainstream programs available. Following Matt’s cue, we aspire to complete this work by August 2011 so that he can return to the classroom for Mathematics 12 in the fall of this year. It’s a tall order.

As the above suggests, our relationships (mother, son, tutor) have, and continue to move definitively (albeit unevenly) in the direction of growing mutual trust. I notice that these changes seem to coincide with anxiety, loved somehow into its own waning—a waning that creates openings for curiosity to play more freely with/in mathematics as

¹¹⁸ A common pattern of illnesses seems to coincide with impending test situations and with the beginning of each school year. I do not believe this to be entirely accidental.

object of desire. I currently cannot yet explain these shifts. I expect exploratory forays into such questions to comprise the better part of later thesis work. And so, I merely pause here to register a “choice” to avoid haste and to allow the fecund ripening of thought.

Ultimately, what I can report is a deep, but always nebulous (fledgling things can be fragile), experience of emerging trust interwoven with shifts in self-trust as each of us survive¹¹⁹ revealed vulnerabilities along a process of individual and shared paths. Of the innumerable conflicting and complementary forces colouring this path laid in walking, I offer an exploratory beginning list: (a) my habit of prodding—a function of my own curiosity—into Matt’s sense-making via queries and conjectures as to the what and why of his choices (in some sense, schooling his mentalising [awareness of awareness] in regards his relationship with math); (b) my enthusiasm with mathematics that may make for a too-loud voice: I worry that I, too much, fill uncomfortable spaces with my positive energy and, in terms of the good enough mother who knows to leave and then return, I fear that I do not “leave” enough space or perhaps I return too readily; (c) an early surge of success for Matt over the first summer, as consequence of memorised basic facts¹²⁰, that reinforced false security in and dependence upon rote; (d) Matt’s unfailing positive attitude toward our time together (as consistently reported to and by his parents); (e) his original anxiety-ridden tendency to reduce homework to some version of applying cut-

¹¹⁹ Notice how surviving has come to mean living less fully, somehow a clinging to getting by (see Lasch, 1984), yet in its ordinary etymological sense and my understanding of the French *survivre*, signals something beyond mere living.

¹²⁰ Admittedly, these early gains to some degree masked lack of understanding and thus reinforced a too narrow sense of mathematics as the application of memorized approaches—a reading that subsequently may have wreaked havoc in the ensuing school months when, rather than face “the difficulty,” he instead reached, almost mentally scrambling for the relieved-to-apply technique as oasis in a terrifying desert of angst.

and-paste algorithms, however ineffectual; (f) the strength of his avoidance (initially skipping/dissociating from work that, in his wording, “would be like trying to pick a fight with a bully”) and the frightening discomfort of effortful grappling in the as-yet-uncertain; (g) my insistence on indulging his thinking and taking whatever time it would need to do that; (h) the reality of schedules in the march of schooling; and ultimately (i) the inching open of space into which effort could enjoin risk as opportunity and not as foreclosing darkness.

At this point, I cannot say that we have arrived anywhere, other than further along. It is not nearly time for naming any, perhaps oxymoron-ish, happy ending. And fairy tales are excursions from an other-introjected uncanny. I prefer challenges be left unsettled, shifting, interesting. Mathematics has revealed itself as a contested, non-neutral space in each of the actors of this story’s reckoning. Our work moves to issues of self-narration and self-becoming. Of course, this has always been the case, but I am heartened to see it moving explicitly into verbal formulation as Matt observes and experiences himself differently; that is, as less given by mathematics, and mathematics as less the un-implicated, people-construer it once seemed to be.

Researcher-Teacher Reflections: On the Fly (March, 2011)

The positions of researcher and teacher avail one to particular complicity in collective and individual formulations of experience. My studies in curriculum and pedagogy at the University of British Columbia bring two concerns into increasingly ominous awareness. On the one hand, I grow ever conscious of my partiality, both in terms of bias and ignorance; and still, despite intentions otherwise, I cannot live, situated as I am, outside such bias and ignorance. On the other hand, I recognise more and more

the power and thus responsibility woven through dual imminent roles of researcher and teacher. The first of these awarenesses exacerbates the problem of the second. How might I mindfully proceed—given unavoidable limitations of position, history, and lived experience—to behold and act well *enough* as researcher and teacher?

In answer to this question, an attitude takes shape—one that configures researching and teaching in terms of engaging a productive tension between two constructs: the noun “illusion” and its negative counterpart, the verb “to disillusion.” Illusion combines Latin *in* “not” with *ludere* “to play,” engendering, since its appearance in the mid-14th century, a sense of mockery and the “ludicrous” that plays with playing and performs an “act of deception” (Harper, Online Etymology Dictionary; Stone, 1996). That which is illusion—not play, but a playing with play—mocks play and ought not be trusted. Yet, relational psychoanalytic theory (see: Milner, 1952/1987b, especially pp. 94–102; D. B. Stern, 2003, pp. 65–79, on “curiosity”, “creative disorder”, & rescuing “unformulated experience from the oblivion of the familiar” [p. 79]; & of course, Winnicott, 1971/2005, pp. 13–19) revisits illusion in an originary context that values the seriousness in the play of play; that is, in play’s latitude and possibility. If illusion is negatively thought, then, “to disillusion” as to “free from deception”, circa 1851 (Dictionary.com, 2009) might fairly be expected to engender positive notions. Not so. “To disillusion” is “to disenchant, burst the bubble, disabuse, disappoint, disenthral, sadden, dismay, [and] frustrate” (Dictionary.com, 2009). My point here is a revaluing of both illusion and disillusionment towards a mindfully complicit conception of research and teaching—if such a paradox is at all fathomable.

Though one *cannot* illusion another, one *can* thusly disillusion. The grammar of these constructions points productively to particular moments of researching and teaching. One cannot force illusionment in another. It is a matter of spontaneous emergence associated with gnosis—the wisdom tradition of intuitive, mystic, poietic knowing (Davis, 2004, pp. 27–30, 39–44). Through research and in teaching, one instead occasions the conditions for illusion’s possibility and the subsequent consideration of its imaginative givings. Conversely, and working within the epistemic constraints of everyday pragmatics, both researcher and teacher act as disillusioners to press a practical interruptive world against those formulations conceived through and after illusion. The disillusioning moment asks if the construction following illusion affords substantive-enough sense or if it remains illusively surreal. Milner analogises from psychoanalyst to teacher (1956/1987a, pp. 187–188): Both seek the creation of spaces, safe and open enough, to allow a state of “absentmindedness,” the entertainment of illusion, and the possibility for experiencing a “sense in inner nonsense” (p. 188). In counterbalance, the teacher as psychoanalyst presses “merciful interruptions to disillusion” (p. 188) and concretise imagination in a “real” world.

How might I as teacher and researcher use the complementary tensions of illusion and disillusionment to address a problem of partial and complicit action in the formulation of experience—which is to say, in the making of the world? A first movement would be one that resists the urge to dictate behaviour and constrain what could otherwise freely emerge out of unformulated experiences into deeply felt understandings. At the same time, not all that is construed is sufficiently suited, or remains so, in a shifting world. Just as the hermeneutic narratives of CSI are interrupted

and reconstrued in light of newly understood evidence, so too, the world interrupts interpretations and dictates when they are “but” illusions. Deconstruction and construction, unfolding and enfolding, work with and against each other in a world that recognises foundations as always contingent in time and place.

Put differently, the gesture from illusion and a gnosis tradition calls for openness, possibility, and the valuing of difference in research and theorising as, for example, are articulated in feminist standpoint theory (Harding, 2004), emphasised in Haraway’s situated knowledges (1991/2004), mapped in phenomenographic expressions of understanding (Marton, 1986; Paulston & Liebman, 1994), and performed in the queering of theory (Butler, 1993). In parallel fashion, teaching, when informed by psychoanalytic theory, takes an approach that allows “the possibilities implicit in experience to impress themselves on... consciousness” (Donnel Stern, 2003, p. 78). It does so by working through processes of verbal symbolisation to mark, even as they participate in, the “progressive awakening of curiosity, a movement from familiar chaos [that which is diffusely known] to creative disorder [that of which we become reflectively aware]” (p. 77). Teaching to embrace illusion is to engage interpersonal spaces in ways that draw from the creative wellspring of Stern’s as-yet-unformulated, unworded, experiences existent within the self (but illusively and paradoxically conceived there through language). To teach in this manner is to acknowledge the world within a self while recognising the need for an individual wording into being of that self’s understanding of the world.

While illusionment’s complicity in enabling the subsequent formulation of foundations might feel decidedly modern, its patience with uncertainty (and attention to

the particular) shifts illusion, both in teaching and in researching, into the realm of the post-modern. Disillusionment too aligns with a post-modern deconstructive gesture that asks after, and is not seduced by, an illusion of certainty that seems to converge on “contingent foundations”¹²¹ when preemptively packaged as naturalised forms. Teacher and researcher as conscious disillusioner acts to notice and practically remind of an interruptive world. When both elements are held in tension, a difficult-to-enact conception of researching and teaching emerges to honour the ongoing and reiterative freeing of creative energy even as that energy weaves itself in and through subsequent shaping and reshaping of meaning.

I write these thoughts here to remind myself, as best I can, of the potential import in the direction in which I have embarked in doctoral studies. At the same time, I do marvel at my audacity of thinking any influence at all. The point is to be humble about being humble and to do so as mindfully as I can. If I can proceed with at least an intention of openness to possibility, difference, and the other, and if I can find a way to intertwine such openness with a skepticism that asks after the constructions I am apt to create or encounter, then perhaps that is as fecund a middle-space as any into which I might jump.

¹²¹ In my use of the expression “contingent foundations” I mean to invoke Judith Butler’s essay of the same name (1992); that for me, consists with Thomas Kuhn’s first outlaying (1996) of the example of science as likewise contingently founded—an example evidenced in his observation of paradigmatic “foundational” shifts as scientific revolutions. The point here is the contingency of foundationalist presuppositions of anything we might construe as “truth.” Crucially, Butler’s thesis in “Contingent Foundations” is not to argue for the eradication of foundations (p. 7) nor to forward an anti-foundationalist position, but rather “to interrogate what the theoretical move that establishes foundations *authorizes*, and what precisely it excludes or forecloses” (p. 7). To this end, Butler advances an ethical epistemological stance toward any totalising notion—be it of a subject, an “I,” a nation, a theory, or any foundationalist claim to universality—that would relieve it “of its foundationalist weight [by leaving any such term] permanently open, permanently contested, [and] permanently contingent” (p. 8). I agree.

Mathematics

One might ask at this point, how the connection can be made from Cartesian and narcissistic anxieties to mathematical ones. It is Cartesian foundationalism and narcissistic yearning for originary omnipotence that sets up the conditions for mathematical elitism, its feigned neutrality and also mathematics anxiety. Especially in educational discourses, mathematics constitutes prominent exemplar here as site of acute manifestation of Cartesian and narcissistic anxieties. It is the place in schooling where these forces converge, breeching the dyke, as it were. This owes to mathematics' construction in schools and in culture as neutral and given of the world.

Mathematics, as traditionally understood, presents itself as that discipline immune to the limitations of hermeneutic approaches to resolutions of ambiguity. It is widely held as difficult but unambiguous. In supposed unambiguity, it parades as giver of fact and thus affords little conceptual space for making the sense that the mind must do—some minds quicker than others at this. The swiftness with which children do make sense, any early sense that is, teaches that there is no space between the given and the made of mathematics. Yet, as learners advance in the discipline, that transitional space between mathematics as given and mathematics as made enlarges till eventually, learners unsupported in knowing their own autopoietic capacities in mathematical thinking, find themselves falling into a confounding abyss. The longer one is able to leap across, without poietic sense-making (that is, by mere rote), the greater is a false certainty and the more one can strap oneself securely to a neutrally given world. As such a person becomes a believer and worshipper at the altar of right ways. And if habits are pushed to a place where individuals do fall between, hopelessly lost in a sea of senselessness, then

that seems to give cause for self-descriptions according to some variant of: I was never good at mathematics or I was the victim of some bad teacher, or schooling system. In other words the self-narrative of “not me” seems the only plausible explanation for such strange turns of events. Where there is no historical consciousness of a self-condition as through mathematics, then it becomes easy to chalk success or failure to that rule of the haves and have nots when it comes to that quirky ability!

To repeat, it is not enough to criticise. If afforded a choice, it is a logic of self-continuity that dictates that we avoid releasing a grip on one paradigm without, either a viable alternative waiting in the wings, or intermediary support—a safety net, a holding environment—as we shape that alternative. Accordingly, I draw from the literature framed and developed in the preceding chapters to consider how we might proceed differently. In seeking a conversation about alternative solutions, I move to explore a metaphor of teaching as giving audience and with that the complementary gestures of listening and bearing witness. Drawing from observations on the nature of a *natural human pedagogy*, and of *mirroring*—as especially described in terms of the qualities of *contingency, markedness and containment* and the effect of these on the emerging autopoietic self—I bring these notions into a discourse of schools as fathomable small-theatres of world where the objects of play are scripts extracted from disciplinary texts and where students participate in the re/production of these scripts, themselves constituting worldly perturbations on awareness, such that new senses, as fashionable coherences, can be made.

Natural human pedagogical *mirroring*—when it is *temporally attuned* to and *sufficiently contingent* upon infant acts—functions like the reflection in Narcissus’s pond, first announcing the learner’s presence as visible—in the world. The learner reads: *I exist*.

Moreover, when the pedagogue returns mirroring that is likewise *marked as* an interpretive reflection of the child’s act, and *not an exact replica* fully experienced by the adult, then the learner is prompted to consider that, *not only do I exist, but the pedagogue does too*. The other has her own mind, the experience of which prompts in the child the beginnings of a theory of mind with the ability to mentalise and know difference not as threat. In so doing, marked mirroring diminishes the child’s felt responsibility for the parent’s (and subsequently the teacher’s and publics’) affect and alleviates the burden of her or his own omnipotence. *Mirroring that is marked affords a world of “I and you”*—where neither is to be presumed, and only out of which inheres the possibility of a collective *we*.

Finally, when the attuned other, as teacher, mirrors more than the child’s reflected act—*when that pedagogue returns a reflection of the child with a safe-enough containing (and at times interruptive) world—then the child, as learner, has opportunity to learn of something larger than the two of them*. When the gesture to bring in world is given as an opportunity for pretend play in the spaces of scripts and in their writing and refashioning, rather than a demand for pretense, then the pedagogue also makes room for an experience of *jouissance* in learning as a shared being with others in a contingently-detectable world.

How do we adequately address a problem for an individual, a discipline, or a schooling system (schooling systems being those places that most innovations tend to focus their efforts) when instances, individually and taken together, are simultaneous

expressions, at different levels of complexity, of a pervasive pathology running through and characterising the entire system? It would not suffice to confine our address to localised expressions of anxiety in mathematics without concern for anxieties transphenomenal etiology that conditions this cultural malaise. If we remove the particular target of anxiety, then yes, our assessments, I expect, will show “achievement.” That is, if we purport to ensure student success in mathematics by affording more structure and decreasing the play of the scripts, directing carefully each scene, then how do we not heighten the expectation and subsequent need for the certain constructions of the other?

Anxiety moves. It is not the object of phobia that should draw our attention, but rather what these anxieties signal about selves and the cultural practices-become-habit that promulgate such minimal selfhood in the first place. In effect, borrowing from the popular language of codependency as poor substitute for singular plural being, schools have for half a century now at least been actively enabling cultural preoccupations with certainty. Failures—as micro-crises to prompt critical turning points in learners to redirect success—having lost their teaching opportunity assemble and condition failures as macro-crises to prompt critical turning points in cultures (as learners) to redirect success. For anxiety is that which cannot deceive. It will displace itself elsewhere.

Why mathematics in particular? Surely this supposedly “neutral,” schooled discipline is no more nor less implicated than any other. To presume that mathematics is neutral is indeed the central conditioning fiction of its angst-producing nature. To presume that mathematics is neutral, even for those of us comfortably at play in its milieu, is to miss the point of Descartes projection into the Modern, and to miss the

always socio-affective underpinnings upon which selfhood and identity rely and to which they metaphorically refer. Radical embodiment, must presuppose emotion and feeling, of language and being, as underneath and buoying all that we humanly do. That we can and do bracket parts of ourselves, these always and at once parts of others, is not to say that those parts are not at play: Dissociated and disavowed parts of self, working from their shadowy places, make possible such circular fictions as disembodied pure forms—the phenomenality of which is indeed embodied. If mathematics is neutral, then we are less whole for it and someone and some part of us is carrying the burden of that feigned neutrality.

In what way, if at all, does the Cartesian “reality”—about the world, knowledge, mathematics, and one’s particular existence vis-à-vis mathematical knowing in world—allow a view to the self, of the self, in that world (and what other views are thus occluded)? Put differently, if mathematics is the looking glass, then what self-image is made possible given the mirror’s construction in and by a virtually-real Cartesian world? Moreover, to what degree, if at all, is the mirrored image an appropriate-enough rendering; that is, one sufficiently contingent upon the nature of the viewing self to give audience to that self (even while announcing the mirror’s complicity as artifact of cultural co-presence) in ways that prompt self-knowing and self-grace toward resolving ambiguities of good and bad selves? *The unspoken question to the mathematics student might be thus: Can you recognise yourself in this mirror, is the other there, and the world too? And is the view, given and made, one that opens agentive possibility for you to play at becoming in and with the world?*

Mathematics, the schooled discipline, is every bit offspring of the Cartesian perspective expressing a denial of the “irrationally” real. A mathematics that presents and professes itself as neutral, and is commonly-understood as such, is one that attempts to circumvent the making of deeply-informed meanings, these linked to unformulated emotionings through bodily experience. We can witness how these things play out in the classroom: For example, a teaching, learning, and knowing perspective that positions manipulatives as silly child’s play, or who teaches them as an “add-on” (because it is part of the program of studies) rather than teaching to mathematical understanding “through them” is one who has lost the connection and relevance of mathematics to bodily experience.

Yet, this socially pervasive construction of neutrality and groundless abstraction seems to fly in the face of mathematicians’ reported understanding and experience of mathematics. In “Reification as the Birth of Metaphor” (1994) Anna Sfard details the intricacies of understanding as described by mathematicians. They report meaning-making in mathematics in relation to and through the physical. She writes, “*however long the chain of metaphors may be, whatever is going on in our mind is primarily rooted in our body* [emphasis added]” (p. 47). And yet, though she explicates this as apt descriptor for mathematicians’ understandings, she muses over how this rooting of mathematics to body seems to be challenging to achieve in normal everyday schooling encounters:

The study of mathematicians’ ways of thinking brings an important and probably quite universal message about the nature and conditions of understanding. The role of the metaphor of an object in this process cannot be overestimated... [T]he immediate implication is that, as teachers, we... help "novices" construct their

own structural metaphors.... *Studies have shown that even the most sincere efforts to bring about the appropriate metaphor will often be rewarded with only limited success* [emphasis added]. (p. 54)

We might say that the Cartesian perspective—emblematised in school mathematics—*encourages dissociation* of an affective self and *discourages formulations* of the uncanny unknown, and bodily experienced, into conscious, creatively accessible, experience. The result? The anxious child in the face of mathematics, is very much like a “deer in headlights.”

To concretise what I am trying to say, consider several real life representative casualties, drawn from an unending stream, over my 30 years of mathematics teaching. Consider student A, call her Abbey, in Grade 7: A meticulous, sincere, well-organised student, who exhibited an unusual behaviour, peculiar to mathematics and no where else evident in my and other teacher’s encounters with her: During mathematics lessons her eyes would be trained to her desk. While professing to listen attentively, she refused to lift her gaze to the board and this was even the case during geometry demonstrations. To look at the board would instate in her such terror as to render her helplessly dissociated, in shock, like the deer in headlights. Her parents defended this behaviour and asked for a list of steps that she could otherwise use to traverse with certain safety this treacherous mathematical landscape. I wondered what coincidence it was that her mother evinced the same sort of rigorous orderly approach to world and daughter. In any case, between the various dictates on “how to,” there was left little space in this child’s life to create meaning especially when it came to a discipline thought so clear-cut and rigorous as

mathematics. Instead this family expected and lived mathematics as step-following. The Cartesian spirit seemed alive and thriving in a most debilitating way.

Now turn to student B, call her Billie: daring, creative, artistic, and in this case fully open to grappling with the sense of mathematics, though in our first encounters she professed how it made little sense to her. Indeed, most of our lessons entailed some derivative of her proclaiming that, whatever the point, the essence of mathematical leaps eluded her. So I would probe her mind to ascertain the sense that she was making and, in the doing, found myself regularly fascinated. The rich difference with which she perceived and made sense of the most everyday mathematical constructs became a source of insight and depth for me and the entire class. I taught her for three years, Grades 6, 7, and 8, with much success not only in my class, but as evidenced in provincial achievement tests, yet with her graduation to high school mathematics she was again forced into the constraints of algorithmic givens against which she would balk at every turn. This gifted student had dropped out of school by the end of grade 10—another casualty of a one-size-fits-all, decidedly uncreative, construal of mathematics as step-following.

Finally consider the humanities/band teacher, one of the most creative thinkers I knew on staff, who, one year, found himself faced with a single, exacerbating, mathematics class to teach. True to his experience of mathematics and despite my encouragement that he proceed in the same way as he might for a humanities course or a band class—attendant to interpretation, where for example various explorations of situated meanings could be considered such that a shared emergent understanding might

be created in process—he acceded to the formulaic three-step lesson of homework check, demonstration, and classroom practice.

He understood himself as not having the “time” to consider student work in any terms other than right and wrong, or degrees thereof, nor to advance to whole class orchestrations or engage something akin to improvisational work. In other words, he delivered lessons according to his Cartesian understanding of mathematics as affectively neutral and a matter of following directions and applying specific algorithms on demand in response to appropriate contexts. There was little place for classroom dialogue, for grappling with meaning-making. The program of studies was considered too thick and, to make matters worse, the students seemed not to have retained the previous year’s learning. And so, for example, rather than investigating proportionality conceptually and dialogically, lessons became exercises in perfecting the trick of cross-multiplication.

