GOVERNING RISK, EXERCISING CAUTION:

WESTERN MEDICAL KNOWLEDGE, PHYSICAL ACTIVITY AND PREGNANCY

by

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Abstract

In contemporary Western society, the messages regarding exercise during pregnancy are conflicting and confusing. Long-standing cautions about the dangers of over-exertion intermingle with entreaties to engage in moderate physical activity in order to have a healthier baby with a reduced risk of developing various chronic diseases. These medical messages then co-mingle with advice from family and friends as well as with images of the fit, pregnant 'yummy mummy' circulating in popular culture. The purpose of this dissertation is to trace history, untangle meanings and demonstrate shifting 'truth' claims about the active pregnant body, also considering how the various messages in circulation might be experienced as simultaneously empowering and oppressive by their intended audience, the pregnant woman.

With these goals in mind, I draw upon the Foucauldian tools of archaeological and genealogical analysis to examine how knowledge regarding exercise during pregnancy has been produced over the past century, and how the messages put forth by the medical profession (and circulating within consumer culture) have functioned to regulate the activities of pregnant women. I also enlist the analytical tool of 'governmentality' (Foucault, 2003; O'Malley, 2008) to examine the place of exercise during pregnancy within the larger governmental apparatus of Western society over the past century.

This approach provides a key insight as to why the ideas and messages about physical activity and pregnancy are so confusing: since the late nineteenth century, exercise during pregnancy has been framed as both a problem *and* a solution to the larger biopolitical aims of governance, aims which themselves have changed from a concern with the collective strength of the nation-state to a (neo-liberal) concern with the cost of unhealthy bodies. By situating maternal exercise within the larger governmental complex and closely examining the 'rules of formation' that allow particular statements (at certain times) to be accepted as 'truth' or 'knowledge' as well as showing how these 'truths' turn into a form of practicing power, my project illustrates the contingency of ideas regarding maternal exercise and troubles taken-for-granted ways of thinking about the active, pregnant body.

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Dedication

To my mom

CHAPTER ONE

Introduction

About a year ago I received a phone call from one of my friends who was approximately three months pregnant with her first child. She was aware of the topic of my dissertation research – exercise and pregnancy – and wanted my advice about weightlifting: was it alright to perform overhead presses and how much could/should she lift? It seems that she was getting a variety of advice from different sources and she was confused and anxious. Her mother told her not to exercise, a few of her friends expressed surprise that she was planning to exercise throughout her pregnancy and when they were at the gym together her husband chastised her for lifting weights that he deemed too heavy. Meanwhile, her physician told her to listen to her body and do what felt right for her. Adding to her confusion was the mountain of popular health and fitness literature encouraging her to exercise (in moderation) to have a healthy baby. My friend also bemoaned the fact that after only the first few months of pregnancy she could not fit into her work clothes and explained that she wanted to exercise so that she could continue to feel good about (or at least not hate) her growing body. Why did exercise, something that is potentially pleasurable and empowering, give rise to such feelings of confusion and anxiety? The aim of this dissertation is to explore, expose and begin to untangle some of the meanings which have been attached to exercise during pregnancy in Western society by examining their construction over the past century and, by extension, the subject positions offered to women.

The project is based on the premise that medicine and culture are inextricably linked. Medicine – as a central social institution in Western societies since the nineteenth

century – plays a key role in shaping how we understand ourselves, our bodies, the world we live in and the way we act in it. Alternatively, culture shapes medical (and scientific) views and opinions, influencing the questions that are asked, the research that is carried out in the medical context and to a certain extent, the answers that are 'discovered.' That is to say, medicine is not an objective and neutral endeavor but is informed by social issues and concerns. Feminist scholars, for instance, have illustrated the ways in which, from the late nineteenth century onwards, members of the medical profession expressed anxiety about the potential ill effects of vigorous exercise (and particular sporting pursuits) on female reproductive organs, suggesting that women restrict their physical fitness practices to ensure that they may fulfill their 'natural' roles as mothers (Verbrugge, 2002; Vertinsky, 1988; 1994). In this view, it is important to analyze medical discourse about health and physical fitness practices (and how this knowledge is taken up within society) because such knowledge is inextricably linked to networks of power, shaping women's reproductive experiences and overall state of health (both physical and mental).