This teacher—enacting an everywhere-circulating, insidious belief about mathematics, and following a Cartesian mantra of efficiency—could not see the possibility of having time to dig into student work, much less afford feedback in the manner in which he conducted his humanities classes. Mathematics in his virtual world was not about, for example, prompting conversations to probe meaning, highlight interesting ambiguities, and soliciting clarifications and favoured approaches to solution-making. In these and similar ways we continue and have been continuing to formulate a virtual Cartesian world with all its privileging of technique into our current real. It constitutes the knowing that we enact and that performs us into continued debilitations of being.

The significance of the above anecdotes is to demonstrate the myriad ways in which an insidious Cartesian worldview continues as a “preferred” virtual reality nowhere more rigorously enforced than in school mathematics. As such, the thing in itself, becomes/is that which we make of it. And yet the point that I emphasise is neither to berate current teaching methods nor to devise better technique (though, in today’s world that seems a quick route to a kind of big business of good fortune). The point is rather that these casualties emanate from fundamentally deeper conditionings of selves and cultures that are pervasive and rhizomatic throughout modern and post-modern worlds. If we continue to try to technologise solutions, we merely reinstate more of the same.

What I hope to provoke, or maybe nudge loose, in this dissertation is more core and central to our individual and collective being. If we are ever going to do something about current situations, no quick fix will do, nor will a revolution that installs a different iteration of sameness in striving toward some objective truth or abandoning ourselves to utter relativity. These strike me as cowardly—yes, cowardly—other-blaming choices that fail to attend to the heart of matters. How does one approach the teaching of teachers in manner that values *phronesis*, a desire to probe and prompt understandings of understanding, such that any *techne* that emerges in the doing is particular, situated, and contextualised according to lived evolving experiences. And if we are to study technique, *per se*, then perhaps we would do better to study that phenomenon in its myriad instances in the hopes such study might bring us to a better appreciation of what is at play when we advocate, hail, or appropriate method, one-track, as panacea.

How would such inquiries look? It might begin with a critical study of Cartesian and non-Cartesian perspectives on the real: for example, as in a juxtaposition of Jones' book *The Lamp of Love: Stories by Sathya Sai Baba* and the perspectives espoused by Maturana and Verden-Zöllner in *The Origin of Humanness in the Biology of Love*—a consideration of what the various perspectives in terms of what they open up and allow, and what they foreclose. In taking embodied cognition seriously—where cognition is a biological phenomenon (Maturana, 1990, p. 210)—and developing this notion to the full consequences of what we might know, they reconceive of reality as “an explanatory notion... on human experience [offered] with the full awareness that we human beings cannot distinguish in the experience between what we call in our daily life perception and illusion (Maturana, 1990)” (p. 210). In short, Maturana and Verdin-Zöllner write, and I agree, that we have but little recourse but to live with the indiscernability of perception of a real from the creation of illusion. That said, in the situation of repeatedly failed searches for an absolute Archimedian foundation, this condition of indiscernability need not prescribe demise, leastwise not unless we continue to endorse and instantiate the Cartesian perspective as lived real.

Thankfully, “we do not have to do everything that is possible for us to do, we can choose. We do not have to live all the realities that we may create, they are not equally desirable if one has self-respect and social consciousness” (Maturana & Verden-Zöllner, 2008, p. 211). We are left to grapple with finding suitability and fit here in messy and shifting earthy places—a consequence that might be thought at first a reassuring lesser of evils, if we can learn to live with it, though ultimately I cannot imagine it evil in any way.

Yes, we are a far cry from the Cartesian ideal, but if we cling to that as our desire, we do indeed face the anxiety of not knowing—and therefore being—that which is absolutely, once and for all, right, good, and true. Of embodied cognition, Maturana & Verden-Zöller (2008) write,

Our conscious and unconscious psychic living is never virtual. We are transformed and become in our bodyhoods according to our psychic existence, and our psychic existence changes according to how our bodyhoods change regardless of whether what we live arises at any moment through virtual or non-virtual realities. (p. 212)

In advocating the virtuosity of bracketed irrationality as pathway to at least partial knowledge, Descartes' foundationalism continued a Western tradition that had flourished since the time of the Greeks—one of access to power and control via the exercising of will—that is, will supposedly freed through the exorcising of bodily desire. Thus, in the Cartesian construction, free will arises from and is tempered according to such judicious discernments as are suited to one's own degree of understanding. Implicit, in this framing, is that responsible will entails in acting in awareness of what one does not know. In this, "Descartes never really doubts that one can achieve... self-transparency and self-understanding" (Bernstein, 1983, p. 116). One could say that the reflective gaze is a narcissistic one, transfixed as it is into the self.¹²² Descartes describes a path to discovering the "groundlessness of former opinions and prejudices" in "bracket[ing] or suspend[ing] judgment in everything that can be doubted" (Bernstein, p. 116). Apparently, we are to accomplish this feat through austerity and self-denial.

¹²² "When you gaze long into an abyss the abyss also gazes into you" (Nietzsche, 1889/1997, Apophthegm 146).

When Conflicting Narratives Collide

Matt both recoils and rails against implicit Cartesian invocations even as he subscribes to them. He is weary in the face of mathematics. His weariness arises not out of effortful practice—that would be rejuvenating. Instead, it is the consequence of psychic effort rallied to face a flogging, because the only way to the other side, he is advised, is through the gauntlet. This is the lesson that the world breathes into him through his education in schools, through his teachers and parents, and regularly affirmed in his mother actions.

When I first meet him he is already over weary and that weariness has, and for a time continues to be, intermittently expressed in illness, and neither any feigned sort, rather, illness as consequence of an immune system crumbling under the weight of that which his consciousness fails to repress: The voice of the Other within¹²³ saying that he can never being enough. In some sense he has become receptacle for a cascading of anxieties transferred from other bodies and pooling in him such that his anxiety is not his own and yet he owns it. His anxiety entangles in the inaccessible Other's desire.

The participants in his world do not choose to witness this; that is, they comply with his desire to remain hidden. He wants no audience and so they collude in his wearing well a schooled persona of calm astuteness. He has mastered his evasion. Accordingly, observing behaviour and frequent illness, they name such illness as bad luck and infer blame in a connection between illness at “crunch time” and laziness until

¹²³ According to Baldino and Cabral, Lacan would say, “the unconscious is not *yours*, it is not inside you, it is the discourse of the Other made through you, it is *outside*. As is the case for everybody you too have been taught what to *desire*” (2008, p. 66).

“crunch” time. Recall Sonia narrating a conversation with Matt’s Grade 9 mathematics teacher:

I actually put a lot of effort into trying to get his teacher last year to tell me in an analytical way what the issues were, what was keeping Matt from being successful.... so that I could communicate that to his tutor.... He was completely unable to answer, other than saying Matt wasn’t trying hard enough. And that’s pretty typical. (December, 2009)

Sonia later describes Matt’s “typical rhythm. This is the time of the year [approaching a testing period] when his stress levels start to go up.... He just screws around the first part of the year and then there’s a point... when he realises he has to get through” (Sonia, March 4, 2010).

It’s as though the world fails to see, or refuses to acknowledge, Matt’s constant companion: The dis-ease of anxiety and all its manifest symptoms, these arising out of the ever-present impending doom of being “called out”—of failing to quell the voice from within as it is spoken aloud, naming and interpellating him again as wanting.

It was never mathematics *per se* but rather Cartesian and narcissistic forces at furtive play and, construing schools as available petri-dishes, newly sterilised each September, came to flourish in a particular cultural medium of mathematics. That is how mathematics came to be the site of dis-ease visiting anguish on Matt and all those who name mathematics as trigger of phobic fear (documented most thoroughly in Burns, *Math: Facing an American Phobia*, 1998).

Matt’s condition is further exacerbated by a home milieu that constitutes him as member of a chosen academic elite—able and better, in regards that count. Indeed, his

home operates in ways at overtly drastic odds with any socio-cultural undercurrent advocating self-denial, much less any ascetic kind of martyrdom as accession to nirvana, enlightenment, or some other omnipotent at-oneness. His parents laud Matt's ability to work the system. Whilst acceding to the proviso that he should not short-change his own learning, they congratulate him for such acts as skipping the class for which a paper is due and producing it to the teacher at the end of class time. Sonia recounts with a wry smile, a hint sardonic, and a sense I pick of his teacher's gullibility, "You really can't fault him. I mean, it's a smart move, if they're going to let him get away with it." She likewise notes Matt's initiative for organising his teacher to schedule the writing of a missed test, not over his lunch hour, but rather during what would have been our scheduled mathematics time.

As only son, he inhabits a contradictory position within his family: where his male stature and privilege—with father as comrade (they male-bond over hikes and concerts enjoyed together)—tacitly come to deny difficulty, sending it underground. Together, family contrive and support an external image of Matt as more mature than his peers. They regularly speak in Matt's absence in terms of his decisions, though I see no evidence of such decision-making on his part. Indeed, the discourse is at odds with acts that tacitly preempt choice for him and that speak of and for him. He is organised and told how to be and who he is. The incongruences abound and are pathologising in as much as they express denials each of the other. So too, do the school narratives come as affronts denying these home-made constructions, naming it pretense. And the response of parents is to point blame and deny the denials. Sonia and Warren adamantly describe their various encounters with exasperatingly uncooperative and ineffectual teaching and

administrative staff. All the while, Matt is regularly taken to task—found out, and found wanting, in disciplinary school arenas. On more than one occasion Matt describes this pressure that he everywhere feels: “It sucks when my friends know what my parents do and they’re always asking me why I don’t do as good as other kids in school.”

Interestingly, though professionals themselves, both parents, but especially Sonia is loquacious and off-handed in expressing impatience with the impracticality of academia. She regularly cajoles me for my enthusiastic engagement with research and comprehensive exam preparation. I am constructed as that endearing “nerd” who doesn’t have a life. In one conversation where I recount my enthusiasm over reading Elizabeth Ellsworth’s work, “Why doesn’t this feel empowering,” Sonia dismisses it, commenting that it sounds like this Ellsworth “just needs to get over herself.” Later, when I describe a notable educational theorist, Madeleine Grumet, coming to speak, and how moved I had been by my reading of her book *Bitter Milk*, Sonia offers the advice that, I will likely be disappointed because these academics get something in their heads, write a book, and then don’t say anything new after that one claim to fame. Most dramatically and disconcerting for me, I watch and ineffectually try to soften the blows, even as I succumb to them, in a derailing of Matt’s Grade 10 mathematics teacher by mother during a three-way December 2009 conversation around Matt’s, then unavoidable, failure.

It is no surprise, leastwise to me, that Matt retreats and refuses. With each refusal he marks himself “safely” absent. Not brought up to believe in any Almighty deity he is confronted everywhere by its spectre—indeed, he is at once called out by it and expected to be *it*. And he struggles with both impossible roles at once. He chooses inertia as a kind of frozen passive resistance to Othering forces of mathematics and school that speak at

once the same and a different narrative from those at home—the difference being that the school implicitly is the place of calling out. The gauntlet must persist. The semester where mother had overseen the distance course brought two clashing narratives in unsustainable close proximity. Matt must be educated elsewhere or the pathologies of clashing incoherence escalate, becoming expressed in fits of rage. Recall:

Sonia: Yeah, I had to make him do it in the evenings. The whole thing was instrumental and strategic, and all about getting him to pass, which was not helpful.... And he did pass, but it didn't enhance any of his mathematical understanding or reasoning. It was very stressful.

Warren: It was very stressful.

Sonia: I can't do it anymore. It's just not a good place. The math gets entangled with our relationship and we have enough stress without that. I would much rather just be the supportive mom getting him where he needs to go.

Warren: But, with you doing the math, it's different. He's not as stressed with the work.

Sonia: I think that's actually true.

Warren: He doesn't complain about going to tutoring.

Sonia: It's true, he never does.

Warren: When you ask him, and he has math homework, he does it and it's not so much a trial.

Sonia: In the past he'd get angry.

Warren: Very serious acting out kind of stuff.

Sonia: Slamming things. He doesn't do that ever now.

Occupying a stance on awkward debilitating groundlessness, Matt attempts to hold at bay implicit oversights to his own presence—he becomes an outward existence, if not constructed according to an out-of-reach judging Cartesian bully, then an existence denied by all of the various outward constructions of self that he *must* be. Matt can find in such places but little possibility for self-becoming and no adequate image reflected back to him in the “calling out” faces of mathematics and schooling. So he hides his own face from their view—from any mirror.

In the framing of mathematics as reasonable, self-evident, memorisable, and seemingly given from on high there is no room for inefficient wasteful, though pleasant-enough play, at sense-making. We hear it between the lines of his parents descriptions of what I do with him. A rational self, gets down to business and becomes the successful mathematics test-taker and a self afforded a recognisable existence anywhere viewable and so “mirrorable.” And though Matt is named and constructed as just such a rational self, he fails to produce himself in any way presentable and present in mathematics’ intimidating demand to performance.

July 9, 2011

Sonia: Just wanted to touch base and say thank you... I think he still has one

question... that he may need your help with when you get back....

I also wanted to give you a heads up that Matt desperately wants to go to M.

Island with his girlfriend and her family on July 20th... I've told him he can go if he takes the Module 3 exam that morning. *[Note the emphasis on writing the exam, not on the consequence of another run through the gauntlet.]* This means

he will need to work like a devil to complete Assignment 4 in the Module. But I'm willing to let him make that commitment if he is motivated.

July 12, 2011

Lissa: Yowsers on going zoom... not sure how much can "stick." [*We have not yet worked through the lessons leading up to Assignment 3, much less Assignment 4.*]

Seven days later:

July 19, 2011, a noon email following morning tutoring.

Sonia: What is your honest assessment of whether it is wise for Matt to take the Module 3 test tomorrow?

I receive this message painfully aware of many things: First, it is surely more exam than test and only now do I notice the subtle downgrading of its weightiness. More importantly, I am worried. We have been skipping the lesson exercises and going straight to the assignments. Access to the exam is through the submission of the assignments. If we do not do them together, his mother will make him do them on his own and submit them, completed or not—with understanding or not—this belief constituted out of my prior learning with her. And so I formulate and send a lengthy reply detailing just how shortsighted and unwise it is to have him write this “test” tomorrow.

July 19, 2011, later in the evening Matt comes back for two more hours at his request.

Lissa: So here's what I wrote to your mom: [I read the email aloud to Matt.]

Matt: I just want to get done.

Lissa: I know, but here's the thing: The questions on those assignments are actually easier than the questions in the lessons. And I don't know how hard the test is going to be.

Matt: I find the test is usually a bit— It's the same concepts, it just requires more thinking.

Lissa: Yeah, but it's really shaky because I only just showed it to you, half that stuff, and the lessons actually have much harder examples and much harder questions, so you just got the bare minimum. So—

Matt: —unprepared for hard questions. Well, I'm not really worried about not passing any more. I'll pass. On the last test I did really good.

Lissa: How did you do? You never told me.

Matt: 78%

Lissa: If you pull it off, I'm going to think you're brilliant. I don't think I could pull it off.

July 20, 2011, preparing with me the morning of the test.

Lissa: Ah [sigh]. I feel panic in you. Maybe drugs could help. [Laughter.]

Matt: I already took some Ritalin.

...

Lissa: Are you locked into doing this module test?

Matt: Yeah.

Lissa: Like currently? You can't back out of it now?

Matt: Um. I don't think so.

Lissa: What you really should do is all these reviews before you go in to do a test.

Matt: Yeah. I could ask my mom, but

Lissa: It's up to you but, I don't know how you're going to do it.

Matt: I definitely feel like I would benefit a lot from more time.

Lissa: Yeah. You've got half a year that you need to review. Sigh. We'll just use this time and then you decide because I think I made it clear in that email to your mom.

Lissa: ...What's that?

Matt: "A"-squared plus "a"-squared? is "a" to the power of 4?

Lissa: OK—

Matt: I mean 2 "a"-squared.

Lissa: Yeah. Thanks. [Humour.] Good. Everything's going away that you know.

[Gently marking his affect.] OK. $2a^2$ equals? And what's 8^2 ?

Matt: Oh I have to solve for "a." [Feigned laugh-cry... diffusing.]

Lissa: Just figure out 8^2 . You're all— You're so in panic mode. 8 times 8? Thank you.

[Subdued conversation as he engages the work.]

July 21, 2011, email from Sonia the day after the exam.

Sonia: Well, we shall see, but Matt did not feel very good about the test... doesn't think he passed. He felt OK about the MC [multiple choice], but thought the open ended questions were really difficult. If the result wasn't good perhaps I can see if he can do a rewrite. It was a gamble to *let* him rush into the test and probably didn't pay off. But, onward to next week.

Donnel Stern in *Unformulated Experience* draws from hermeneutic sensibilities, writing: "Understanding... is inevitably a matter of selecting and formulating one

interpretation from the multiple plausible alternatives in any given situation” (2003, p. 208). I add a companion thought, one I consider central to well-being: *In a beheld reality (as both given and taken) the breadth of the perceived horizon of possibility from any particular moment turns on the available and conjurable narratives through which that self’s consciousness can construe the moment into being and having become.* Out of potent possible construing of the past arise fecund futures, these existing in and conditioning the present. Thus in reciprocal fashion, agency becomes inextricably intertwined with: (a) one’s freedom in the creative, recursive, and adaptive construction of self and (b) a complementary capacity to construe understanding—that is, to sufficiently interpret and extrapolate to a verisimilous-enough narrative on one’s reality from unavoidably partial perspectives. In this way, interpretation shapes learning and that which can be known about the world and a self in that world.

Out of Matt’s self-narratives, implicit and explicit, and my intimate awareness of the dynamics of his relationship, I seek to create openings where he might find himself differently-abled. This is something I note myself doing throughout our work together and especially gaining more prominent and explicit presence across the later transcripts.

In the next excerpted sequence, I perceive him oscillating at the edge of significant changes of self, so I use the event to construe a different narrative from the tacit one he inhabits. Put differently, I hold a mirror up to him and suggest a different possible interpretation to him of himself and the situation—one that leads to a different future and that dares him to step into the “myth” of self-ownership, claiming it, shaping it into a chosen real. In short, I give him a bridge to become that which his mom both wishes and appears to circumvent—an opportunity to project an agentive self out of the

constraints of his perceivable past lived experiences. I offer this as increasingly viable option for shedding the tacit debilitating narrative he previously inhabits. I make efforts to lay forth my biases explicitly in as much as I am aware of them.

July 25, 2011

Lissa: Now I wanted to ask you one thing. What I was thinking when you left on Wednesday, the day of the test, you were thinking about not writing the test and I said, “Suggest it to your mom.” And I thought that you probably wouldn’t suggest it to your mom. I do think that if you had suggested it to her, she would have said, “OK don’t write it.” I don’t know. I actually think she respects you a lot more than you maybe— No, I think you know that she does. I think you just don’t want to let her down. *[I am watching and responding to his body language as I speak.]*

Matt: That was it. Yeah.

Lissa: Yeah. I think that you know that if you’d said no, she’d still be fine.

Matt: That’s what she said after. She said that if I didn’t think that I was prepared that she wouldn’t make me write it.

Lissa: So what do you think? OK. Because it would make her happy if you wrote it and got it done, because that’s how it was set up. But what do you think— how would she have felt? Or, here’s my thinking, rather than do a leading question. I think she might respect you more if you actually said, “No, I’m not ready.” I think that would actually—I mean, it would be hard to take, in her head space.

Matt: M-hm.

Lissa: But, actually it sort of shows more gumption. It's like, "I know myself" and it sort of shift things so that you make the call and you sort of prove yourself more and more trustworthy. *[Trying to get him to shift responsibility onto himself for himself, instead of onto himself for his mom. If he presences himself, then she becomes his audience.]*

Matt: M. Yeah.

Lissa: ...It's like slipping into that space and claiming your own. Because there seems to me to be a great deal of respect.

Matt: M-hm.

Lissa: Around, in your family. You know, for each person's individual thought processes. But, like, step into the space.

Matt: Yeah.

Lissa: The other thing I was wondering about: I remember coming out of high school, I never really considered going into architecture, because it just seemed not an option. It's like someone lays a path in front of you, and you just go along walking it. It's the path of least resistance. You don't think outside the box. And maybe that's part of it too—outside the box of what someone else has prepared a path for you. And you're just kind of used to it and it doesn't seem like it's worth making any waves.

Matt: Yeah. I understand what you mean. Yeah, I definitely didn't feel as prepared as I know that I could have. If I just maybe had had a few more days. I guess it's a lesson to be learned.

Lissa: That's good. There's no mistakes, there's just stuff to learn. Cool.

Note that the preceding exchanges occurred in the final month of our two years together. By then, Matt brought a fairly robust and coherent network of recent understandings into present mathematical challenges. Though anxiety had clearly diminished. Recall the following exchange:

April 12, 2011

Lissa: So what time are we working till?

Matt: Three o'clock.

Lissa: So just 15 minutes?

Matt: Yeah. This is stupid. [Said, under his breath. It is stupid that we are meeting for only 15 minutes.]

[We work 25 minutes longer, making time not given, and his spirits rise as he engages the material.]

Matt: You know it's kinda relaxing doing this. *It takes your mind off other things.*

As we moved forward, Matt became more relaxed with the mathematics. His 78% on the functions and quadratics exam and his desire to look at a returned assignment—approaching rather than avoiding what the errors might show him—are both significant markers. Heartened by these shifts, my focus shifted too. I moved to provoke him more explicitly into his agentive self.

I also sought to bracket out moments of shared play in the mathematics. I had not been previously surprised to hear that Matt had had a history of always preferring to keep his unpolished cognitive work “under wraps” as Sonia had put it (December 14, 2009). This continued to some degree, though there were exquisite exchanges of shared play in

mathematics. To my mind, I wished him to play more. Still, under the weight of imposed anxieties, that we could play at all was momentous.

Psychoanalytic theory joins neuroscience and cognitive psychology to reiterate the pivotal function of verbal formulations of concepts in bringing otherwise inaccessible experiences into memoried knowing. To participate in the collective creation of shared knowing and experience requires communicative ability. Whether termed nonconscious, preconscious, unconscious awareness, procedural memory, or unformulated experience, proprioceptive registers of internal and external environments that do not move through the constructing mechanisms of language, like dreams unrecounted, slip repeatedly out of reach of conscious awareness and in such moments of slippage fail in their possibility of meaningful connection to any already construed assemblage of knowing within and across individuals. Of this ephemeral, and largely unrecounted, unaccounted for present, at best a much less sophisticated residue remains to be projected onto subsequent encounters. It is thus that Matt had begun with a conflicted preference for stasis and resistance, however debilitating, that kept him in the anxiety-provoking familiar. And it is this habit that we were also able to disrupt in degree through the provocation of his presence.

The story does draw to a close, or rather an end for the purposes of my narrative. This last dialogue occurred just 3 weeks prior to his successful completion of Grade 11 mathematics. Subsequently, in September of 2011, and in my absence (I relocated to another province), he resumed mathematics class with his same-age peers for his Grade 12 year. He finished that the year with sufficient success in all his subjects to garner admission to the undergraduate program of his choice where he currently studies

Environmental Sciences. I prompted him to get himself over a rough spot and well along on his way in the world. What held and what reversions occurred, have yet to unfold.

How Can I Exist? Minimalist “Solutions” when the World Threatens

Chasseguet-Smirgel (1984) links perversion and creativity in that in both there is an aim to restore the lost primary narcissism of infancy. In both she asserts there is a desire to escape from reality constriction into a world in which our wishes would be satisfied. Rather than labeling an early developmental stage as “primary narcissism,” I hold that both perversion and creativity are co-created through early experience and continue to be reinforced throughout the person’s development.

(Lachmann, 2008, p. 135)

A cosmopolitan world of accelerating change is a world on the run and pressing individual and collective adaptation. Creativity gains value, and what seemed perverse yesterday is more likely to be assimilated into today’s new “normal.” Drawing from Rotenberg’s notion of “‘optimal operative perversity’ to describe the artist’s tendency to deviate from and to contradict a ‘previously held principle of organisation’ (p. 171)” Lachman (2008, pp. 133–136) develops creativity and perversity as shadows of each other: Like the childhood game of peek-a-boo, both invoke violations of expectations to surprise or disrupt, humour perhaps entailing a bridging of the two. We may well be in an era to value the audacity of would-be-violators for the maverick contributions they make in perturbing a system into considering otherwise, to grow quickly and, then again, perhaps too quickly. Indeed, learning that has come to, at least in popular rhetoric, value innovation, on balance, places adaptability ahead of strength, poiesis ahead of mimesis,

difference above sameness, distinction before community, the extrovert over the introvert.

Learning as doing oneself into being with the world can be thought an autopoietic act of coming into shared presence. Developmental and therapeutic psychoanalysis tells us that presencing is a co-occurring event. This field of research asks after the manner and degree to which a being, beginning in infancy, becomes present to itself with and through engaging a co-present pedagogical other who, in some measure of responsibility, gives reciprocating audience.

Not unlike the question, “If a tree falls in the forest and no one hears it, does it make a sound?” What is the role of audience in autopoietic presencing? Indeed, in what compensatory adaptive ways does a life move to learn itself into being when there are overtly shared experiences of an other’s presence? And what sort of fractured, conflicting, and absencing presence as self-pathology arises in those trajectories that we would deny? Indeed, to what degree can any “I” perform itself if not legitimately present to itself as being both separate from, and yet part of, an attending, assisting (*attendre et assister*) world, begun with a first attachment figure, as audience? (I am pointing here to the other as selfobject within self. We participate both as viewer and viewed.) Moreover, if the “I” is not thus present, then who is it who performs and on whose terms? What anxiety arises with the demand to perform oneself when the self that one is or might be, has experienced but minimal audience—that, rather than having been granted presence by an also present other, has experienced only other-construction? *If I am defined in terms of you and you allow me to define you in terms of me, then neither of our interiorities are*

given to exist. I think they call this, co-dependency, in common everyday discourses where we are all, so-called, dysfunctional. Sigh.

Cartesian, narcissistic, and mathematics anxieties can be thought to express the fear of violations to self-presence where one's sense of distinguishably-coherent selfhood is under siege for want of measuring up to an omnipotent, omniscient, inaccessible, judging Other. Performing oneself to an audience where neither self nor audience is intelligibly and recognisably present, one to the other, instates an anxiety of absence, of not existing, of denied legitimacy into being and belonging.

If pathology entails irresolvable but ever-assaulting ambiguities of being, then the requirement of performing oneself into presence according to the expectations of an invisible everywhere Other, would press a retreat to a self-pathology of minimalist existence. That is, the minimalist self copes with incongruence by denying or annihilating it and the self too. He or she excuses him or herself behind walls erected to deaden any din of difference and to mediate entrance only to those other's who are submissive to controlled construction. The refusal to allow difference is a refusal to learn and it conditions the self-imposed solution of solitude. In a fortified enclave the barricaded self engenders his or her own self-imposed siege to preemptively protect and defend an emptiness within as all that can be allowed to count. Thus, at the pathological extremes of minimal selfhood, lone presence-as-absence clings to a governing pretense: "I am the world and the world is me"—and exercising willpower over that world, dismisses breeches of conduct according to a disposing, dismissing, forcibly extricating logic of "not me." There is a little bit of "not me" in all of us.

Imposing Worlds

In tolerating the child's (or learner's) discomfort the mother/teacher processes its pain and frustration, thinks the thoughts, and returns them to the child/learner in a *manageable* [emphasis added] form. However, if the mother/teacher is not able to hold the child in mind, if she over-identifies with the child [and I would add if other factors in the structuring of her circumstance, past into present, make of her as preoccupied and anxious] she may either swamp them (by *giving from a position of complementarity*, an act of over-identification in which she and the child are assumed to be one), leaving them unable to learn to think their own thoughts, or abandon them, leaving them alone with the *unmanageable* [emphasis added] feelings and similarly unable to process their thoughts/feelings. (Bibby, 2008, p. 44)

How do we “manage” anxiety? It seems to me that some of the difficulty in getting to an otherwise has to do with the belief that we can or that we should.

The tragedy of minimalist selfhood resides, it seems to me, in its degree of apparent contagion—the strange way that the illness of compliance of which Winnicott spoke seems to create petty sovereigns in service to an everywhere but absent reigning “Other,” enacting constructed oughts and shoulds borne by the self and anxiously imposed upon others: Parents, teachers, therapists, and systems of jurisprudence, all at times complicit.

I am here concerned with teacher and am particularly interested in this etiology of selfhood as a means to understanding and alleviating pressures (embodied tendencies of self) as opposed to the solution of regulatory mechanisms of punishment, retaliation, and

self-erasure as control. Whereas things like laws, armies, and behaviourism (cognitive behavioural therapy as the treatment *du jour*) work in a top down way of quick enforceable results (force being the operative word) by essentially holding lids down on the pressure cooker of selfhood, till habits change. Psychoanalysis and complexity point us differently in education and parenting in approaches suggestive of the possibility of relieving some pressure. But, that might take a little longer, a little more trust, to allow a creative loosening of radical self-acceptance's possibility; that is, stretching, in all its myriad meanings of *tendre*, attention, intention, tension, and tenderness that permit the enfoldment and acknowledgement of other as me.

I do not imply any sort of trivial tenderness here, rather I suggest an ethics of “caring for” that affords presence, acknowledges the other, and attends to that other in a listening and witnessing stance. And though this suggestion may come to the reader as in the direction of empathy, neither do I confound it with secondary narcissism or purport to name some altruistic human characteristic at the level of the species. I’ve long moved past such over-simplistic renderings. Lachman, elaborating on Kohut’s self-psychology, describes empathy not as prescriptive for treatment. Thus, neither do I prescribe it for teaching in any trivial conceiving. It is not a case of the “therapist [or teacher] only need[ing] to be ‘immersed’ in the subjective life of the patient [or student], mak[ing] an ‘empathic connection...,’ and then communicat[ing] that understanding by “empathising” and all will be well” (2008, p. 49). What I imagine is more in the genre of what Davis calls hermeneutic listening (1996).

This manner of listening is more negotiatory, engaging, and messy, involving the hearer and the heard in a shared project. “Hermeneutic listening’ is an imaginative

participation in the formation and the transformation of experience through an ongoing interrogation of the taken-for-granted and the prejudices that frame perceptions and actions. (p. 53)

In hermeneutic listening each listener, as shall be developed, is present giving audience to the other. Moreover the conversation's happening—playing as speakers do in and through language, but also with a shared cultural artifact, for example the discipline of mathematics—must also invoke a third audience of the collective we. This is the interrogation of the final chapters.

For now, return to Matt, the converse situation, and the problem of the construction of the other in manner as to speak over, for, and of that other. Such speech acts effectuate a denial of that other in as much as the constructor presumes to know better, saying in action that the learner can or cannot do. And I am hard pressed to know which is the more damaging construction: To insist on the child's infallibility may inflict a greater harm than charging fallibility. This is because, though either direction is a construction, the former tempts child into façade while the latter, at least, might provoke rebellion—which is a kind of ownership of self though still in terms set by the other.

Either way, by imposing our desired reality upon learners, are we not absolutely denying theirs and with it their presence? Moreover, if they insist on “can't” as a door closed to them, if we refuse the insistence, if we deny the closed door then do we not make of it a locked one because one cannot open something that is foreclosed from the start, that doesn't even exist? Better to say, to mirror back if we can: “Yes, I see that the door is closed for you. How awful. What shall we do? Are there other doors? Maybe this door will get lighter to you as you develop strength.” The point is that we cannot deny the

door is closed, nor can we open it for the other. We can only be with them, give them audience, in their experience so that they can be with themselves.

A ubiquitous doing for the other where that other is positioned to do or learn to do for him or herself bears the markings of an enacted form of not trusting that masquerades as caring while naming the other not trustworthy. Moreover, saying the other “can” (denying their reality) and saying the other “can’t” (overcaring) work to construct that other. Both arise out of distrust and a consequent effort to control, of a lack of belief in the other, a not listening, and a refusal to give audience. Such acts upon another work against the learner’s coming to terms with their own presence. The minimalist self is in some sense, absent as a demarcated permeably-bound self in and with world. As shall be explored, such minimalist-self tendencies beget those same tendencies in the persons we are wont to construct.

I believe the constructing situation is non-adaptive in that it sabotages growth and fuels anxiety over an uncooperative world. It presses pretense and pretend—not usefully and safely, not as in make-believe, where the world’s final words are held at bay, where there is room to play in the difficult, without threat to presence—but pretense and pretend as a believed, constructed, blinding, deafening fiction-become-virtually-real, rallied as lesser of evils to defend against psychic equivalence where monsters are real and the insecurities and mistrust of a hidden, covered-over self and a terrifying judging world are indeed the case. Rather than play in pretend to know the fictions of the mind’s creation, a minimalist self learns to dare not look inside that self, dare not risk findings within, much less accept that which has been safely projected outward. Yet it is in play, youthful childhood play (and possibly in adulthood, returning and attending, mindfully so, to that

unfinished work of play) that we risk getting to know the otherwise disavowed and disallowed remnants of self. It is in enfolding one's difficult knowing—notably through the gift of a presencing other able to give accepting audience into belonging—that we may ourselves learn to give grace inward, to allow miss-takes, and to risk being, knowing, and doing “wrongly”—even and especially as defined in the face of diffusely oppressive, singular dictates on right being, right knowing, and right doing.

I have heretofore invoked my narrative with Matt not as exemplary of anything perfect, linear, precise, or even the budding of technique. It is a muddling through with a sensibility of respect for a person, a discipline, and the possibilities inhering therein. It is a narrative of giving audience to a self and a subject discipline as best I might, on that self's and that discipline's own terms and not some inaccessible Platonic ideal of using the former to measure the latter. The story is offered as hermeneutic window to a pervasive issue of absent trust in self, in the other, and in the capacity to learn, be, and become well with other in the world. It addresses the consequences of learning that is regularly circumscribed by an insistence, after-the-fact, of orderly construals of knowing—learning at odds with the messy, unordered, non-linear cognitive work of conceptual formulation. And finally in some way the play in the mathematics was a play through anxiety into the stillness of something beautiful and reachable but never quite there.

Baldino and Cabral write:

I recall that when I was little, I was afraid of the dark. Instead of leaving a dim light on during the night, my mother used to take me in her lap and walk with me across the room, asking me to touch and recognise objects and shadows. When I

grew a little more, I enjoyed myself playing this game alone.... What we have to do is to reopen the situation that produced the anxiety and support the subject in redressing his/her dealing with the Other's desire. (2008, p. 72)

Baldino and Cabral describe what I believe I know how to do and have done with one young learner. But it is another matter entirely, I am supposing, to prompt this curiosity of "feeling ourselves in our world in the dark" at the level of the cultural collective. Moreover, how do we open up such possibility in future teachers, and older learners, where minds have crystallised and boundaries have solidified? This is my curiosity: My desire's conditioning question. And yes, there is *jouissance* in this work.

This issue of anxiety resides not only at the heart of Matt's challenge. His situation is metaphor and self-similar fractal instance of a greater problem/challenge infusing the present whole of humanity's being with. Each new moment and place, *kairos* and space, entails a difference that is its own possibility even as it carries forward the collision of shared originariness of you and I and us. This crisis of anxiety in Matt, is the same anxiety, out of a same originary source infusing all of us. I wonder, at times, if our sense of its rise in presence and oppressive force is merely a function of "more"—explicitly more humans, for whom that collectivity of moreness threatens to suffocate a courage and an opening for a courage to be present to ourselves and others.

In any case, the desire to manage anxiety out of sight, but never out of being, seems to characterise a present relationship with learning—individually and culturally. We have less tolerance for mistakes, leastwise at the larger collective consciousness level. Yet, however hierarchically "up" these things exist, they have a way of insidious

sedimentation into beings: Organic parts and whole, enfolding in and unfolding from each and other, as they do.

Would it be possible and, if so, how might it be possible to conceive and then to enact a conception, up and down, of the unmanagement of pedagogy and the unmanagement of curriculum? Could we trust enough to let go of Promethean successes at “willpower” or must the collective angst spiral to a level of out-of-control control? If a child might be brought closer to knowing a self-otherness, in trust, through attuned mirroring, can a world? How would that look? Do we need a “God” or an omnipotent scientific method to crown its legitimacy upon an institution’s containing and mirroring function? We have seen each break down.

What does all this come to mean, in any practical sense? I think, at a minimum, it translates to understanding an experience of bewilderment and threat of exclusion for the student unable to make instant sense of mathematical givens and a counter-experience of competence and comfort of inclusion for those who leap to understanding. This is the parsing of selves into can and cannot do. Mathematics bears the markings of omnipotent absolute knowing, where there can only be one right answer to $2 + 5$. When one chooses the correct way, one is graced by its privilege.

We cross-multiply to solve for x and the magical means by which the “answer” falls out demonstrates the power of mathematics. “No mind” that the question of why is rarely posed, much less grappled with. If there is a why, that why will be dictated too. It is always given with the lights on, not explored in a shared darkness. Why bother groping and playing the game of sense-making when being told is far more efficient? And so, the Cartesian mirror of mathematics fails to contingently re-present any possibility of a self’s

existence, of curiosity and desire, as particular and uniquely made through creatively-understood senses in world.

The point is also that any self, construed as an apparition, supposedly in the image of another more powerful bearer of legitimising credentials, installs a life task of living up to that which we are not nor could ever be. It is not a life task of deep integrity with world but one removed from grappling in and with world as intrigue. If we are to aspire to any kind of agency in the world, on omnipotent terms, petty sovereign seems all we could aspire to—but petty sovereigns are flogged too, are they not?

Deemed good-enough as petty sovereign, in the stead of an omnipotent Other, is the promised afterlife-reward enough? In any case, in this world, we are given to not act on our own behalf, for to do so would name ourselves narcissistic and to enact the audacity of rivaling the purveyor of all being. To my mind that would either make of us a Lucifer, or in our humanness, only give of banishment from Eden. In short, in a Cartesian virtual reality become real, there can be no “I” to exist—a life lived must be endured in the angst of a constant erasure even as we struggle to emotional being.

Must it be thus? Can we educate ourselves in ways that interrupt a cycle of pathological anxieties, Cartesian, narcissistic, and mathematics? I believe so. Just as pathology seems to beget pathology, so too with wellness. And though we may feel that we are heading in a direction of deepened pathology, like the plane that never points directly at its destination but rather veers this way and that, subtly honing in to its approach in self-adjusting manner, so too may we be. The middle path is *off* the beaten one, and hardly straight as it weaves between structured histories laid to either side.

8 Between the Given and the Made

I had had the idea... that *there was something being left out of the system [of education in schools] and that it was something to do with the problem of psychic creativity* [emphasis added]; but that is also the theme of Blake's illustrations.

Thus I have come to look on Blake's *Job* as the story of what goes on in all of us, when we become sterile and doubt our creative capacities, doubt our powers to love and to work....

Freud was also concerned with the story.... He discovered that, in a setting in which it is understood that a person can, as far as the listener is concerned, say exactly what comes into his head, without bothering... whether it makes sense, then what he says will gradually be seen to be making a sense of its own, a hidden sense that the person had never guessed was there. (Milner, 1956/1987a, p. 169)

Anxiety, and Play, in Unresolved Ambiguity

We have travelled quite a distance since Chapter 1. Just as Milner describes, I have been working a nebulous creativity into something worthwhile—*I trust*. If you are still with me, I do thank you for the gift of your audience, and I do apologise for trying the kindly patience extended my way. Indeed, if you are still with me, I expect that in some sense I must be “preaching to the converted” for the audience given.

I admit to having been engaged in my own dialectic of autopoeitic becoming—laying forth in some crude semblance of ordered resolutions, a rather large gathering of contemplations. In terms of the model that I will present in this chapter, I dare say I have already engaged you in its play and it behooves me to pull a centripetal sense of that

which may have come to you as ambiguous and without direction. Like Benjamin, though it may not be yet readily obvious,

I am fundamentally a centripetal thinker... trying to pull everything back toward a center.... I go “outside” to the manifold to bring what I find “inside,” to connect with and recognise myself in others I read and know.... I realised that I am always trying to straddle and bridge opposition, to find an underlying thread that ties together disparate things, to turn the many into one without reducing or dedifferentiating. (2005, p. 188)

You have suffered much from my outside gathering: Acting as hermeneutic window on a much larger problem has been the story of one anxious mathematics learner. Has that story been lost in the myriad tangential excursions, or can all be pulled back together? I assure you, my experience with Matt, which is to say the meeting of his experience and mine in world, has indeed been the motivation through which and in which I have traversed the contents of these chapters and beyond: an educative challenge of mathematics anxiety, a philosophy of singular plural being, the physiology of e/motion, a how of bio-social development, the conditioning of Cartesian and narcissistic anxieties, and the demand of modernity to perform. You have been privy to my seeking. The question remains as to whether I have reached too broadly or lingered too long in the play of contemplating illusioning and disillusioning moments—grandly, audaciously, and perhaps too abstractly so.

I voice these concerns because they point to the very thing I purport to study. For surely, I have rendered you, the reader, anxiously wondering about the sense in the “nonsense” of this other’s, my, seeming lost direction. Did I know where I was going?

And why was I not clearly marking the signposts? Merleau-Ponty comforts me my wandering: “Personal life, expression, understanding, and history advance obliquely and not straight towards ends or concepts. *What one too deliberately seeks, he does not find*” (in Stern, 2003, p. 25).

I too suffered the same ambiguities as given, but with a twist: In general, though I knew where I was going, I did not know where I would “end up.” I had to get there first. That precisely is the point of play, the overriding character of learning, and the anxiety-provoking challenge of schooling outcomes as “deliverables.” And so, the degree to which this narrative coheres from the outset may well be the degree to which it is a fiction delivered, as “on cue” as I could muster. Its organisation, its orderliness, or what little exist, is evidence of my trying to structure away the anxiety that my journey engendered in the journeying. For, in truth, in daring creativity’s dialectic ways, we do push at the edge of risk, trusting to recover ourselves on some kind of reassuring other side, in enough control, if only temporarily so.

This chapter then indulges one last set of musings to think with. I posit a dialectic model of autopoietic becoming as a kind of centripetal force through which to make sense of learning and the contexts that have brought us to this point in the dissertation. The model, however, describes learning in ways that also call into question trust and control—and as it turns out, trust and control become pivotal to holding together any discussion of anxiety. Lest there be any confusion however, I begin by emphatically stating what I believe (and hope) that this model works to dislodge:

“All children can learn; Failure is not an option:” Witness two popular platitudes masquerading as aphorisms to define the conditions of schooling today. That these

continue to proliferate in educational discourses is, for me, bafflingly discouraging. The first carries a most disturbing presumption that for learning to be learning it must “count” in right ways. Let me be clear. This is adamantly not the meaning I take. If children are alive, as are amoebas, then yes they learn. Indeed, by definition, life forms do learn. This is the essence of describing life as autopoietic. Even if I elide into a sedentary life style, among other “learnings,” my muscles will indeed self-adjust into atrophy as accommodating gesture. I cannot stop myself from learning. The point of the previous chapters is not *that* we learn, but rather to attend to that which moves us and the processes through which we move to this or that particular learning—where learning is indeed self-change in and with world. All of which brings us to the second platitude.

To suggest that failure is not an option, is to make of failure a monster while forestalling its cresting inevitability. For the *non*-omnipotent of us, failure must always be an option: Indeed, *that failure be self-annihilating is anxiety's overriding concern*. The very option of failure sets the boundaries of any present possible, while defining a direction for expanding that possible. The more pressing question then is not whether failure be an option, but rather which failure, as in which learning, is deemed to count. But such questions are not the kind that people sending their children to school seem to want to hear—leastwise that's been my experience. Schools are given to know what ought to count and should ensure that all children can and do learn it: This is the subtext of the statements: “All children can learn. Failure is not an option.” And yes, that ever present subtext, most certainly continues to trouble me deeply and profoundly. What I might do about it lies in a future that I as yet do not know. Each path is laid in walking. For now consider learning.

A Model of Learning

What triggers the opening of one's mind to new knowledge, to enter a joint domain of common focus and interest? To make use of the other as an extension of self-experience, the other has to enter an implicit Hegelian dialectic as suggested by Winnicott (1956/1987a) and emphasised in Fairbairn's object-relations theory (1952 in Fonagy & Target, 2007, p. 416)—doing so by temporarily abolishing the boundaries of self in order for the other to find himself within.