While the discursive field of exercise and pregnancy throughout the past century is the primary focus of this project, the starting point for my examination is the late nineteenth century. This was a crucial moment in the development of Western medicine, a time when the Enlightenment ethos of reason as the primary source of authority had firmly taken root. As 'rational' or 'scientific' thought became the dominant way to view the world (including the notion of the 'body as machine'), the male medical profession gained credibility and legitimacy over alternative approaches to health and the body, allowing them to claim expertise in solving many of society's problems (Arney, 1982;

Mitchinson, 1991; Vertinsky, 1994). As Vertinsky (1994) cogently articulates in her investigation of doctors' exercise advice to women in the late nineteenth century:

> What physicians, from their perspective as experts and rightful knowers, had to say about women, health and physical activity had an important impact upon the lives and outlook of middle-class women and provided a legacy which has had a lasting effect throughout the twentieth century. (pp. 7-8)

To be sure, late nineteenth century medical statements were "precursors to and analogues of" (Arney, 1982, p. 21) many of the ideas about exercise during pregnancy that circulate today (for example, the notion of 'training for childbirth,' being 'fit for two' and vigorous exercise as dangerous). At the same time, however, the landscape of prenatal exercise has changed over the twentieth century, shaped by shifting social norms and emerging cultural issues. The prenatal movement, the natural childbirth (or 'training for childbirth') movement, the women's movement of the late 1960s, the health and fitness boom of the 1970s and contemporary fears of an 'obesity epidemic' are just some of the social factors that have shaped ways of viewing the issue of physical activity during pregnancy and the advice provided – or withheld. In her cultural history of pregnancy, Hanson (2004) similarly suggests that social history is imprinted on the pregnant body, explaining that the pregnant body is doubly mutable: "It is mutable in the obvious sense that it undergoes continuous physiological (and sometimes pathological) change, and mutable culturally, in that it is viewed through constantly shifting interpretive frameworks" (p. 3).

Despite changes in the way that we have come to understand the pregnant body, one constant has remained throughout the time period of my investigation: societal anxiety about the reproductive body and the need to delimit proper physical activity (along with numerous other lifestyle behaviours) to ensure the health of the mother and fetus. And by the latter half of the twentieth century, the focus of advice around exercise

had, in many ways, shifted to the fetus. On one level, then, this project is about exercise and pregnancy, but at the root it is about the anxieties and concerns regarding the reproductive female body - especially the pregnant body - that pervade Western society. Indeed, "as the mechanism by which society reproduces itself, pregnancy is by no means a private matter, but is peculiarly susceptible to social intervention and control" (Hanson, 2004, p. 6). From the late nineteenth century onwards (and in varying degrees), reproduction has been viewed as crucial to the health and strength of the nation-state – although in contemporary culture the focus has shifted from the collective strength of the 'nation-state' to a concern with the economic cost of unhealthy bodies (Rose, 2001). It was in 1901 that British physician J. W. Ballantyne published an influential paper in the *British Medical Journal* that introduced a new way of thinking about prenatal care - 'antenatal therapeutics.' That is, the idea that the fetus could be treated through the mother. This way of thinking gained such influence over the course of the twentieth century that many feminist scholars argue that in contemporary Western society, the fetus is now the patient and the pregnant woman merely the carrying case, an obstacle to physicians' efforts to treat the 'real' patient (Lee & Jackson, 2002; Wetterberg, 2004). They suggest that we live in an era of 'intensive motherhood' where the pregnant woman is under ever-increasing pressure to regulate her behaviours and avoid numerous pregnancy risks so that she will not only have a healthy baby, but a better, smarter one (Lee, 2008; Lupton, 1999; Ruhl, 1999). She is required to be 'fit for two.'