I move a consolidating chapter thus, in manner to return us to a conundrum of marking “beginnings” but also by way of introduction to a visual model of a dialectical process, illustrative of ongoing becoming into and with one's singular plural being. I write of illusion and disillusionment because I draw from Winnicott's interpretations of these notions, but also because neither illusion nor disillusionment suggest a place we want to stay transfixed. This too reminds of a sensibility that Lacan named in desire and the lack—both of which come to me, happily it seems, in ample supply. And so we circle round and in the circling, I do experience something I think of as *jouissance* as that pain of too much tenderness. Indeed, it is not pain, but stoppage and backtracking and the loss of desire's lack or the threat thereof, that counterpress me as anxious. Oddly, I think somehow that is why I have no desire to purchase a lottery ticket—out of fear that I might win.

The other day, I watched a leaf drift to the earth and imagined myself spent and returning thus. The image of my mom's final hours, burnt into my memory only months before, rest in me. And it occurred to me that I would be glad for that recursion into earth's reposing decomposition—that new assemblages might arise forthwith. The

thought surprised me. I relate it here because I sense it has something to do with Freud's pleasure principle and the death drive, but that is a matter for further circlings, post-dissertation to be sure.

I find myself fascinated at the seeming resistance in language to the oddly conjoined opposites of illusion as against disillusionment, the latter arising from a supposed interruptive real. I imagine self-illusions in terms, not of phantasy (though surely having their inception there) but rather illusion as recursively-elaborated, self-made coherences of those things admitted in, to, and by the self. Such coherences will have begun in first life interactions, these co-emergent along a gradient into ownmost being in response to and with the giving prompts of uterine ecologies and subsequent neonate experiences in world. I consider these tentative founding bodies of self, after the manner of Butler's contingent foundations (see Chapter 3; 1992), as constitutive of marked-as-beginning places upon which we subsequently construe ourselves, dynamically so—bound but permeable and adaptive to the world we conceive and perceive into knowable and known existence.

At the same time, our ecologies act upon us—paradoxically if we are to take the literalness of Maturana and Varela's notion of structure-determined systems—with a force that extends past and into the limits of our boundaries such that we perceive of their prickling perturbations. In as much as our boundaries are thus breeched and a perturbing difference disturbs present self-coherences—which is to say all of the time at some level, owing to our existence as energy transducers of a sort operating always in far-from-equilibrium states: We step to re-equilibrate our coherences according to three possible gestures, near as I can tell: (a) We can learn, which is to say, change ourselves to resolve

the newly experienced ambiguity. This I enjoy, ultimately, which is likely motivation for seeking out incongruences—purely for the heuristic pleasure of feeling myself sense-make another time and the world change through new eyes. (b) We can move to change the world we inhabit either by literally relocating or by imposing our will through force or persuasion. In other words, we can press the world to learn that which we are wont to teach it. We can conquer and/or proselytise. (c) Or we can diminish the permeability of the membranes that surround us, putting up walls of various sorts. Now all of these things I mean in manner of literal physicality, as possibility through all levels of complexity, but also as embodied psychic and discursive being, these likewise expressive of and bootstrapped to physiology at some deeply embodied resonant level. So, for instance, a bacterium can put up walls and become dormant until such time as a suitable ecology becomes “known” to it, triggering its awakening. Or we could speak of a culture or a person “circling the wagons” to preserve the within from the without.

Although I speak of a perturbation given, seemingly, of an external ecology, we can at the same time, and with like frequency and intensity, I believe, speak of a perturbation from within, with variations on the same resolving attempts, the difference being an altered viewing perspective; that is, we shift from the view “up” of the individual agent to the collective, to that of the view “down” of the larger collective perceiving the perturbation as arising out of its comprising individual agents. Like a pearl “licked” into isolations, so too can the adaptation be a greater boundedness within. I could detail how these various scenarios might play out, but I have already been engaging in far too much detailing and it behooves me to get to the point, or rather the points I am trying to make.

In all of these instances, perturbations received, that is to say admitted and felt at some level, constitute potential disillusioning moments where disillusionment disrupts one's current knowing and presses a difference that asks either to live and manage the fragmentation of self, or to refashion oneself in manner to resolve the ambiguity into a revised, more expanded, illusive coherence, if one can be conceived. What I am describing here is every bit the notion advanced by Thomas Kuhn (1996) when he introduced the idea of a paradigm shift, but I am considering that shift as a characterising quality of all learning systems, not only the discourse of science that rides atop human collective activity.

The trick to learning well, if there be a trick, entails in negotiating self-change on the fly in manner that is adaptive. That said, such self-change, where it involves paradigmatic change of the poietic sort involves some loosening of existing structures. It therefore invokes, at first at least, a moment of weakening and threat to the system. One does not loosen one's means of holding together in the face of something that portends to pull one apart. And so an injured muscle does spasm. It does not relax, unless of course we sooth with heat. The response to a perturbation in the circulatory system is a bruise, a clotting, and a constriction. And the psychic response to threat bears all the metaphorical and literal markings of the physical body.

The other side of poiesis is mimesis, which entails entrainment and the tiered bundling of like forms that builds power through increased acuity and synchronicity of, at the level of persons, neural firings. mimesis as copying and strengthening is the gesture of learning in the direction of certainty and suits stable ecologies where resilience is not the commodity "du jour." Both mimesis and poiesis are fundamental to development.

Both beget neurochemical affective reward in humans—positive emotions with feelings construed dialectically upon and with such emotions (see Chap 4). That said the mimetic gesture is to self-fortification in effortful response to familiar stressors. Accordingly, in effortful practice one becomes “better” at that which one practices. In contrast, the challenge of the poietic gesture inheres in reconstruing after disassembling. That is, the creative poietic gesture begins with a dismantling of structures such that new assemblages can be creatively construed. If sense-making is that which is sought and fluidity of choice is the desired outcome, then the poietic act, however unpredictable, is most prized.

Thus, we have the pieces of a conundrum—an ambiguity to be resolved: In the present era of rapid change, where creativity and adaptability are highly prized, present stressors that press systems to align and bundle—in near military unison or in retreat to abject zombie-like amorphous assemblage—quite simply won’t do. The more we demand creative sense-making, the more we press anxiety and condition creativity’s impossibility. It is here that we run head long into problems of control and trust and the role of structures in managing that interplay. The way of mimesis is the way to strengthen illusion, to refuse ambiguity and a particular kind of learning—the learning, it would seem, presently most valued. It is surely no surprise then that we find ourselves in an anxiety-ridden age of minimal selfhood.

Consider then Figure 3 below. I offer it as my favoured present “illusion,” potentially generative of fecund sense-making possibility. I make no claim to any absolute knowing here. I offer it only as a pointer to think learning in these terms. The image narrates a recursion such that each cycle returns not the same made illusion nor

faces the same disillusioning given. On the side of illusion is consolidation, as meaning assembled through the sense-made of an ambiguity resolved, the “a-ha” moment that immediately reduces cresting tension and with it anxiety. On the side of disillusionment is a perturbation, a difference, a “huh?” possibility of noticing incoherence to interrupt precious illusion’s story. It is disillusionment that announces the failure of one’s lovely knowledge. It is disillusionment that can discourage, but it is out of disillusioning forces that we are pressed to grow our difficult knowledge into more embracing illusions as workable reals.

Figure 3. A dialectic model of learning as autopoietic becoming

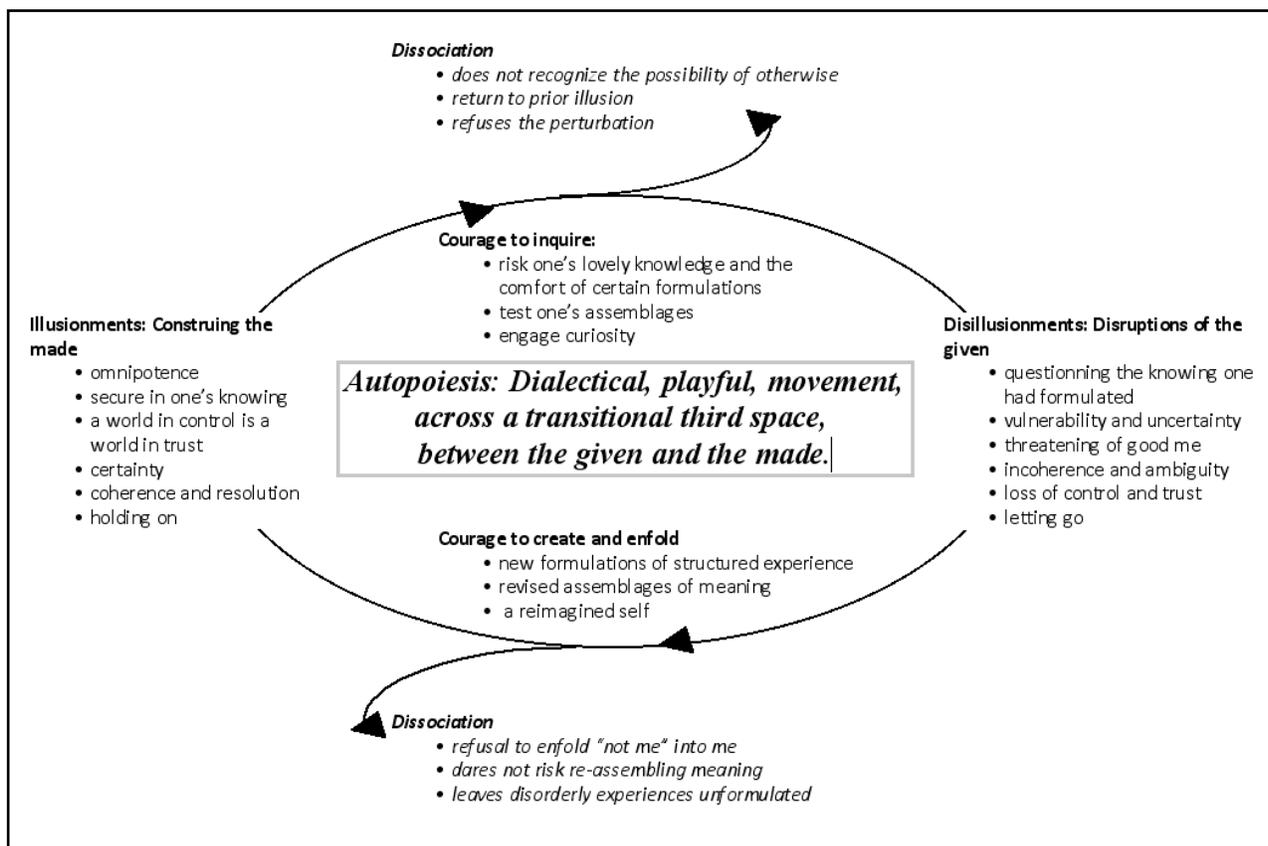


Figure 3. Recursion in learning: An expanding cycle of sense-making occurs in movement in the spaces between structures, from given to made and back round again.

I have been gratefully influenced by the work of Donnel Stern in the prompting of this model. Situating the verbal in the nonverbal and describing language as “the very crucible of our experience” (2003, p. 9), he explores understanding as shaped across dialectics of past with present, the given and the made, and Milner’s “me-yet-not-me” (1952/1987a). Understanding for Stern is “inevitably a matter of selecting and formulating one interpretation from the multiple plausible alternatives in any given situation” (p. 208).

Whether in a social group or in an individual, human life always involves a continuous dialogue between the possible and the actual. A subtle mixture of belief, knowledge, and imagination builds before us an ever changing picture of the possible. It is on this image that we mold our desires and fear. (François Jacob in Stern, 2003, p. 4)

Winnicott’s paradox of the transitional object as between the given and the made¹²⁴ works this ongoing dialectic between “what we *can* make *now* [the possibility of the present] out of what we *have* made *then* [the given, now embodied in the present]” (Stern, 2003, p. 4). This very notion resonates with the possibility of a fecund teaching dialectic between safe-enough spaces for indulging the creative potential of illusion-making (on the part of the selves involved, student and collective) and the disillusioning use of a given interruptive reality inherent in the contingent foundations thus made. That

¹²⁴ As made, the transitional object becomes meaningful and cathetic through mechanisms of projection and identification. Something of the baby and the mother, as extension of the baby, become signified and located in, for example, the security blanket. Just as the baby relates to the blanket as made, he or she also uses the blanket as given. “The object, if it is to be used, must necessarily be real in the sense of being part of a shared reality, not a bundle of projections” (Winnicott, 1971/2005, p. 118). Thus the essential feature of the paradox of transitional objects is this: “the baby creates the object, but the object was there waiting to be created” (p. 119).

dialectic is engaged in conversation through language. Indeed, language is the vehicle of its movement.

The given and the made in psychoanalysis refers to “what we find preconstructed and what we make from it” (p. 6). Stern’s insight is to conceptualise the movement of reflective experience that engages preconstructed materials, which is to say, that takes a perspective on them—that interprets. The heuristic moment characterises “creative interpretation; cliché is trivial, uninspired, or conventional interpretation. But even the most commonplace and familiar experience is interpretive or perspectivistic activity” (p. 6).

Much of everyday life, often seems given beyond our power of words to express (though notably still within a world constructed by and delimited through words). “Over and over again... we have the compelling feeling that meaning is emergent and incomplete, the sense that experience melts and verges into words—and escapes them” (Stern, 2003, p. 16). Stern joins other thinkers to name these “‘feelings of tendency’ (James, 1890), ‘felt meanings’ (Gendlin, 1962, 1964), ‘tacit knowing’ (Polanyi, 1958, 1959)... [as] the only direct manifestations of ... [nonverbal unconscious] phenomena that we can perceive in our verbal, reflective mode” (2003, p. 16).

Importantly, Stern explicates unformulated experience as that fertile nonverbal world of our unconscious immersion. Considering the illusive imagery of private not easily grasped vocabularies of fantasy, phobia, and dream, as might be expected, the desire to know about the unconventional within us is uncommon. And, even if one desired to know, the incommensurable modes of representation make the translation rather like trying to catch a rainbow. For all that is conventional and unconventional,

beautiful and bizarre, in unformulated experience, its combined illusiveness and potential volatility ensure that “we never finish *envisioning* anything that matters to us, any more than we ever finish *saying* it” (Stern, 2003, p. 22).

Across and between moments of illusioning and disillusioning, are experiences left unformulated. “Understanding is an act, and it is easier, less effortful, not to carry it out than to carry it through” (p. 76). One can cling to one’s illusions because of their comforting coherent sense. One can refuse to look, refuse to know differently because knowing differently would threaten the who that one insists on knowing oneself to be. Stern develops that two forms of dissociation repudiate uncertainty in favour of a predictable given. And it seems to me that both forms characterise the ethos of modern schools. If, “to be curious requires the toleration of uncertainty” (p. 77), how then can we construe classrooms as places for being curious, for opening up and exploring the possible, and for engaging the messy, effortful, often unsettling work of meaning-making?

Caught in the undertow of a cultural pathology of conflicting narratives, dissociation in the weak sense is understandably a recourse for refusal to risk formulating one’s own sense. According to Donnel Stern (2003), dissociation in the weak sense describes an adherence to present trusting structures seen as “in control”; that is, it entails an out-of-hand dismissal of any competing narrative that threatens the comfort of the story one knows. Dissociation in the weak sense or *narrative rigidity* names the “invisible interpretive predispositions that represent the shaping effect of culture” and that foreclose the ability to make meanings differently. They are the sense captured in “turning a blind

eye” and such aphorisms as: “What you don’t know can’t hurt you; Better the devil you know, than the devil you don’t; and If it’s not broken, don’t fix it.”

In Lampert’s work narrative rigidity seems to better characterise those students she describes as adhering to “nonmathematical ways of knowing mathematics in school” (1990, p. 55) expressed in the following responses to the question “Why?”: “Because that’s what Tommy said, and he’s usually right” (p. 56); because that is what the rule says (p. 56); “I just know.... It’s none of your business or anyone else’s how I got my answer” (p. 57); and it’s right because “it’s my way of doing it” (p. 57).

It takes courage for a learner, conditioned to believing that to count one must know right answers, to expose himself to being wrong, to allow the perturbation in. One dare not step outside given structures for the uncertain messiness of what might happen there in the spaces—even less so if one understands the learning situation as not really learning at all, but rather as producing oneself in the face of a demand to perform pre-determined measured and measurable outcomes. Under such circumstances, where any space between the given and the made is foreclosed from the start, it would take quite the trusting environment indeed to prompt a learner to risk being found or called out (as Matt phrased it).

On the second movement of the learning cycle, if the learner must indeed admit the perturbation and experience the disillusionment of what he once understood as a suitably made coherence by, of, and as self, the feeling may well be one of frightful freefall, as in a dream, where one feels beside oneself, dissociated, and watching as if from a distance. Stern describes dissociation in the strong sense: It is a condition he terms *not-spelling-out*, where one prefers the familiar chaos of unformulated experience and

insists against the process of thinking itself. In so doing, attention eschews “feelings of tendency” such that an “autistic certainty of parataxis” freezes the possibilities inherent in indulging “creative disorder” (p. 76).

One could imagine the feeling as akin to having inadvertently, or even voluntarily, let go of one trapeze and finding oneself so traumatised as to deny trauma’s very conscious presence out of formulated reach—preferring instead, diffusely felt anxiety. The experience of finding oneself bereft of the certainty that one thought one knew—in a world that anticipates, expects, and will measure that knowing—installs an intolerable experience of profound failure and presses a fragmented exorcising of the unworthy, failed, bad self. Under such conditions of irresolvable incoherence of good with bad me, the survival response is surely to announce if not me, then you.

I do admit these feelings and witness them in others: I must steel myself to hear criticisms of my writing or my teaching, because both are works of love. And yes I do respond initially with both a wave of disappointment in myself, then fear, defended against by swelling outrage as I look the thing and the criticism in the eye. And after the dust settles from all my protesting commotion—sometimes on paper, sometimes silently hurtled, sometimes in dreams—I reach a quiet place of courage to give myself and the “accuser” grace. It is difficult work but I do learn myself into a new difference and the cycle begins anew as I feel myself “more well” for the battles raged, the tears shed, and the new senses forged.¹²⁵

¹²⁵ I wonder if this process gets more or less difficult with age. Is self-crystallization inevitable or can one grow resilience? Perhaps the thing one learns better is how one can be wrong and still both right and good enough. Time will tell.

In any case, I can and do imagine the considerable anxieties under conditions of facing disillusionment yet another round. Yet, it is in the disillusioning moments that nuggets of a new possible, a new illusion, are seeded. It is here, that creativity is most wanted and yet most heartily shut down. And, it is here where a safety net in the capacity of Winnicott's holding environment may well be most treasured gift, as perhaps exemplified in at least one accepting other, able to bracket away the preemptive demand to perform, and instead give gracious audience when the learner struggles to muster presence for himself.

Crucially, within the seeming nonsense of unformulated experience as "content without definite shape" (p. 39) inheres the creative possibility for the shaping and articulation of meanings that can be effectuated, but neither forced nor controlled, in the "wording" of the ephemeral. As "the sum total of all the knowable, communicable implications that have never been spelled out, perceptions that have been habitually passed over, and so forth" (p. 44), and as "the moment-to-moment state of vagueness and possibility from which the next moment's articulated experience emerges" (p. 44) unformulated experience contains the disorder that belies the mind's fertility—the condition of its capacity to think otherwise.

As students move through ever-expanding and ever-deepening senses of mathematics, how then might we engender safe-enough curricular spaces that assist in the psychic negotiations of alternating illusionment and disillusionment that is the coupled pain and exhilaration of growth? What is the appropriate posture of teacher as both student of co-emergence and cultural guide, conversant in the curricular labyrinth? And if learning entails autopoietic negotiations of an interior self with, in, and through an

exterior culturally/linguistically-presented and psychically-encountered virtual real, then how might the teacher, as analyst, co-participant, and conscious prompter, orchestrate a sufficiently provoking, yet safe-enough space of curricular play?

At the risk of oversimplification, and aware of the teacher's own structuring complicities, perhaps we could begin with a pedagogue able to say something on the order of, "Yes, indeed, play. Here is a possible script from the world with which you might play or against which you could improvise. Try yourself, and recover yourself anew. Go ahead, get dirty where you will. If you are unsure, see, watch me. Watch all of us. We trip. We fall. And yet the bruises heal and we get stronger and more resilient. We find, together our way back to our feet again so that we can dance. And even if we do or we don't, that is no measure of the worth of us, rather we are in this together, playing and working at sense-making that matters. So tell me, how can I help you become yourself as better with the world?"

At the core of self-possibility and self-making with world, of becoming in singular plural being through cycles of learning, are questions of trust, self and other, especially in order to dare leaps of faith into the dark unformulated places outlined by structures in control. I turn therefore in the remainder of this chapter to considerations of trust and control in the fashioning of safe-enough places for creative emergent becoming as real-enough possibility.

Dynamic Structures, Their Shadows, and Possibility

Bed bugs are back, more resilient than ever. DDT would not completely eradicate them. Who knew?

I misplaced my keys. I misplace a word. Giving up the systematic search, both “turn up.”

Generations of small scale farms, worked in “‘marginal’ agricultural environments” have become “repositories of wisdom... unquestionably... the most important sources of biodiversity on the planet, a storehouse from which plant breeders draw to adapt all crops to changing insect pests, plant diseases and climatic conditions” (Boyce, Rosset, & Stanton, 2007, pp. 141-142).

These three examples of unanticipated emergences come into being “despite” and “because of” the controlling impulses of structured and structuring systems. In each of the above instances, unpredicted newness percolates within and precipitates out of the limiting outlines and delineated markings of the very structures whose design seem intent on obliterating novelty’s possibility. Out-of-surveillance, in the shadows and counter-spaces of structures—the likes of sterilised environments, memoried mind networks, and large-scale world farming practices—creativity forges a presence. Must it be so? What might come of thinking possibility with and because of structure and, accordingly, trust with and because of control. If in the above examples, we consider DDT, methodical mental searching, and systematised constraints on farming practices as instances of structures meant to control—but whose controlling enactments can never fully constrain—then how might such thinking inform an understanding of the inevitable play in structure: play within which difference, uncertainty, and choice exist; play, the possibility of which, ultimately requires trust, that leap of faith to suspend fear of outcomes-gone-awry? Is it wise to count on, to trust, play for the unpredictable difference it can make? On the other hand, not wanting to leave some outcomes to chance

(presuming we have a choice), do we implicate ourselves in a game of conditioning the particular differences and play that we think will achieve the ends we desire? How much can we, dare we, structure or control the spaces where play is allowed? How broad or narrow must the lines and spaces be?

Speaking metaphorically both for and against our seeming desires: Can we expect weeds (likened to bedbugs) to relentlessly press an unwanted grip into cement? Conversely, dare we trust that there will always be, analogously speaking, plants (the likes of innovative small farmers) to wedge roots and eke life out of cliff-faced existences? Indeed, how much can we predict in advance which plants should be called weeds and which not? Ultimately, can we learn a better wisdom for navigating the apparent certainties of structure but at the same time appropriately letting go systemised assurances in favour of trusting nebulous leaps-of-faith to as-yet-unformulated possibility? In short, given whatever historically-structured conditions have come to settle in present systems of embodiment, considerations of emergence implicate a question of trust, in particular, trust in both the embodied and embodying structure-determined systems and the ongoing forces of life's inherent wisdom—these weighed against the changes we, from our limited purview, might wish or think we can engineer.

Can we think in terms of structural mitigations of certainty and control as affording the very ground to condition and cue, in good enough¹²⁶ ways, life's dynamic ingenuity as adaptive self-creation? I pause here to explicitly set forth certain biases: I do not for a minute believe that any measure of training, scientific construing, or otherwise informed and enforced procedures could have pressed bed bugs to adapt, my mind to

¹²⁶ Here I am referencing the notion of sufficiency as characterising good enough adaptive fit in terms of non-linear dynamic systems in their environment.

heuristically assemble the thought or attention I consciously wanted from it, or various collectives of humans around the globe to develop ingenious approaches for growing diverse crops particularly suited to local conditions.

Yet, what if the thing we want to emerge seems too important to be left as chance emergence? How can we trust and condition possibility under such constraints? How do we let go enough, but not too much, especially when the thing at issue is not so trivial or replaceable as a lost word or a missing set of keys?¹²⁷ And of course, here I am speaking about the education of a society, a culture, and the practice of governing that education. And I am also speaking about Matt.

Like the examples, these questions bear relevance at multiple dynamic levels from micro- to macro-scales of life-space and life-time; that is, from the “present moments”¹²⁸ of day-to-day life (evoked in the example of mental searching) to socio-cultural enactments at the level of human collectives (farming example) and in evolutionary terms at the level of species (bed bugs). The resonances across these domains and scales afford storied reasons why, in multiple contexts, *we might have little choice but to submit to a wisdom of working in the play of life’s process*, of “trusting the process”—that process being the insistence of autopoiesis as unpredictable genius of life’s iterative and dialectic self-formation in and with a world. Recognising that this is not necessarily a genius confined to, nor that prioritises human life, how might such trusting see its mindful enactment in education. In so saying, I am categorically *not* advocating a *laissez-faire*,

¹²⁷ How do we trust and condition possibility, especially when schools are held accountable for so much—in particular, when schools are held accountable for people they “produce”? (see McClintock, 1971, p. 177)

¹²⁸ In Daniel Stern’s (2004) conception, present moments come to us as successions of heuristic, of-a-piece, assemblages of experience of duration 2 to 10 second duration. Our everyday trajectory of experience is a succession of such present moments with unaccounted for spaces of time in between.

anything goes, approach to teaching and learning. Instead I wish to highlight the local conditioning structures upon which and within which life forms—themselves structures in structures—are pressed to creatively and dynamically adapt. Here, with and in the very conditioning of structure, we as life forms, do and can wield our own autopoietic choices to partially¹²⁹ attune the circumstances of our own learning. We do so already, but very badly indeed, given the persistent, simplistic belief that the processes of autopoietic emergence can be technologically managed into sure existence. In the least, more-evolved, non-deterministic 21st century sciences like non-linear dynamic systems theory have something to offer: They can clean up after the misappropriations of tricks-of-the-trade of younger impetuous linear sciences and turn maturing wisdoms' gaze toward supporting that which the humanities have been saying all along: that attempts—technological, scientific, or otherwise—to control and dictate learning are impossibly-conceived at every level, scale, and dimension of enactment.

Following the advances of complexity theory, one can think the notion of structures (as cited in particular structure-determined systems of life) in ways that might work all the way up and down—from macro-planetary dimensions to micro-bacterial ones (Thompson, 2007, pp. 118-122) where autopoiesis is “the paradigm case of biological autonomy” and “the core ‘biologic’ of all life on Earth” (p. 44).

The structures with/in which we experience ourselves and the world entail an inevitable coexistence of order with disorder, certainty against ambiguity, form and its other. Learning as adaptive self-restructuring occurs within contexts of good enough because we can never arrive at a place where we've gotten “it” right (whatever “it” might

¹²⁹ Partially is used to refer both to an apportionment and to the bias of partiality.

be) in any absolute static sense. Yet, we do like order (and I am not using this term in any absolute sense, but rather from the perspective and scale of a human viewer). We need it as much as its obverse, disorder. We exist in, with, and through order. The particular order that structures our dynamic being might well be considered habit. Conceived across scales of existence examples of such habit might be: DNA replication, nerve reentrant firing, affect regulation, interpersonal communication, organisations of experience and perception, and custom. In every case, order dynamically structures existence as possibility as much as it affords a sense of controlled predictiveness. It does so even as it engenders in its wake, insistent disorder of unnamed, untamed possibility—a goodly consequence, entailing perhaps the ultimate trigger for learning. Even DNA, as it turns out, is prompted to selective enactment according to its environment¹³⁰ (see Jablonka & Lamb, 2005, pp. 47-78). Out of disorder (itself bound in and with control) possibilities find birthing places. Just as manure is both expelled discharge of life and rich humus of new life, so too, the nebulous and the ambiguous is as much fertile ground for difference as it is collateral damage of a compulsion for order.

Consider anew the phenomenon of trust-with-control. In a recent viewing of Canada's *Cirque du Soleil* troupe I found myself marveling at the tremendous amount of trust that these athletic artists must have, one to the other and each to themselves in regards the feats they perform. By the same token, one could describe their situations as characterised by extreme control.

¹³⁰ “The genetic system, like a score, defines the range of possibilities, and when this range is wide and many heritable phenotypes are possible, a lot of interesting evolution can occur through natural selection acting on these variant phenotypes” (Jablonka & Lamb, 2005, pp. 110-111).

In these highly structured systems control can be thought to condition likewise high degrees of trust. In such instances trust arises through intricately fine-tuned dynamical structures, elastic and strong, where flexibility is proportional to the system's ability to recover itself. Within any given dynamical structure the degrees of freedom in the system place a restriction on the *range* of permissible (recoverable) error, but not on the number of ways to deviate, for between any two delineated components of a structure there always remain infinite possibility. What the structure presses, in highly structured contexts, is refinement within a range of choice. Depending upon one's scale of experience however, an infinity of possibilities, within a very limited range of options, can be so practically insignificant as to feel like no choice at all, or it could be just the range to prompt extraordinary precision and expertise as witnessed in *Cirque du Soleil*.

The converse, where options are held widely open, can in a crudely defined system be "just right". Yet, too much choice across a high density of possibilities or where one must "get it right" can prove so overwhelming and intimidating as to preclude any possibility of choosing well—of having a sense of one's knowing. Lost in the trees, with no conception of the forest, yet asked to perform as though the forest were entirely visible (often according to someone else's forest-conception), is a prescription for "dammed if you do, dammed if you don't." It also describes the educational situation too often imposed upon learners as students, teachers, and administrators.

It fascinatingly also describes the huge and amazing task of emergence of an infant who, absent preset habit or structure, must come to construe an appropriately manageable psycho-physical self. Again, the difficulty of choice, and our ability to trust

in our choices, is a matter of fit and of scales of existence. In the case of the child, it can turn on the good-enough, first caregiver.

In my conception of teaching as giving audience in fathomable small-theatres of world, I am imagining the learning place as a place of play with scripts excerpted from disciplinary networks, for example, mathematics. As such, when I speak of the play of a system, I do speak of the play of its structure as located within the dynamic flexibility of the relationships holding that structure together and as also including the shadows of structures as the in-between places of creative possibility. Moreover, in emphasising this notion of giving audience, I am pointing to the importance of listening and witnessing well.

Trust and Control

In the present-day construction of education struggling to manage learners, issues of trust and control sit at the forefront of public consciousness. In the section below I draw from Guido Möllering's work in conceptualising a trust-control duality. I seed your reading of this discussion with several musings in light of the previous section on structures: (a) Trust with control, as Möllering develops the duality, operates within the context of an assumed-as-shared structure; (b) To varying degrees—and I believe these to be a measure of the power of the participant players—individuals sharing a structure are complicit in the construction of that structure; that is, in the detailing of the rules (tacit, explicit, and formalised in contract) that shape the structure and constitute it in terms of variably available rigidity, fluidity, and play afforded its participant players; (c) The degree that individual agents can and do take ownership, in the shaping of the collective dynamical structures of which they find themselves a/part, mitigates the degree to which

those persons operate in manner (oddly enough) to extricate themselves from those structures, assuming a tier above or outside; and (d) Where a person is seen to minister to a structure, while enacting visibly and tacitly a belonging in that structure, conditions a sense of “being with” in a participatory frame that heightens trust.

Addressing a common tendency to place trust and control in opposition—that which we cannot trust, we seek to control—Möllering develops an alternative thesis that posits trust and control as duality (as suggested in the example of Cirque du Soleil performers). Instead of thinking in terms of one *or* the other, “a trust/control duality means to say... that you cannot have one without the other” (Möllering, 2005, p. 290). In so doing, he refuses a tradition that puts voluntarism and determinism at poles of an either-or dualism. It is not the case that we either have agency or live out the consequences of pre-determined fates. Instead we have a situation where agency can only be possible in a structurally embedded context—where one can trust in the benevolence of acts freely taken within the degrees of freedom afforded by the structure (and beyond the reach of control) and one can trust in the ability of the structure to condition and constrain an appropriate range in degrees of freedom such that the trusted structure itself remains viable.

Questions of trust and control come to the fore where an agent or collective of agents appear: (a) to self-extricate from the structure within which others understand themselves to co-inhabit and instead (b) to minister to that structure from without, while assuming an immunity to the lived consequences of the ministrations given. This is precisely the posited position of God or other omnipotent Other. Of course, to varying degrees, I have just describe the conditioning possibilities that inhere in power

differentials, but also the problem of top down constraints and the importance of the collective, as a collective, in representative hierarchicalised structures, enfolding of and unfolding from parts. In as much as the voice of an omnipotent other, Lacan's Other, represents a collusion of bottom up sense-making, mindfully so, and is deeply implicated in that collective, then that Other might be a workable ally to viable individual selfhood. But an invisible tacit, unanswering Other surely does not come close to satisfying such a condition. The notion of democracy may be the closest we have of coming to a fluidity of bottom up and top down forces. That said, there are differences of perspective that may or may not be resolvable from either vantage and perhaps that is where systems start to fracture and or tier. I do think that there must be a functional organic limit to such tiering. In familial life, as has been developed, a child adapts to degrees of trustworthiness and learns to trust or not to trust attachment figures. It is here that first lessons of trust are made and set into unconscious, feeling, sensing experience of degrees of security.

Framing his inquiry in social theory, Möllering analogises his trust-control duality to an agency-structure duality and argues that, although not reducible one to the other, trust and control reflexively "assume", "refer to", and "create" each other. An actor trusts because of the contexts of embedded structures that control. But, all cannot be controlled; what's left is to be trusted. Each assumes the other. Control alone is not enough unless it is supported by trust and trust alone is not enough unless it is supported by control (p. 290). Accordingly, it would seem wrong-minded to think that a paucity of trust could be renovated by more control. There is a limit to control's capacity, especially in terms of infringing on areas in want of trust. Likewise neither can seeming shortages of control be necessarily improved upon by somehow instating more trust. The duality suggests a not

so simplistic relationship between the two. Yet, we *do* attempt to rally, or at least petition for, trust to fortify that which is beyond structural embeddedness. And conversely, we strive to embed greater control through structuring that which we are unwilling to trust. In education, both these “adaptive” gestures seem to proliferate. Might we instead situate here a question of degree and of limits to what might be tolerable within a particular context (perhaps in terms of embedded habit as the context of larger socio-cultural structures)?

The attempt to control (through force of anger or coercive tactics) or the striving to trust (or to convince oneself of one’s self-sufficiency, as in the avoidant child) are similar adaptive solutions that the hypervigilant child rallies to bolster insecure attachment systems. At some point however, in the absence of predictable good enough responses, despair can set in (literally set in physiologically structured ways so very difficult to adapt forward from) and with it a life legacy of heightened psychic struggle.

When trust and control form the basis of positive expectations, they do not merely coexist, they instead refer to each other, a process Möllering calls “reflexive structuration” (p. 291). Trust, as one’s expectation of the benevolent use of agency, presupposes the degrees of freedom within which agency has a chance to move. Taking Möllering’s thinking to the level of the learner: In trusting that a learner will use well an opportunity to learn, I am also trusting that his psychic-conceptual structures allow good enough freedom within which to negotiate that learning, assuming of course that there is motivation to learn, which in turn depends upon the question of which learning.

In Möllering’s social framing: “When asking whether an actor will use his or her agency benevolently, it also needs to be asked how much room for agency the relevant

social structures actually leave. Hence trust refers to control” (p. 291). Yet control also refers back to trust because the amount of room for agency that a particular structure leaves “is a question of the assumed level of trust in the actors concerned” (p. 291). Do I trust that the system (as a collective of component parts) is enough “in control” for me to risk leveraging my freedom—that system being as much the world in which I live as the internal self-world that “lives me”? There are issues of control and trust here that refer us to discussions on epistemological self-trust, and even perhaps ontological self-knowing as a kind of self-control, both accentuated in the narcissist’s plight.

It seems no coincidence that Möllering invokes the word attunement in relation to these considerations of trust and control: “When actors form positive expectations of others, they generally need to be attuned to the reflexivity of trust and control as a ‘complex interplay’ between agency and embeddedness (Sydow and Windeler, 2003: 71)” (p. 291). This thinking may be as much relevant in the context of larger social structures as in the more intimate world- and self-making relationships between, say, infant and attachment figure, student and teacher, analysand and analyst. I wonder about the implications here between the self, conditioned in intimacy, and the self that negotiates the world.

Deepening his duality, Möllering considers how trust and control create each other, and in the doing, seems to speak directly to the forces we each exert upon each other, especially in the intimate encounters that are other-making. He notes, “Whenever actors are aware that their benevolent exercise of agency is assumed or even taken for granted by other actors, this can have ‘an almost compulsory power’ (Simmel, 1950: 348)” (p. 292). Hence, trust produces control. In return, “control produces trust whenever

actors refer to and maintain social structures... [that is] social structures induce others to use their agency benevolently in order to confirm those same social structures” (p. 292).

Möllering concludes by introducing a necessary supplement to the trust-control duality: “suspension” as the temporary “bracketing” of doubt and uncertainty. The requirement of suspension arises out of irreducible social uncertainty and doubt. Trust and control, in duality, beg a suspension of doubt, a leap of faith, that “does not *eliminate* uncertainty but makes it liveable with *for the time being*” (p. 296). Positive expectations arise in the interplay of a trust/control duality and the suspension of remaining uncertainty. Möllering states that, “Positive expectations of others are not possible, if the actor fails to understand in a favourable way the embedded agency of those others and the uncertainty it entails” (p. 296). Considering the self, might we set the same requirements for positive expectations about oneself. Put differently, how is the becoming of one’s selfhood about finding ways to carry on “as if” one could justify epistemological self-trust in the context of some sort of ontological sense of a self “in control”? And how do we come to accomplish the feat in present moments of being (Möllering’s “for the time being”), and perhaps over the long haul, despite inevitable uncertainty given the opacity of a self to a self? Moreover, is the narcissist’s difficulty entailed in some kind of over-compensatory construal of a self struggling to live in such a duality—where suspension is both too much and not enough?

Finally, to Möllering’s ruminations, I close by adding two of my own, the first reiterates what has been thus far suggested: That is, the challenge of trust and control seems a matter of fit and not anything absolute. It is about suitable enough enabling constraints that are always contextual and only in the crudest of senses amenable to pre-

determination. Secondly, I wish to suggest that it may be as much a question of fitting degrees of freedom as it is about elasto-plasticity—as in the play allowed in the system and its fluid ability to self-change.

If a force of any sort acts upon a non-linear dynamic system in ways that would perturb the system and prompt a register to accommodate (even if such accommodation comes in the form of increased rigidity in resistance), this sets up a reverberation, a consequence, across the system that, in order to survive, results in some embodied shift in the system to incorporate the historicity of this event within an elasto-plastic continuum—from scarring to flexibility. At the theoretical bounds of such a continuum is hyper rigidity, where the perturbation fails to register and, at the other end we encounter the limits of plasticity after which the system, exceeding the bounds of its ability to accommodate, ultimately disintegrates.

The long and short of these observations is that a learning system needs to feel safe enough in itself, and in others, in order to negotiate its own self-change, where the degree of self-change that can be comfortably negotiated relates to levels of perceived trust and control, with and in the complexity of nested systems. Yet the robustness and resilience characteristic of attuned measures of trust and control develop in consequence of experiences of effortful challenges met through successful prior attunements with one's self and one's world. *In other words, one has to admit difference, suffer perturbations, in tolerable enough measure to allow for successful recovery and adaptive re-assembly to increasing vitality, in order to learn just how “intrinsically rewarding”, and sufficiently empowering (but not overpowering) that process and its consequences feel.* Hence, early environments that afford just enough freedom to stumble at the edge of

self and then recover—permit, through experience, the development of a subjective wisdom on learning about learning that might best be described as finely *self-attuned risk-taking*.

In that regard, I suppose I fancy the role of teacher, as both instigator of difficulty (Milner’s teacher as “disillusioner”, 1956/1987, p. 188) and afforder of structure (see Winnicott, 1971/2005, on conditions of trust, p. 75; and the “holding environment” in Milner, 1972/1987, pp. 248-249) in good enough measure, that the student might engage valiantly, pressing the limits of self in play, and in the process develop a world-opening sense of his or her own possibility. As teacher, I seek my own emergent redundancy in regards the student, ultimately hoping to defer my role to a world that teaches with student as selectively attuned-enough learner.

Control as over-structuring.

“Whatever matters to human beings, trust is the atmosphere in which it thrives” (Bok, in Baier, 1996, p. 95). Yet, as Baier points out, “Not all the things that thrive when there is trust among people, and which matter, are things that should be encouraged to thrive. Exploitation and conspiracy, as much as justice and fellowship, thrive better in an atmosphere of trust” (1996, p. 95).

In her seminal piece “Trust and anti-trust,” Baier reminds us that, “if part of what the truster entrusts to the trusted are discretionary powers, then the truster risks abuse of those and the successful disguise of such abuse” (1994, pp. 103–104). Here trust might be construed as a giving over of control. Baier addresses imbalances of power that characterise most relationships of trust and that likewise comprise the conditions of its abuse. There she notes how, in its deliberations of an ethics of trust, modern philosophy

has taken a myopic focus seeing little beyond promise and contract. Yet, “the right to make promises and the power to have one’s promises accepted are not possessed by everyone in relation to everyone else” (Baier, 1994, p. 112). In terms of imbalances of power, we would do well to remember that it takes but a microgram of difference to tip a teeter totter: On this count, most of what has characterised the philosophising about trust, seems to bear little situational relevance in the world. Yet, and in unsurprising consistency, trust construed through promise and contract continues to support the sort of aberrations characterising present admonitions to teachers and school leaders—these ministered with the controlling weight of contract and moral obligation—that, these social actors must not let children and the public down. Under the banner of teaching as among the noblest of professions, teachers are admonished to renounce themselves and their visceral inclinations to a better wisdom of enacting particular behaviours—these explicitly detailed by the behavioral and management sciences, for the purpose of renovating diminished trust in teachers and subsequently in schooling. Make no mistake, these sorts of enactments are in play in greater and greater force in schools in Canada¹³¹ as elsewhere.

Beneath such a rhetoric of promise and contract, meant to bring education into line, ferrets a stubborn uninterrupted premise: that we could possibly structure into control and surveillance all those expectations, become obligations, otherwise held in community through and with trust. What is neglected in such a premise is a principle

¹³¹ Only yesterday did I yet again entertain a conversation describing the situated consequences of well-meaning leaders—often young, well-trained through this kind of management literature—trying to enact this kind of over-simplified solution to a larger problem of trust that permeates present times and our culture (see the “nightmare that is the present” in Pinar’s *What is Curriculum Theory?* (2004) and Lasch’s (1984) descriptions on *The Minimal Self*. In my esteem these characterizations do still hold, and increasingly so, in my experience, in Canada as well as the United States).

articulated most basically in the second law of thermodynamics, but also reverberating across levels of organisation, even (and perhaps most especially) to the level of the social systems: That is, as we create structure, so too do we construe its chaotic counterparts in like measure. As we increase that which is controlled so too do we augment (not diminish) the uncontrolled spaces wanting trust's fortification. For in as much as control requires the exertion of force, it demands greater, not lesser, trust in the power wielding that force. When control *is* forced and enforced, the whole system shifts to a state of effortful deterministic unease in need of continual supplies of energy to maintain even the status quo of order. That energy has to come from somewhere—indeed, it comes from the spaces in between, the undersides. And so, efforts of control like a dam, constantly buttress against control's excess. That such a relationship might hold all the way up to social systems is evidenced in anthropologist Michael Taussig (1987) writings of the consequences of the forceful attempt to order a society:

Timerman's [imprisoned and tortured in Argentina's Dirty Wars] burden was double. He was not just victim: he was victim of what he had himself prescribed—military dictatorship as the solution to the disorder afflicting the nation.

And the result? A society shrouded in an order so orderly that its chaos was far more intense than anything that had preceded it—a death-space in the land of the living where torture's certain uncertainty fed the great machinery of the arbitrariness of power, power on the rampage—*that great steaming morass of chaos that lies on the underside of order and without which order could not exist* [emphasis added]. (Tsaussig, 1987, pp. 3–4).

The contortion, and abandonment, of schools-to-factories (implicitly thought and then explicitly detailed, in sadly no uncertain terms, by the Tyler rationale) marks the continued edification of that error: that it might be possible to structure away chaos or to control trust. Instead, we would do well to realise that order begets chaos, each being counterpart to the same simultaneity—and this is true however we might be wont to use the one to bracket and cloister the other—however we might fool ourselves into thinking we could possibly dichotomise inside and outside. The educative condition of our schooling enterprises, described by Pinar as the “nightmare of the present” (2004, Part I), seems in retrospect a plausible consequence¹³² of the over-success of an Enlightenment (Promethean) project of will and determination that overflowed into the Modern. Schools governed by ever-stronger and widespread Tylerian exertions are those monstrations wrongly wrought of a collective misunderstanding of any transferability to life systems of “scientific” management’s acclaimed efficiency in mechanical, mass production. Still, yet, and with ill-fated false assurances of promise and contract, energies and resources funnel into aspirations of managing districts, schools, teachers, and children, into learning. The latest iteration of such management takes Baier’s theorising, and though not recognising it, does surely wield it, heralding trust, as has been seen, as management’s newest, highest commodity.

¹³² I hasten to highlight a pivotal difference between hermeneutics and a narrative of causation. Whereas hermeneutics distinguishes an organic trail of possibilities taken and others foreclosed, causation implies the mechanistic inevitability of a particular path as trail of predetermined sequenced acts.

From control and pretense to trust and presence.

To fail as a poet [a self-fashioner of one's life-as-text] is to accept somebody else's description of oneself, to execute a previously prepared program, to write, elegant variations on previously written poems.

[Everyone has the unconscious] need to come to terms with the blind impress which chance had given, to make a self for [ourselves] by redescribing that impress in terms which are, if only marginally, [our] own." (Rorty, 1989, pp. 27–28, 43)

We must ask... whether the "I" who must appropriate moral norms in a living way is not itself conditioned by norms, norms that establish the viability of the subject. It is one thing to say that a subject must be able to appropriate norms, but another to say that there must be norms that prepare a place within the ontological field for a subject. (Butler, 2008, p. 9)

The present work has framed and developed, as beginning premise, rising existential anxiety pervasive at least among Western cultures, but also perhaps birthed out of originary and timeless human challenges of co-negotiations and co-articulations of self with and through others. The post-modern condition has called into question metanarratives, legitimate authorities, structures (once assumed as foundational and certain), and the nature of being. We no longer have the luxury of blissful ignorance or any deferral of responsibility for our actions to higher authorities, leastwise not in the old ways. But rather than live in uncertainty¹³³ there is afoot a desire to return to former authorities, those ousted during that clear-headed, enlightened age of reason. And so as

¹³³ A matter of degree, living in uncertainty, is a difficult place to live. At the cusp of a dramatic change one way or the other, we rightly are distressed at the proposition of impending catastrophe.

some cling to the power of the technological, others return to the natural as final authority (Lasch, 1984, p. 19), increasingly people shift away (ideologically though not practically¹³⁴) from all things modern, scientific, and technological toward their antitheses, the likes of mysticism, magic, alternative medicines, back-to-the-basics, fundamentalisms, and New Age-isms bent on rejecting hegemony—as if hegemony itself could be extinguished once and for all.¹³⁵

The post-modern condition seems to be taken up in conflicting gestures: an anti-modern that presses us to question and assume less (or perhaps differently); but the still modern in responding: if not this, then what shall we substitute, do, perform, prescribe? Thus, as former natural attitudes reveal their falsity, they give way to replacement ones, and a shifting system continues to work and perform us. The current ethos characteristically railing against and living in suspicion of those authorities (the likes of organised religion, state, science, medicine) once unquestioningly deemed entitled, legitimate, privileged, and right¹³⁶, substitutes newer authorities—pleading the relative nature of truth and the configuration of all in language (see discussion in Campbell, 2002)—and positions these new authorities as somehow more legitimate. The radical

¹³⁴ It would be inconvenient to not embrace the internet or the latest telecommunications tools.

¹³⁵ E.g. see Jardine & Campbell, also the notion of natality (as cited in Arendt and in Jardine's "The profession needs new blood," 1995). "The most heartening message of *The Human Condition* is its reminder of human natality and the miracle of beginning" (p. xvii). Arendt's remedies: "taking further action" "forgiveness" and "the human capacity to make and keep promises" (Canovan, 1998, pp. xviii-xix). Note Arendt's desire to bring the world into control: "But *The Human Condition* is just as much concerned with action's dangers, and with the myriad processes set off by human initiative and now raging out of control. She reminds us, of course, that we are not helpless animals: we can engage in further action, take initiatives to interrupt such processes, and try to bring them under control through agreements. But apart from the physical difficulties of gaining control over processes thoughtlessly set off by action into nature, she also reminds us of the political problems caused by plurality itself. In principle, if we can all agree to work together we can exercise great power; but agreement between plural persons is hard to achieve, and never safe from the disruptive initiatives of further actors" (Canovan, 1998, p. xix).

¹³⁶ See, e.g., Harding and notions of "Whose Knowledge is of Most Worth" as evidenced in 1991, *Whose science? Whose knowledge? Thinking from Women's Lives* & Harding's 2004 edited work *The Feminist Standpoint Theory Reader*.

constructivist declaration that the real is fiction (Jardine, 1992) is followed by the multiple positing of alternative reals, each claiming legitimate epistemological authority (e.g., new age spirituality, alternative medicine, fundamentalisms, back-to-the-basics). Yet the “successes” of these gesturing agencies in the world continue to ride upon the decisive arrows of individual and collective willpower, discipline, determinism (of acting out preconceived intentions)—in short our ability to control. There is an irony in any attempt to will, discipline, or determine something otherwise. One goes to a holistic practitioner to feel better, or to be one’s best (and those motives are never called into question), and returns with a set of concoctions and assurances that these alternative medicines, but medicines nonetheless, will effect the cure. They are better because they are natural, but the mindset desiring either the quick fix or the clean answer, in this example, is rarely critically scrutinised. In unwittingly trying to use the master’s tools to bring down the master’s house, are we not simply erecting a different version of the same?

One might frame a present dilemma in terms of a problem of trust as against control, with voices charging for more control or more trust. Ironically, discourses around trust are largely discourses about quantifying it and renovating it through certain practices.

That the topics of this dissertation are so far removed from the bulk of discussions in educational forums constitutes, for me, a disconcerting statement about how we conceive of and inhabit education. That these absences remain the case despite ongoing concern for student motivation, engagement, and agency is all the more troubling. Rather than grappling in the fecund sense of the psyche that conditions the way

learners come to learning, we, in my opinion, seem too enamoured by the promise of such quick fixes as parade under the banners of brain-based instruction, authentic learning, and inquiry-based methods. We do so, all the while gauging the success of interventions according to some combination of: (a) empirical measures of achievement, these questionably applied to complex system and (b) student and parent satisfaction surveys that put all faith into the lovely knowledge that we dare to admit to consciousness. The whole effect, among other effects—but the one of interest here—is to inadvertently spawn a sense of overblown entitlement given unto and accepted by learners.

To what degree are we, the educators, conflating the practice of “caring for” the learner and acting out our desire to be saviour as “caring ones,” by preemptively rescuing the learner from possible distress? Is it the case that we trip over ourselves in order to cater to the expressed whims of entitled learners and publics who, in an era of dire solipsism, have become self-professed experts of education and all things “google-able”? What blind enmeshment entails in education that continues to be, to oppressively be, about management, sales, products, and commodities? Ultimately I believe that, in skirting core issues of self—the selves of teachers and students and public collectives—the majority of present efforts in renovating education are symptomatic of widespread and “commonsense” dissociative enactments at levels societal and cultural. We miss the point and continue to do so in any variety of ways.

We live, know, learn, teach, and negotiate selfhood in a time that might be described as a crisis of ontological security that presses a retreat, to Lasch’s “minimal self” (1984) characterised among other things in a longing to return to the

“undifferentiated contentment of the womb” (Lasch, 1984)—a place where the world might be both “in control” and “in trust”.

A centering contention then, is just this, that a want for greater control or greater trust, one over the other—thought both at the level of the psyche and at the level of the social—misses on several points: that trust and control exist in paradoxical duality;¹³⁷ that fecundity and potency depend upon each other;¹³⁸ that a life-cycle is always in dialectic play, an ebb and flow of life and death and structures that construe and are construed out of their chaotic outsides.

Issues of control and trust take their naissance in beginning psyches. It is how we come to know our place, who we are in the world, and in knowing, learning, and teaching they figure centrally. How can understanding of the interplay of trust with control inform schooling, pedagogy, education? How can curriculum become transitional subject-object with enough play to allow a space of becoming? What might we learn from psychoanalytic work in mindfulness and mentalising to live in middle spaces of being with/in a peopled world?

Trust as necessary to perturbation.

One cannot pursue such current catchwords as ‘strength’ ‘imagination’ and ‘innovation’ if the decisions regarding the form and content of teaching are

¹³⁷ Notable dichotomizations of trust against control: (a) That, though the era of reason and technologically-assisted willpower brought us to the heights of what potency might do for us, it essentially followed a one-sided myth (to perhaps impending demise) that we might ever succeed in subduing, controlling, dominating an unruly, wild, unpredictable world, red in tooth and claw; or conversely (b) that the natural world variously and romantically described as wise, traditional, pure, complex, and balanced (see Bhaktin’s chronotopes in Coyle & Fairweather, 2005) embodies everything good and ought to be trusted as against science and technology’s aberrances of Frankenstein proportions.

¹³⁸ We need every bit as much the fomenting possibilities of the unnamed untamed (definitely non-linear) spaces as we do the linear intentionalities and enactments of the structures we create. We emerge out of an era of willpower in education into one in need of creativity’s renovating influence.

imbedded in a culture that is primarily underpinned by prescriptive measures of accountability, monitoring and audit. (Curzon-Hobson, 2002, p. 272)

Curzon-Hobson's oft-cited (2002) pedagogy of trust in higher education, points up trust in and between students and teachers as essential for negotiating learning amid the unpredictable rhythms of dialogical engagement. Schwabenland's work with disruption as pedagogic intervention extends Curzon-Hobson's notion of trust as passion (as cited instead of policy), linking it to bell hooks' conceptions of passion as 'engaged' pedagogy (2009, p. 305). Schwabenland describes a two-way trust, where the teacher too "has to feel a degree of trust in her relationship with her students... [in order] to be prepared to have her own preconceptions disrupted" (p. 305). She argues for trust as necessary condition to the kind of disruption that makes room for reimagining the potentiality of the other, emphasising that, for this trust to be realised, "requires passion, empathy, the ability to share perspectives, and the ability to hold awareness of self and other in tension; the very capacities that can be enhanced through disruption" (p. 305). In this, Schwabenland works within and links to the troubling of a pedagogy for empowerment that characterised Elizabeth Ellsworth questioning. Trust might be said implicit to the contingencies captured in Ellsworth's refrain,

If you can talk to me in ways that show you understand that your knowledge of me, the world, and 'the Right thing to do' will always be partial, interested, and potentially oppressive to others, and if I can do the same, then we can work together on shaping and reshaping alliances for constructing circumstances in which students of difference can thrive. (1989, p. 324)

It is worth repeating Butler's call for an ethics of risk, where responsibility requires a faith, a trust, in the imperative of such risk.

We must recognise that ethics requires us to risk ourselves precisely at moments of unknowingness, when what forms us diverges from what lies before us, when our willingness to become undone in relation to others constitutes our chance of becoming human. To be undone by another is a primary necessity, an anguish, to be sure, but also a chance—to be addressed, claimed, bound to what is not me, but also to be moved, to be prompted to act, to address myself elsewhere, and so to vacate the self-sufficient “I” as a kind of possession. If we speak and try to give an account from this place, we will not be irresponsible, or, if we are, we will surely be forgiven. (2005, p. 136)

Acknowledging the centrality of trust in a pedagogy of higher learning—a pedagogy that asks us to question those very structures that compose us—and recognising these actions as pivotal to social and political change for a world more ethically configured, governed, minded, and lived, we are still left with the challenge of resolving these claims for trust into the world of the child and young adolescent student.

By way of an introduction to collected works, Marion Milner begins a narration of her academic life by recollecting first encounters with Maria Montessori:

Here was somebody who actually believed that children could be trusted to know what they needed to learn and to do it by a concentrated kind of play, not just any play but using material especially provided so that the play really become [*sic*] work.... In fact the question of what is the creative relation between work and play was to become an interest that finally landed me in the psychoanalytic

consulting room or playroom, asking the analysand to say, or if a child, to do, whatever came to mind. In fact to play, whether with words or with toys. My task would be then to listen or watch and try to describe what I thought they might be really trying to say in the context of how they saw the meaning of their lives.

(Milner, 1987, pp. 1–2)

Is not the pivotal space of learning—and I do mean any learning—situated in the heart of ambiguity: in that nebulous opening (burrowed between, and made possible by, lines of certainty and control) for emergent meaning- and experience-making of self with other, where the thing-sought-in-understanding becomes transitional subject-object bridge, allowing a trafficking of self into world and world into self? Negotiating such a third in-between space, that site of creative play, requires trust. In *Play and Reality*, Winnicott emphasises this point.

The potential space between baby and mother, between child and family, between individual and society or the world, depends on experience which leads to trust. It can be looked upon as sacred to the individual in that it is here that the individual experiences creative living. (1971–2005, pp. 138–139)

Dewey describes unselfconscious absorption in an intellectual task as a “whole-souled relationship between a person and what he is dealing with” (1916/2004, p. 166). For Dewey, an attitude conducive to learning combines, among other qualities, directedness—denoting “not conscious trust in the efficacy of one’s powers but unconscious faith in the possibilities of the situation (p. 167)—with open-mindedness—that “active disposition... [that welcomes] points of view hitherto alien... [and that] desire[s] to entertain considerations which modify existing purposes” (p. 169). Moreover,

Dewey explicitly addresses the problem of “rigidity of method” saying that “the zeal for ‘answers’ is the explanation of much of the zeal for rigid and mechanical methods” (p. 169). He advocates

a kind of passivity, willingness to let experiences accumulate and sink in and ripen, which is an essential of development... [P]rocesses may not be forced. They take their own time to mature. Were all instructors to realise that the quality of mental process, not the production of correct answers, is the measure of educative growth something hardly less than a revolution in teaching would be worked. (p. 169)

Finally, acknowledging the ever-present danger that methods “become mechanized and rigid, mastering an agent instead of being powers at command for his own ends” he challenges “the assumption that there are no alternatives between following ready-made rules and trusting to native gifts, the inspiration of the moment and undirected ‘hard work,’ is contradicted by the procedures of every art” (p. 164) .

In short, with Dewey (1916/2004), Milner (1987), Montessori (1949), and Winnicott (1971/2005), I acknowledge the conditioning of appropriate trust—in situations, in others, in self—as fundamental educative concern, and I believe this to be true regardless of subject discipline or age.

Provoking and Supporting Learners

Mimesis and poiesis

At the heart of becoming, any seemingly terrorising threat resides in an anxiety over self and the issue of self-changes pressed, resisted, and made in response to ever-shifting ecologies within and without: Learning, as ongoing innovative adaptive re-

formulations of self, entails change that, from the purview of a self, *is* (to varying degrees of discernment) creative world-changing. That is, to the extent that a changed self can not but phenomenologically experience the world differently, learning alters the world. Moreover, as constitutive part of the world, a self that changes also shifts the very world that it, to some degree, constitutes.¹³⁹

Sadly, an archaic notion of learning persists—the one complicit in schools fashioned, not as educative places for effortful self-formation with/in a social world, but as factory spaces for repetitive training as indoctrination. In a recent collection of essays spanning the work of Eric Kendal, entitled *Psychiatry, Psychoanalysis, and the New Biology of Mind*, a one-size-fits-all, 1956, relic persists in defining learning at the level of neuronal synaptic transmission “as a prolonged or even relatively permanent *change in behavior that results from repeated exposure* [emphasis added] to a pattern of stimulation (Thorpe 1956)” (1979/2005, p. 13). The “commonsense” subtext of this passage (residue from the behavioral sciences of a bygone era) when taken to the level of even a collective of neurons, not to mention a whole mind and collections of minds enacts a near complete disregard for qualitative emergences at increasing levels of complexity. Sadly this kind of unnecessary reduction underpins anachronistic educative structures in the service of training, aligning, and normalising.

Donna Trueit (2005) calls attention to mimesis and poiesis: two culturally-circulating conceptions on learning. Trueit’s sentiment, taken to the question of

¹³⁹ However, as with passengers in a train with the shades of awareness on awareness drawn, changes in self that are congruous with changes in others and with the system we both inhabit (as cited inside the train, carried along by its engine) are in some sense constitutive of a kind of absence of change. Difference only comes to us when we open the blinds. Perhaps with the blinds down we are like Heidegger’s notion of the animal as poor in the world and the train carrying this collective along is that which is world-forming (See especially Agamben’s *The Open*, 2004). But who’s driving the train?

curriculum, reverberates concurrently, it seems to me, with that spoken in a psychoanalytic frame by Jessica Benjamin: “Without surrendering to a process of open discovery, to acceptance of the unknown, how can we not be doomed to mere repetition” (Benjamin, 2005, p. 196)? Taking an explication from the language of dynamic systems theory: mimesis signals entrainment; that is, the dynamic coupling of like patterns (the development of which can increase the power/potency of a system); whereas poiesis signals shifts in patterns (the developments of which can increase the choices/fecundity availed by the system). Notably, shifts in pattern imply patterned coupling and decoupling of associated dynamics.

Switching to the neurobiology of psychoanalysis we find that Freud’s observation of the “compulsion to repeat,”¹⁴⁰ seemingly motivated “beyond the pleasure principle” (Gedo, 2005, p. 8), is understood in neurophysiological terms as the effects of repeated use in strengthening synaptic connections (actually in decreasing resistance to flow). In other words, synaptic mechanisms, such as long-term potentiation, which are thought to underlie learning and memory favor repetitive behavior because whatever one has done

¹⁴⁰ Crucially, I do not mean to assume here, in the psychoanalytic sense, that any such forms of repetition need be repetitions of *actual events* in the past: “it is, rather, the recreation of past conditions in the intrapsychic world” (Gedo, 2005, p. 130). To this we can also add, that such intrapsychic repetitions are never identically triggered, leastwise at the bio-physical level (and I might add, at the contextual lived level, as in the maxim that “we can never be in the same place twice”): The principle of degeneracy entails “the ability of structurally different elements of a system to perform the same function or yield the same output” (Edelman, 2004, p. 43). Although we are predisposed to repeat, repetition can never be exact (across levels of its consideration: zooming in or out to consider it). This many to one possibility for enactment (or overdetermination in psychoanalytic parlance) allows for difference and plasticity in a system tipped in the direction of repetition but with allowances to adapt and change. At the cultural level, Butler talks about performativity and the interpellation of individuals into gender, begun with the announcement “It’s a girl”, yet the system allows for disruption, however involuntary that disruption might be. While these notions are pervasive across her work, it is particularly salient in her discussions of gender as “a kind of doing, an incessant activity performed, in part, without one’s knowing and without one’s willing. . . . [yet] a practice of improvisation within a scene of constraint” (2004, p. 1) where “sexuality is never fully reducible to the ‘effect’ of this or that operation of power. . . . [but] emerges precisely as an improvisational possibility” (p. 15). Thus, to my mind, Butler too speaks of the openings created by and in the shadows of structures, of poiesis made possible because of the never exactly repetitive performances of being.

once is easier to do again (Edelman, 2004, pp.32-47; Gedo, 2005, pp. 7-8). Freud's twin discoveries of transference and the repetition compulsion turn out to be crucial components of adaptive behavior (Gedo, 2005, p. 9).

Judith Butler drawing from Spinoza's *Ethics* zooms us outward and considers repetition at the intersections of individual and social, singular and plural: "A thing endeavors to persist in its being... a form of vitalism that persists even in despair" (2004, p. 235). Yet, repetition and performativity at the cultural and enculturating levels entail also openings for poiesis: "The will to live, the affirmation of life takes place through the play of multiplicity.... [such that m]ultiplicity is not the death of agency, but its very condition" (Butler, 2004, pp. 193-194).

Returning to non-linear dynamic systems, and mind in life, Thompson distinguishes emergent processes as *qualitative differences* arising out of nonlinear interactions in a poiesis of creative becoming, and this contrasts with the processes of linear systems that, though they may engender amplifications, do not spawn the difference of emergence. Instead linear systems (i.e., mechanical), being additive or proportional, result in aggregate accumulations of the repeated (Thompson, 2007, p. 419). In this reckoning, mimesis aligns more closely to linear accumulation. It characterises a reinforcing gesture toward more of the same and is thus generative of rigidity and control. Poiesis, on the other hand, entails the emergence of difference out of the cracks and (because of) the constraining influences of structures (see Supplement section: Structures). Paradoxically, the creativity of poiesis could not come into view without some mimetic amplification. That is, new patterns only come into awareness if they have a chance to grow (to entrain and replicate) enough to be visible in the perceiving system's

scale of time and space. In this way mimesis and poiesis dance with each other in the creation of structure, difference, and play such that life, as embodied and enacted in dynamic learning systems, can be both robust and resilient enough.¹⁴¹

Trueit, taking these notions to political and cultural levels, “suggests that rationalism is a mimetic form of thought” and offers “poietic thought—a complex process of creating, imagining—[as]... discursive tool to help us move beyond the confines of modernity” (2005, p. viii). I too perceive modernity’s rationalism in terms of a moment of over-valuing mimesis at the cost of poiesis. We have been marching toward rigidity for some time. On the scale of human life, it has been a lengthy moment of forgetfulness in terms of, especially, realising the primacy of poiesis in wisdom traditions much older than science. But, rigid structures do ultimately crack. I believe that ours is a *kairos*¹⁴² of disruption, rupture, and emergence at all levels planetary from the microscopic, as exemplified in viral and bacterial emergences, to the macroscopic as, for example, in the literal movement of tectonic plates in response to melting glaciers that shift weight distributions on those plates. Emergences arise out of openings in the breaches of structures—breaches both constitutive of the very structures themselves (the structure entails its shadow—the positive and the negative co-create each other in

¹⁴¹ The principal of good enough in complexity science is one akin to a middle way. Viable dynamic systems behave on a principle of adaptive sufficiency. There is no innate drive within systems to expend more or less energy than conditions require. Accordingly, a muscle will equally respond to exercise by becoming strong enough or atrophy in the absence of an environmental perturbation requesting more of it. For example, the strength of bones in animals will only be marginally greater than the greatest force that bone typically experiences. Life does not structure itself like mechanical systems do, with a large margin of error, just in case. Indeed, life forms do not strive to get an “A” on design or function for some unforeseeable task. They don’t prepare for life, they simply live it as necessary in the moments, self-embodiment a history of responses based upon an adaptive principle of good enough.

¹⁴² I prefer to hold, or rather return, to the Greek distinction between two kinds of time: *chronos* and *kairos*. *Kairos*, with its emphasis on the thickness of time, the richness of moments, and a non-linear rhythm of being is, for me, more in tune with what I understand about life and its possibilities in fecundity and poietics. With words such as these I wish to lean into renovating curriculum and, with it, present systems of tutelage (as in the guardian who attends to the boundaries and edges of being).

aposition) and also provoked by the system's dynamic status in far-from-equilibrium engagement with its environment. Clearly, as highly structured beings we would not adapt well if our planet became itself too creative in response to our perturbations—we component parts acting en masse on its surface. Not all emergences are those we might like. Again it depends upon scale, one relative to our existence.

Stress—the kind that presses response—exacerbates the tension between bottom-up and top-down forces in a system. Like a pressure cooker, as the system rallies itself in top down fashion to contain the threat via “tried and true” habits, this added pressure can work to excite bottom-up activity in the system. Indeed, findings in epigenetics highlight this second point. “Microorganisms have systems that increase the rate of mutation [at the nucleic sub-cellular level] in stressful conditions [at the level of the cell]” (Jablonka & Lamb, 2005, p. 364). The resources out of which change can form its creative response already reside within the “learning”, that is the historied and therefore “learned” system: “When there is a cellular response to changed conditions.... usually.... [w]hat changes is which genes are switched on and which are switched off” (Jablonka & Lamb, 2005, p. 104). Looking at the same phenomena on a macro-scale consider Thomas Kuhn's (1996) *Structure of Scientific Revolutions*: During times of normal science the existing paradigm allows room for subtle adjustments only—minor¹⁴³ phase shifts, in dynamic systems parlance. However, as minor adjustments prove less and less efficacious at explanation and/or prediction, the system experiences added pressure. Some participants will adamantly oppose maverick innovations as unintelligible, while others may, in a kind of

¹⁴³ In describing a change as minor, I do so in the context of the scale invoked. A minor phase change in a scientific paradigm might be felt at say a research institute as a much larger change if it involved a redistribution of faculty. The researcher who was phased out or into a position in the institute might experience the event as life changing, so not minor at all.

rising desperation, be more willing to try something different. As hot spots of activity rally added support and either converge or compete, one with the other, a tipping point is reached with a critical mass of entrainment that engenders a large-scale paradigmatic shift towards a new attractor regime, in this case the revised scientific-world view.

It is no surprise that, in a *kairos* of stress, people and collections of people enlist their executive conscious functions more energetically to respond and diffuse difficulty. In so doing they hold to greater rigidity and control, thus diminishing resilience born of trust and attunement in being *with* the world.¹⁴⁴ In effect, systems do what Lasch describes in *The Minimal Self: Psychic Survival in Troubled Times*, they execute “a kind of emotional retreat from the long-term commitments that presuppose a stable, secure, and orderly world” (1984, p. 16). Seligman describes a similar phenomenon in terms of dynamic systems theory when he notes that “psychic fragility leads to rigid systems, even though such rigidity increases the possibility of breakdown” (2005, p. 299). Through “virtue” of Promethean-like human will (powered by Newtonian rationalism and engineered via escalating social organisation) our seeming success, over the last several hundred years, at top down enforcement and entrainment—at control—has paradoxically issued its loss: for absolute control is Narcissus’s illusion.

To engage in self-change—to learn—is to effectuate self re-formulation that, in the doing, names (as cited insofar as one might be aware) the present, familiar self (and, with it, the world that the self knows) as, at best, contingent foundation. “Any learning is potentially psychically dangerous” (Bibby, 2010, p. 32). Conceived in this way, learning,

¹⁴⁴ This is perhaps the role that religion and spirituality has played. Trust in the process, conceived as part of an omnipotent creator’s design—a creator to whom we can make invocation on our own behalf, enables us to live and act with greater psychic comfort in uncertainty.

by definition, is that creative act to potentially riddle a preservation of the very self¹⁴⁵ one knows—and it does so for an as-yet-unattained future. To be sure, as beings embedded in ecologies in flux—and so confronted with, in the least, the implicit request for response as adaptation—the act of not changing poses a differently conceived menace to self-preservation, this time in insufficiently viable co-emergent trajectories. In either case, challenges to self-preservation (thought here, literally, as self-constancy), at some level and to varying degrees of awareness, invoke questions of trust and control in coherent and adaptive enough continuations of self. Life exists in a tentative space between order and disorder, cosmos and chaos—a place where trust and control figure central to enacted intentions¹⁴⁶ between two threatening “ends”: utter rigidity as a kind of rigor mortis, and utter disintegration as that decayed return to future possibility.¹⁴⁷

Speaking psychoanalytically through the language of non-linear dynamic systems, Keating and Miller remind that “plasticity and change occur only at the expense of stability” (2000, p. 384). And yet, life, to be life, is autopoietic; that is, self-changing, self-creating, self-renewing. How then do we live well in trust, and in control, to hold together with resilience? Where might we locate a sense of stability, if the structures we inhabit and that inhabit us are mutably dynamic? Might we return to trusting an uncanny

¹⁴⁵ Admittedly the self one knows might be static, shifting at a consistent pace, or shifting its pace consistently. Living systems are not so regular however. And so, to varying degrees, the “self one knows” and desires to preserve could exhibit varying degrees and types of patterns of sameness and change.

¹⁴⁶ Thompson (2007, p. 25) discusses intentionality and the given and made, where noema refer to the intentional object (the object in its givenness) and noesis refers to the intentional act; that is, the “mental act that intends the object and discloses it in a certain manner” (p. 25). Intentional experiences are acts having directedness (not states having content). See pp. 26-27 for the transcendent, transcendental, and immanent of phenomenology.

¹⁴⁷ “*The life history of a living system is a history of structural changes contingent to internal structural dynamics of the living system as well as to the structural changes triggered in it by its interactions in the medium, and it is a history that lasts as long as the living of the living system is conserved through those structural changes*” (Maturana & Gerden-Zöllner, 2008, p. 23).

bodily knowing inherent in autopoiesis itself—in Heidegger’s Dasein and Mitsein;¹⁴⁸ that is, in the very Being of *being* and of *being-with*¹⁴⁹ and in the world? Astounding stability—and I would contend, wisdom—is evidenced in the historical continuity embodied within our very selves, as biological-cultural beings: “We harbor the past everywhere within our bodies” (Thompson, 2007, p. 91). Here is a relational past uniquely manifest in each life yet commonly shared with larger systems (both comprising and composing us) and in concert with companion life forms of the same historically shaped commons. That we *are*, at some level, testifies to our co-adaptive success at being.

Learning exists in the ontological possibilities of emergence as being (Dasein) and becoming in an always-already relationality in and with others (Mitsein) of a historically conditioned world. Gestures of too much or too little control, fail to allow play, in good enough measure, for emergence’s possibility in structure-determined dynamics of being—a possibility realised in concert with/in ecologies that both teach and are taught, that constrain and are so constrained. To trust a process is not to relinquish everything to it, rather it is a trust borne of understanding the values of fecundity and potency: the fecundity in un surveilled moments of creative brewing, fermenting, bubbling up, and losing of self; and the potency of purposeful determinations that are

¹⁴⁸ “For Heidegger, the term Dasein should be understood as ‘openness-to-being’ or a ‘being-which-opens.’ For instance, when you and I meet, I don’t simply convey an experience inside me to inside you. I am an openness-to-being and you are an openness-to-being. Always already we are being-here-together and this being-here-together is essentially already manifest in our bodily attunement-with each other and ourselves. And out of this being-together and our mutual body attunement our understanding-with is also manifest. Our ‘being-with is ‘explicitly’ *shared* in discourse’ but our being-with ‘already *is*—only unshared as something not grasped and appropriated’ (Heidegger 2001: 152, original italics)” (Frederickson [in Frie & Orange], 2009, pp. 56-57).

¹⁴⁹ Frederickson extends the Heideggerian notion of being with in complexity terms: “Being-with is a dynamic, non-linear relational field of two subjects in a continual state of mutual attunement on a bodily level” (2009, pp. 56-57).

habit and inclination's drive for resolution. In acknowledging the wisdom of being, of being-with, and of the autopoietic spirit infusing life, is a call to understand the ways that we are well to trust this process of learning as the becoming life-force of emergence.

Such trust however, is not easily given. It is something that grows out of anxiety loved and courage thus taken and rewarded—in heightened vitality, vigor, and a self-quieting sense of security in one's own possibility. For, emergence happens out of places of disruption where some level of dismantling has made possible a difference to take root—in some sense from the beginning. The loosening moments of letting go that precede and make possible new dynamic assemblages can be frightening, especially given the unpredictability, by definition, of creative emergences. An unanswered question hangs in any such shift: Can the system, can I, survive the dismantling and come out whole on the other side? Dare “I/we” risk this partial giving over of self/collective-self to cosmos and chaos. Seligman describes the work of the psychoanalyst in dynamic systems terms:

If the disequilibrium is too extreme or too sudden... a system may disintegrate, or it may [in a sense, regressively] reorganise in an even more rigid and costly way.

Working at such unstable points can be full of strain. Systems require a great deal of energy to overcome entrenched attractor patterns; even as things are shaking up, systems resist changes to their equilibrium. (Seligman, 2005, p. 301)

For Seligman, skilled psychoanalysts have an awareness of such dynamics, one to which they intuitively respond: They “titrate their interventions accordingly when anxieties and other affects are intense, but they do it mostly implicitly” (2005, p. 301). So too, I believe, with “skilled” teachers. Seligman's descriptions of the work of therapists

resonate, for me, with Pinar’s descriptions of the work of exemplary teachers (not necessarily in schools) as those private-public intellectuals for whom “passionate lives subjectively expressed through public service invite *self-understanding through self-overcoming* [emphasis added]” (2009, p. ix). Seligman sees complexity theories as “buttress[ing] analysis against those who call it [psychoanalysis] unscientific... as well as those who damn analysis from the point of view of a correspondence theory of empiricist verification” (2005, p. 291). I believe that, like psychoanalysis, teaching, another impossible profession, can find in complexity theory and psychoanalytic theory, forceful allies to disrupt the particular narrative rigidity—a salient case of what psychoanalyst, Donnel Stern (2003, 2010), terms dissociation in the weak sense¹⁵⁰—of that ever-oppressive tale of mechanistic expectations for human production with all the formulaic, prescriptive guarantees that hold (and thus, scapegoat) schools and teachers as “accountable for the people they produce” (McClintock, 1971, p. 177).

¹⁵⁰ “Ah yes; man is a teachable animal—*animal docilis*” exclaims McClintock (1971, p. 180). Tragically, the past 100+ years of government-mandated and management-informed education have accelerated and exacerbated practices that reach back to the Renaissance or before (McClintock, 1971, p. 180). Out of myriad causal trajectories (as is necessarily the case when it comes to life’s historied unfolding) common myths of education today depend upon continued repression (which is to say, at the level of the cultural, and into the everyday, a clinging to ignorance as bliss, supported by the dissociative insistence to leave unstudied and uninterrogated potentially disturbing histories). That convenient myth—sustained by the refusal to inquire, to consider, in short, to engage in study on the matter—holds that teachers and schools are solely responsible for the nation’s learning. What has been dissociated in the present nightmarish “erasure of academic freedom” is that “teachers [in ‘gracious submission’] are the victims of displaced and deferred misogyny and racism (Pinar, 2004)” (Pinar, 2009, p. 153, n. 10). But, as Pinar pointedly states, “some mistakes are not ours. The exploitation of public education as a political... issue after Sputnik’s launching in 1957 is a calamity we can lay only at the feet of politicians, even the apparently well-meaning kind” (Pinar, 2009, p. 9). To which I would add, narrative rigidity (as Donnel Stern’s dissociation in the weak sense, 2003, 2010) is less about being well- or ill-meaning than it is about a distinctive lack of fortitude, humility, and trust that in self-examination and effortful study we might find ways to live fuller, more gratifying lives together. In short, perhaps such refusals to learn how things might be otherwise evince conditions of tragic pervasive cultural narcissism. Let me be clear, I do not invoke cultural narcissism in the sense of more people walking around with narcissistic personality disorders, but rather I point to a certain heterogeneity of culture whereby the collective ethos is unable to, or flat out refuses to, grow beyond itself because it negates the existence of any difference of value beyond its limits.

This voice of “complexity” from the sciences (with all the strange legitimacy, and illegitimacy-as-unwarranted-privilege, the term “science” seems to carry these days)—if thought to speak with psychoanalysis to pedagogy in any sense—speaks to a pedagogy of return to an understanding of learning as self-formation in and through a context of engagement with the difficult—one’s subjective *becoming with* a social, cultural, biological world—where, after all is said and done (the said and done entailing *a priori* enabling constraints of socio-cultural contexts and historical paths of that self to each present moment), the learner is ultimately the determining site of that which is learned, with or without the facilitating presence of an erudite teacher.

In *Getting to Maybe*, a book “about the art, the science and the experience of possibility.... whose bold purpose is to change the way we change the world” one finds again and again that “*change seems to be a process that can be tapped but not muscled* [emphasis added]” (Young , p. ix). The differently approached insights arising out of complexity theory affirm those that briefly emerged out of Anna Freud’s work as early as 1930. Her *Movement for a Psychoanalytic Pedagogy* came to be an abandoned project, foundering, not only because of political events at the time “but also because there was a failure to articulate the special characteristics of the schools involved.... [In particular, the project] focused on ways of avoiding excessive control of children, rather than developing a theoretical framework for education” (Brown, 2008a, p. 25). Psychoanalytic theory and complexity have the potential for a strong alliance supportive of the primacy of curriculum as “complicated conversation”, where “teaching is not manipulation of ‘motivation’ but a subjectively animated intellectual engagement with others over

specific texts, a ‘characterological enactment’ (Anderson 2006, 3) of passion in the public service” (Pinar, 2009, p. 11).

Like Pinar, I also experience an “imbrication of tradition and innovation” and am too persuaded that the “what” and “how”, known and knower, are inseparable (2009, p. 147, n. 2). In so saying, I reiterate Varela, Thompson, and Rosch’s “enactive approach”¹⁵¹ (1991) as it converges with phenomenology to bring a complexivist gaze upon the life phenomenon of autopoiesis (Thompson, 2007). In this way, I too enter the inseparable worlds of “what” and “how”, known and knower, but through inquiry after the phenomenological “how” and the knower’s experiencing—an approach that cannot but implicate the “what” and the known. Tragically for education, unreflective designations of the “how” have been insidiously at work disassembling the “what” that could be. Accordingly, and with Pinar, my concern is also with the participation of teachers at the interfaces of historically- and culturally-situated selves and others—where teaching, consistent with “the point of view of curriculum theory[,]... is a matter of enabling students to employ academic knowledge... to understand their own self-formation within society and the world” (Pinar, 2004, p. 16).

Violations of expectation

In a surely over-simplistic fancying, my own narcissistic wish has been to somehow become, for Matt, like still water: a crispy clear lake, so that he might see

¹⁵¹ Varela, Thompson, and Rosch (1991) introduced “the term *enactive* to emphasise the growing conviction that cognition is not the representation of a pregiven world by a pregiven mind but is rather the enactment of a world and a mind on the basis of a history of the variety of actions that a being in the world performs” (p. 9). Thompson (2007) highlights the enactive approach as explicating “selfhood and subjectivity from the ground up by accounting for the autonomy proper to living and cognitive beings” (p. 14). With phenomenology, he adds that “subjectivity and consciousness have to be explicated in relation to the *autonomy* and *intentionality* [emphasis added] of life, in a full sense of ‘life’ that encompasses... the organism, one’s subjectively lived body, and the life-world” (p. 15).

himself reflected there, but not exactly and never just him. I want to enact contingent mirroring that is sufficiently marked (i.e., identified as not mine, but as his act given back to him with a marked difference) and containing. Tony Brown drawing from Bion, extends Winnicott's notion of holding, to describe the teacher as container:

To be effective, the container must be neither too rigid nor too porous and unlike Winnicott's notion of *holding*, containing/contained is always a dynamic state, never passive.

To (re)turn not-yet-thoughts into thoughts and images which can be worked on by the learner requires the teacher to be available to function as a container when needed. Holding the material of not-yet-thoughts for learners, may free them from feelings of being overwhelmed. Returning the not-yet-thoughts at a later stage and in forms that offer descriptions, labels and names, permits the learner to construct images and thoughts around what could previously only be felt as dangerous, exciting, important or incoherent. (2008b, p. 101)

Is this what I do that works when it works? I believe so, but there is something else, something beyond teacher as guardian over safe havens for creative play and illusion. Recall Winnicott's descriptions of the mother and educator as both providing opportunity for illusion and as instigating the weaning that is disillusionment (1972/2005, p. 17). I return to the still lake's surface to theorise beyond an attuned function of contingent, marked, and contained mirroring. I return to consider how disillusionment is effectuated through me, though not by me.

That which is marked and returned by the mirror, recognised as reflected representation (not the "real" thing) is also refracted representation. Matt does not see to

the depths of the lake. I do not trouble him with my own preoccupations, leastwise, that is my intent—although admittedly my surface cannot but both belie and communicate at multiple levels (striving though I be, in my own biographical self work, hopefully toward less contradictory modes of being with) the nature of my depths. And however secure is my own attachment in the world, and however engaged I might be with mathematics as my own transitional object, I seek to reflect and refract in ways good enough such that the image presented, and accessible to him, offers and contains both the world he knows and the world that will disturb. Brown says, “Education is a potential source of profound disturbance because it demands change” (2008b, p. 97)

Here, Barthes (1980/1981) conception of *studium* and *punctum*, in regards photography, is perhaps useful. He borrows the Latin term *studium* to name that “very wide field of unconcerned desire, of various interest, of inconsequential taste” (p. 27) that one encounters in a photograph when one enters into harmony with the photographer’s intentions; that is, “to approve or disapprove of them, but always to understand them” (p. 28). Barthes describes the *studium* as a “kind of education (knowledge and civility, ‘politeness’) which allows” (p. 28) the observer to “discover the *Operator* [of the “camera”], to experience the intentions which establish and animate his practices, but to experience them ‘in reverse,’ according to my [the observer’s] will as a *Spectator*” (28). In a metaphorical sense, Barthes’ *Operator*—as I, the teacher—re-invokes the act of the mirroring mother who re-presents a world view as an image of self with/in world reflected and refracted. Unlike the camera’s stilled capturing and re-rendering, the mirrored image proffered by another is fluid.

In the fluidity of a world thus re-presented, as considered in Barthes' *Camera Lucida*, there is unpredictable, wily *punctum*, a second element to break (or punctuate) the *studium*. Barthes observes,

This time it is not I who seek it out (as I invest the field of the *studium* with my sovereign consciousness), it is this element which rises from the scene, shoots out of it like an arrow, and pierces me.... A photograph's *punctum* is that accident which pricks me (but also bruises me, is poignant to me). (pp. 26–27)

I imagine an ideal where, within the shifting imaging of singular-plurality of self in world, Matt experiences himself as enough *in* the picture *with* mathematics to allow a registry of its lack (a lack within mathematics as object of desire) that also returns a disturbance of self as *punctum*—that nagging oddity and disjuncture to work a question and a curiosity. Donnell Stern observes:

We cannot observe the other's self-state directly, but only through its effect on us; the other's self-states are visible only as a consequence of their impact. Similarly, we understand our own self-states, and shifts in them, from what we can sense about changes in our ongoing, conscious experience. (2010, p. 52)

Insofar as this is the case, I understand my role as one of noticing (& interrogating/prompting after) not the *punctum*, but its presence as reflected back to me through Matt. Here is an exercise in schooling his self-awareness, in as much as I can be aware. In the doing, and in this thinking about doing, I remind myself of the ways in which it is not only I who mirrors, it is he as well. And again, we are each and both student and teacher sharing a mutuality across an intermediary space of thirdness.

9 Giving Audience in Fathomable Small-Theatres of World

One Fathomable Small Theatre

I am seeking your help if only by having an *audience*. Call it help through *visibility*. Everyone ought to have the gift of an audience. (Lissa D'Amour in an email to Brent Davis, August 26, 2012)

If I could describe the richness of learning that has characterised my life's fullness—all the becoming and unbecoming through which I am in this present moment—I would speak of audiences given, in fathomable small-theatres of world. I recount a most memorable such theatre, its refrain still and always buoying me into resilient peaceful belonging: I remember sacred childhood places, sitting cross-legged, pondering my mounded blueberry treasure before me while open hands, on either side, idly skimmed smooth, warm, creviced earth, scattering the ochre and khaki needles here and there. I remember training eyes, upwards from the quiet, along soaring evergreens zooming through periwinkle light on sky-pointing expeditions and then I remember catching a squirrel's fluid scampering and the surprise of her fearless leaps—nutmeg-fur shawl-tail, perky and impudent. I remember marveling.

I can still taste the breathless scent-of-sun on face and body, me luxuriating in that unbearable melancholic sweetness of life's uncontainably-containing embrace. I find and lose myself in returns to these fleeting stillnesses, over-ripe with movement. I contemplate in my mind's eye, the sun speaking her lazy scolding to meandering clouds. And like those clouds, I too drift, across the intricately exquisite, the majestically spell-binding, and all the life rhythms betwixt and between. I have been practicing at noticing.

And then, there have been, are, and will be the many moments of springing to my feet to twirl, and twirl, in echoing revelry.

Such places describe first-remembered illusive small-theatres—self-sustaining gifts that stay with me—where I gave audience to the world and received audience to be, and continue to become well with that world. The scripts for those moments, were fashioned from much earlier and older pre-places—in pieces of stories historied through bodies of ancestral being, and being with, and then played out anew in a next iteration that would become and was me. Maturana and Cerden-Zöller describe structural determinism not as an ontological assumption nor as an a priori explanation. They speak, as do I, of “an abstraction from the regularities of our experiences as we operate as the kind of living systems that we are as human beings, and that we make as observers as we use our experiences to explain our experiences” (2008, p. 22). Accordingly, I understand scripts written into and as my body, not unlike human bodies before me, but subtly nuanced according to the particularities of my experience, especially in such co-occurrences as, for instance: The melody of a mother’s voice, her familiar scent, the warmth of her embrace, the languish of suckling, and a nebulous expanse beyond. These illusive beginnings, having left particular tracings in the patterns of my physical being—literally through the co-firing of associative neural and experientially networks—describe the conditions of a beginning presence to and of myself and to and of a world with that mediating first other.

My infant body arrived instinctually primed—and that was its genius (see Chapter 4 & 5)—to partake in those first dialogical exchanges of audiencing in a relationality of emerging co-presence—a “me,” as human being of, in, and with a world that could and

would strap and bundle ordinary, chaotic, perceiving sensitivities into orderable, “languagable,” conceiving sensibilities. As thus historically-conceived I am a structure determined system, of the kind that Maturana and Cerden-Zöllner write:

All that we distinguish arises in our structural dynamics determined by our structural dynamics, and not according to any external entity that an observer may see impinging on us. Our feeling of existing in a domain of independent external entities is not denied, but the explanation of this feeling is not that we indeed have the ability to distinguish external entities. (2008, p. 35)

Importantly however, I am also a partial component of a larger structure determined system—an effect of which places me inside that ecology. And so there is paradox here, all the way up and down.

Yet, it is in the sense suggested by Maturana and Cerden-Zöllner, that I speak of my illusionary beginnings—these self-fashionings having made possible a particular world to come into view. It was a world prompted by something “out there” to which my biology chose its response, and out of which I made a knowing of myself as my self knew to do. Henceforth that knowing—though never quite identical in itself across time, yet sufficiently so for continuity—would increasingly come to both enable and constrain that which I might subsequently construe into perception, and this would be the case even as the world would continue to interrupt or affirm the interpretations thus taken. And all of this happened in and through the interplay of not-so-fixed dynamical structures of worldly ecologies—emergent life forms somewhere between cosmos and chaos.

I continue to be in awe at the miracle of this flux that is life.

Co-Presence and a Space of Thirdness

To give audience emphasises listening to and witnessing, not only the learner but also the script as played upon and with by that learner with other learners. As teacher, I understand myself as moderator of the degree of structure and laxity in the scripts, scores, and choreographies given as objects of play and thus constraining the play of the system. I aspire to do so in response to the learner, in as much as I have listened and witnessed both the learners in my charge and the larger cultural collective pressing particular learning and on whose partial behalf I also act—though always with some modicum of skeptic criticality.

In speaking of listening, I draw from Davis' *Sound Alternative* (1996) and a listening that is hermeneutic in sensibility. In such teaching a conflation of roles occurs: The teacher's task is no longer "ensuring that learners converge onto some pregiven understanding, nor as honoring the subjective constructions of thirty ostensibly autonomous agents" (p. 262). The teacher is instead complicit in the subject matter as "participant in the exploration of this piece of mathematics" (p. 262). Through such listening community becomes that which establishes standards as collective authority takes shape. The teacher opens "a space for the shared project, the conversation... [in teaching that] is participatory, transformative, concerned not merely with questions of knowing and doing, but with questions of personal and collective identity" (p. 262).

The metaphor of a theatre—as a place awaiting sound and movement, a place of listening and witnessing in gestures of mutual presence—describes a holding environment shaped by the pedagogue for the purpose of giving audience. Here, secure enough, in the absence of care—as sorrow, anxiety, or grief—the learner can practice

discernment while trusting in a buttressing, buffering, containing presence of the teacher. Here the crises of self-change across tipping points are not catastrophically critical. The teacher tends and attends, where tensions of stretching and holding are complementary, construing, artful acts to encourage the dialectal enfolding of manifold disciplinary scripts as encountered incoherences and ambiguities work a resolution into multi-textured structures of knowing—all of which happens in a discourse of deepening multiplicity of selves with and through curricular object.

In secure-enough theatres, learners play at scripts, loosening and creating anew with/in the particular discipline-as-absent-playwright. In a sentiment of sharing, a cultural consciousness arises out of the materials afforded by these “theys” of, for example, social studies, mathematics, science, language arts, music, physical education, and so forth. The play *is* the play of structure, the movement within the discipline. And the fluid pedagogue is he who understands, as in has lived in, the interconnectivity of the discipline. Such a pedagogue is expert but one whose fluidity makes possible being in and with the mind of the novice—enacting through layered metaphor especially, resolutions of novice to expert ambiguities. The pedagogue prompts the learner to particular noticing, launching the student into the structure where each noticing and microscene serves as a subtheatre that both enables and constrains. In the mirroring markedness of the pedagogical and disciplinary teacher (both present) the learner grows aware of self-knowing—observing, contemplating that self, imagining and imitating and then infusing imitated purposeful enactments into held memories such that he might imagine beyond the moment.

I am aware that, the teacher who bears witness, does so in myriad mirroring ways, after the natural human pedagogy. Core for me is to resist the tendency to construct that

arises out of assumptions of the other as projections of the self. I continue to grapple with my own “*curse of knowledge bias*”—the assumption that “if one knows something about the world... everyone else knows it too” is alive and well in this adult, indeed! I play with irony, humor, and skepticism in ways that Lachmann describes and Matt plays too. I understand these as evidences of a rhythm of a *being with*.

The inclusion of irony, humor, and skepticism provides a balance when the mother mirrors her baby’s distress.... [Its] inclusion “ensures that the infant recognizes [the mother’s] emotion as analogous, but not equivalent, to their experience” (p. 94). Without such useful ‘contaminants’ of the mother’s perspective within her mirroring of the child’s anxiety or distress, the mother’s response might simply reinforce the child’s anxious state. (Lachmann 2008, p. 89; citing Fonagy & Target 1998)

And so, to bear witness and to listen is to resist the temptation in one’s world-making to be other-making and other-controlling. It is about extending trust, that self-same trust that I in, even this present work, have thankfully felt from my teachers. To bear witness in mindful listening and mirroring is to give audience in participatory ways, to model play, and to perturbate through the script as intriguing artifact from world.

There are tests too, but these come as celebrated performances into world and they are indeed “demanding” but not preemptively so, that is, not prior to the play of and with meaning. Mastery comes with owning the play, as being fully within it, inhabiting it, but also understanding it in its readiness for world. Thus the play’s stories move the learner from pretend make-believe (imaginative intellectual play) to a representation of/from something that approximates a shared real, but still is not that. Schools as such

theatres are thus places of play and of work where work is the effectuation of motion and of being moved.

In this metaphorical theatre too, the enabling constraints within which the learner learns are structures, imaginable as extracted nodes, taken from a disciplinary system that is likewise given for student re-making with/in particular situated theatrical contexts called schools. In the play of these structures—and not from the pre-emptive demand for finished performances (although never-quite-finished performances will come)—sense-making arises as participants negotiate fitness to context with other players including co-actors, directors, audience, lighting crew, set designers, make-up artists, costume designers, and so forth. All of these players have their metaphorical counterparts in and around classroom learning ecologies that together set the tenor and flow of the play and what can and does come to be learned.

In terms of a dialectic model of learning as autopoietic becoming (Figure 3), the script brings in the world as transitional cultural object in ways that provoke. It is the script that disillusiones and the students work newly experienced ambiguity, through play, with that script, resolving it into recursively revised illusions, these accommodated to the newly experienced perturbation. It is the sense-making of scripts that entails the learning had in the play. And the manner of that path subsequently cascades into an answer to the question: “What next?” as students and teacher traverse the curricular text. Baldino and Cabral capture well the sense of this process:

Listening means to let oneself be hypnotised by what the student says, to follow his/her reasoning up to the point where we can say: Aha! Now I understand what you are saying. At this moment, the teacher can make an intervention, make a

question or suggest a way out.... *select[ing]* what we hear from the student so as to keep it within the bounds of the mathematics classroom and to constantly rebuild the insertion of the mathematical object between student and teacher. (2008, p. 78)

Important too, in my invocation of a discourse of theatres is my desire to push back against a present rhetoric of authentic learning, authentic assessment, and authentic practices. I do not know what inauthentic learning, assessment, and practices could or would be, other than strange oxymorons. Matt is pressed too quickly to the finished product and does not invest himself in its production. The authenticity of a finished product, though sensible were schools factories, makes no sense in the context of the theatre. Authenticity feeds too readily into Matt's preoccupation with responding to the interpellation of self, a self he could only produce in hiding, and ineffectually so. I rather envision schools and think of my work with Matt, as sites of serious play—not unlike tiger cubs playing at subduing future prey—where students are provoked, supported, and yes do incur (happily so) the occasional non-life-threatening scratch.

Pretend, not pretense, is the proper context for sense-making. In pretend one can risk vulnerability. In pretense one masks it. In giving audience, as I imagine it, a teacher's unpretentious presence opens and directs attentions to the presencing of a learner in ways to legitimise, acknowledge, and render visible the learner's grappling, even and especially to that learner's self. In demanding performance there is the sense of an interpellation, a calling into being of that which is presupposed to exist. The demand to perform is other-constructing. When inappropriately, which is to say preemptively

expected, it forecloses being and becoming with, and constitutes instead the conditioning effect of minimal selfhood.

Now, all of this is not to say, nor to be twisted in one way or the other into convictions as regards the absolutes currently ricocheting in present quarrels around evaluation and assessment for, of, or as learning¹⁵². Pretend play has consequences and we would do well to understand these also as in the realm of pretend. It strikes me that the panic around assessment, the desire to press Matt through hoops, or more aptly fragmenting sieves, arises out of an anxiety born from the weight of the world. One must grant audience for sense-making in a holding environment where students explore legitimate peripheral engagement with a sense of inquiry. It is not my experience that students choose to avoid perturbations when they are at liberty to grapple with them. It is instead the experience of someone looking over one's shoulder awaiting a response that provokes anxiety.

Playful cubs do garner scratches, but let them be the scratches given and taken in the grappling with the transitional object, in this case mathematics. When Matt gets an assignment back and refuses to look, he cannot tolerate the scratches because they do not come from the mathematics. They are scratches given by an absent ever-present judging Other. Later when he gets assignments back and the first thing he does is explore the where and why he went wrong, that signals something entirely different. He wants to know about the lack, the space between his understanding and the object of desire. In so

¹⁵² I cannot but mark a notable irony in these words. I muse at the practice of changing a word, to change a practice. It is in this way that what was once called evaluation was refitted to something supposedly different called assessment, and how subsequently the two words operate as synonyms. Another such inertia in meaning is evidenced in the movement from mentally retarded, to mentally handicapped, to mentally challenged. The authors of these shifts may have been well-intentioned, but the public meanings just moved along to the new words. Now why do I find that mildly entertaining, in all its naivete? Of course, I do participate in the same language game with my words, don't I? Indeed!

doing he feels the *jouissance* of his never-ending circling round mathematics as that alluring entice in whose pursuit he can feel himself alive.

To be sure, as knowing is refined, then that which is learned is practiced and finely tuned against, progressively and recursively, the edges of the real world. Neither am I suggesting that play will not involve rote practice and memorisation. One becomes familiar with the objects of one's play. Metaphorically, the play is ultimately taken to the streets when ready. Life becomes the play, such that there is an inversion from the "real world" infusing itself in mitigated portions into the theatre of play, to, but also with, the theatre of play coming to be infused in mitigated portions into the real world.

All the while, the expectation is that in apprenticeship, students participate in the making of a personal sense—this happening in collectivity with each other and through the transitional object, for it is in collectivity with culture that we, at once, come to understand the sense of what is culturally given by a larger collective world. As such there are moments of improvisation and script writing too, where on occasion and increasingly so, participants are invited to play at joining in with that larger collective and at participating in the recursive process of rewriting these cultural scripts themselves. This is especially the case as they gain familiarity with the nature of this or that playwright's work, this or that disciplinary discourse. All the while, the teacher does not demand performance, instead performance emerges out of effortful engagement—out of pursuing the lack and the *jouissance* in experience. Eventually, the teacher makes of the theatre an open-air space. Buttressing walls are progressively dismantled as worldly scripts infuse the theatrical scene, even as the actors work to make poets of themselves, taking with them theses histories-of-being-found-visible that they may be present giving

audience subsequently with and to world. The theatre transmutes bit by bit into life as and in world.

This notion of fathomable small-theatres of world I contrast to that of demanding performances as instances of production: To what extent does the mathematics of schooling, as it presently exists, ask, demand, and interpellate the child, but also and significantly the teacher (as cited in as much as there is not pushing back) into a performance, as an expectation, of impossible, anticipatory participation in a particular fiction of singular truth? How can such a demand, such a “being done to” not but produce anxiety? Moreover, for the already anxiety-ridden child especially, this demand re-instantiates a lose-lose game of preoccupation at mind-reading the Other, effectuated through mind-losing (dissociating, or leaving unformulated) the self. Put in terms of mirroring, this Other of mathematics, mediated through the teacher, enacts a mirroring that is neither contingent, marked, nor containing. Instead, it blankets a façade upon an effaced child who, not unlike Narcissus, is pressed to seek outward narcissistic supply as that buoying substitute for absences (as unformulated visceral possibilities) within. Here we find the antithesis of what Tony Brown describes in secure attachment patterns enacted in relationships between student and teacher that “reflect shared interest, pleasure, mutual recognition and the ability to enjoy the difference of the other—where the relationship develops as ‘being and being with’ rather than ‘doing and being done to’.” (Winnicott, 1988)” (2008b, p. 110).

From the beginning Matt was called to perform. His was not a world imbued with possibility for play. His parents describe his aversion to performance:

What he hates is the performative parts of the work. He hates that and will skip the class and put everyone else in the group in jeopardy. He does not like to be the centre of attention. He has never been the kind of kid that you could get to do something cute, even as a baby, to get him to do it again. He doesn't want people to pay attention to him in that kind of way. (Sonia, December 14, 2010)

Conditioned as he had been—that every speech act must be a finished product—he did not speak. It is not easy giving audience, listening to anxious silence, and mirroring anything mirrorable at all, to one who begins so invisible. And so across our time together, the silences did shift and gradually, gradually, he began to test the possibility of joining me in play—though always reluctant to lay forth his thinking out there for public consumption.

At that nexus, where Mathematics as Other converges upon the child, stands the pedagogue, teacher, tutor, whose function can be thought as not unlike that of the attuned mother. According to Baldino and Cabral, and following Lacan, for mathematics to become object of desire, in and of itself, for *jouissance* to be experienced in mathematics, then it is mathematics that must needs be experienced as having a lack (2008, pp. 76–78). Their fictive character, Diaphany describes her “special kind of enjoyment”, her *jouissance* at finding a lack in her teacher who represents “the big Other” (p. 68). She says, “My true object of desire was behind all this. It was the principle that made me the desirer of a lack situated precisely in Mr. Smith’s face when he vacillated” (Baldino & Cabral, p. 68). For curiosity to know itself in mathematics, the child must come to know and desire the *jouissance* of play in mathematics’ lack; that is, where mathematics as transitional phenomenon can be experienced as an as-yet-unquestioned and never-to-be-

completed possibility of playful pursuit of a lack. Where mathematics is the interminable object of desire, curiosity is born of its pursuit and in the doing of that pursuit one sees oneself and likewise experiences oneself as seen. The teacher, as good enough, as attuned enough, holds at bay the question of reality, just so, and in the doing makes possible a reprieve, a fecund ground of thirdness wherein and within which the child of us can play in/at the singular-plurality of existence.

If I could name the preemptive signals of his shift to understanding and ownership, it was in a momentous shift in demeanour. Interestingly, that shift passed first through something younger. I witnessed and gave audience to the Matt who wanted to linger after a lesson to teach me how to play Magic, who brought his favourite music for me to hear, and who interjected, haphazardly, into the mathematical space for a period of a month or so (at a minimum) all manner of digression to curious creatures, play characters, and the kind of behaviour reminiscent of my sons when they were much younger. It was as though he had to be accepted as a child in order to step into his adult self, and so I participated as that audience too. It seemed to matter and it was not so much for me to decide.

Milner describes Winnicott's playfulness and his conception of "creativity as not simply perceiving, but as deliberately relating ourselves to our perceiving" (in Milner, 1972/1987, p. 250) and a sense of self that "comes only from desultory formless activity or rudimentary play, and then only if reflected back... [I]t is only in being creative that one discovers oneself" (p. 250). I recognise that Matt is not yet there. We parted and he was not yet there. Desultory formless activity or rudimentary play is what he saw me enact, it is what he approaches though at times a cascading of play seemed imminent. A

year ago, my prompting was routinely met with lengthy silences. At the time of my leaving, Matt actively self-explored. The shifts were gradual, but definitive, and never linear.

And so, the Matt I worked with began as a teen, explored himself as boy, and then returned as young man set upon success in terms of moving through mathematics and less so sneaking by unseen. With/in the curricular playground of this once-bullying discipline, a depth work of learning the self has begun—precious and momentous turns indeed.

In “From many into one: Attention, energy, and the containing of multitudes”, Jessica Benjamin (2005) considers the “work of living with contradictions—life” (p. 185). She locates these in the tensions of “openness and closure”, “resolution and receptivity”, and “accepting the presence, the necessity, of countervailing forces, living with, not eliminating contradiction” (p. 196). The voice for which she strives would weave between “union and dispersal, the one and the many... com[ing] from the place of the third.... a place... inside, below, in between, from which to experience contradictions (another way of thinking about Winnicott’s [1971] transitional experience)” (pp. 196–197).

In my work with Matt, I experienced a similar striving. I also sensed a fluid lapsing into and out of what I understood (or perhaps wanted to understand) as this transitional third space. It existed, for me, as an emergent “unfoldment” taking shape in dialectic conversation where each prompt prompted an-other and a threading worked its interweaving across the given and the made; that is, what we took as given and what we made of that taking. I think of this discourse as at the “interplay of edges” (Winnicott in Milner, 1972/1987, p. 247) that touch (of tocar and take), overlap, and miss (as of

mistake) in an intangible, unquestioningly comfortable flow—“play as transcending the opposites of serious and non-serious” (Milner, 1972/1987, p. 248).

This is the conviction of what I felt existed in our work but it was not always there. In the beginning when I listened to our recordings, I heard myself struggle with that sort of listening and I would, in the listening, perform my own self-disillusionment in witness of a seeming off-centeredness of this space of thirdness between us: Not the first time that I wished for more silence of myself. Yes, I heard fluidity, a rhythm of understanding with, for example, sentences, in later conversation, each completed almost imperceptibly one with the other. I heard engagement in tone, pauses, and interjections. Yet, I thought almost always that I heard, too often, my voice over his. And I wondered and continue to wonder again about the good enough mother, not too preoccupied, not too absent, shifting away so that the child inhabits his own strength, and then returning in attuned fashion to steady and contain. And then, of course, I realise that there were, are, and will continue to be times when I have been too busy filling the awkwardness, the anxiety-filled spaces of silence. But I grow in mindfulness too. Thankfully, I only have to be “good enough.” Across my some 30 years of teaching in schools I have regularly marveled at and been thankful for that truism.

I wonder about the space of thirdness, silences as openings that in their disconcerting nudity can be both deafeningly silent and over-busy with preoccupied thoughts—openings as uneasy disturbances, that I am too ready to cover over, to fill, with my own acting. Lacan’s words do echo: “To act, is to operate a transfer of anxiety” (as cited in Baldino & Cabral, 2008, p. 78). In the earlier audiotapes, I had wanted to hear his voice, but at the same time I was anxious to protect him from his silence and his noise. So

in those moments, ought I to have spoken for him? When I asked him if this is what he was thinking, if this is what he meant, did I ask and say too much? I worried, which is to say that I cared (see Van Manen, 2002, for an apt discussion of “care-as-worry”¹⁵³), about the ebb and flow of a pedagogy wanting an emergent capacity to play creatively with/in mathematics. It was both a precarious and a robust thirdness that grew, and I was often unsure as to who was the teacher and who was the student. In this self-questioning, I also notice the chatter of my own voice. It drowns out my own presence. I approach a peaceful silence.

Over the course of our two years together Matt came to be less frequently tired and less frequently ill. Though fatigue tended to return in concert with pressures to perform before he was ready, it was a fatigue that became increasingly more fleeting. He recovered quickly and well. I felt a resilience growing in him, its presence in the end irrefutable. With these shifts, Matt’s voice became more audible, both literally and metaphorically, throughout the recordings. There had been a time when, if I had had the window open to outside noise, I could be assured that neither I nor the transcriber would be able to discern his words from the tape. Indeed, many a time, even surrounded by silence, I still could not make out what he was saying. Yet gradually I came to hear him clearly, even over the loudness of incessant traffic outside. With the change in voice, so

¹⁵³ Through Van Manen, I understand care as being enacted in a willingness to trust the other, to strive to meet a respected other in her true otherness. To watch and support the struggle of an other, rather than to *do for* the other, is to live and feel one's worry. Although not limited to this interpretation, the notion of living with care-as-worry resonates for me with Baldino and Cabral’s (2008) aphorism that “*maths anxiety is not to be avoided, it is rather to be love*” (p. 72). Strangely, in an economy dependent upon reported measurables one risks being perceived as *not* doing because one does not care. I am advocating, not doing *because* one cares *and* one trusts the other's life force, the designs of that other as worthy. In short, one respects that other. To be done for, when one can do for oneself is *not* an expression of care, especially when the act in question is one of self-construal.

too came a shift in demeanour. Movements were crisper. Ponderings seemed deeper, more engaged. Rest was more restful.

How uncanny, that though I just described Matt's shifting self, so too have I spoken my own truth. Listening to the final audiotapes of our time together, I hear again the silences. But they take on a different meaning and tenor. They are peppered by subdued conversation over these mathematical objects. His focus, like mine in this dissertation work, holds for hours. He is present with the work. I am present with mine. I have enjoyed a different audience, but one the same. It has been the audience of my supervisor, and so like Matt, I too play quietly present in and with world. I had become redundant to Matt's learning, though I expect we each will always be silently present to the other through the many. This is the gift of audience.

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