Despite this growing body of literature that draws critical awareness to the shifting web of power relations that entwine the pregnant body (and the prominence of medicine and science in this web), there is a striking lack of attention to the interplay of

medical knowledge, exercise and pregnancy. While feminist researchers in the sociology of sport have examined how, from the late nineteenth century and into the twenty-first, medical knowledge about the female body has been used to justify the restriction of women's physical fitness opportunities (Verbrugge, 2002, Vertinsky, 1988; 1994; 1998), there has been little focus on the production and application of medical knowledge about prenatal exercise. Similarly, while there is a vast amount of feminist research on the manner in which, throughout the twentieth century, the pregnancy experience has been increasingly medicalized (Arnup, 1994; Lee & Jackson, 2002; Wetterberg, 2004) and commodified (Marshall & Woollett, 2000; Taylor, 2000; Taylor, 2004), there has been virtually no investigation of physical fitness practices in these processes. In particular, there is a lack of research focusing on exercise prescriptions in the Canadian context.

A close examination of the production of medical knowledge about exercise and the pregnant body is crucial for, given the symbiotic relationship of medicine and culture, such knowledge potentially shapes the ways that pregnant women understand their changing bodies, the activities they engage in during pregnancy, as well as the enjoyment that they derive from them, thus impacting their physical and emotional well-being. The aim of this project is to begin to untangle the knot of statements about physical activity and pregnancy, and in doing so, also pick apart some of the 'truth' claims about the active pregnant body, illustrating how what is considered 'common sense' at a certain point in time could have been otherwise. By demonstrating the contingency of knowledge and the power relations at play in its creation, I hope to bring to light alternative ways of knowing about physical activity during pregnancy, and increase women's enjoyment of exercise during pregnancy.

It is with these goals in mind that the following research questions are pursued: What have been the discursive constructions of exercise and pregnancy and by extension, fit motherhood over the past century and into the present? How have these constructions or ideas been arrived at? (i.e., what are the rules of formation?) How does the larger cultural context factor into medical advice about physical activity during pregnancy? (i.e., how do medicine and culture intersect?) How are the discourses surrounding exercise during pregnancy put to use in the operation of power? How does exercise fit into the governmental apparatus created to manage the risk of the pregnant body and the unborn child?

In an attempt to answer these questions, I combine the methodological tools of archaeological and genealogical analysis. I explain the theoretical underpinnings of these concepts in the following two chapters, but briefly, an archaeological analysis aids the researcher in 'excavating' the 'rules of formation' that allow some statements (at certain times in certain cultures) to be accepted as 'truth' or 'knowledge' and others to be marginalized. A genealogical analysis facilitates an exploration of how these 'truths' or this knowledge turns into a form of practicing power that disciplines individual bodies and regulates the social body. Because archaeology and genealogy are more 'methodology' than 'method,' I also use the following research techniques to further examine the truth claims and power relations regarding exercise and the pregnant body: 1) textual analysis of academic medical literature, government publications (specific to Canada), and popular texts that focus on prenatal exercise advice for women (and were published from the beginning of the twentieth century to present); and (2) interviews with

individuals who transmit or translate this knowledge to pregnant women (i.e., medical doctors and a leading fitness trainer).

The structure of the dissertation is as follows. It begins with a review of the literature in which I discuss theoretical work regarding power, the body and risk, with a particular focus on the ideas of Michel Foucault and his concept of governmentality. This is followed by a review of the substantive literature on exercise during pregnancy and a discussion of the project's substantive, theoretical and methodological contributions. In the next chapter I further describe the methodological approach used to answer the research questions, namely archaeology and genealogy, and then outline the 'nuts and bolts' of the project: the texts and statements that I examined (and why) and how I went about analyzing the data. With this theoretical and methodological background, I then share my research findings which are presented in five chapters.

In the first results chapter I examine the production of medical knowledge about exercise during pregnancy from the early twentieth century until the years following the Second World War (the late 1940s/early 1950s). My aim is to 'excavate' the 'rules of formation' that helped to produce and regulate what was to be accepted as knowledge about the female (reproductive) body, and ultimately, shaped the exercise prescriptions given to pregnant women. This entails examining the wider social conditions that influenced the ways of thinking about and understanding the pregnant body, delimiting what was 'sayable' about its physical capabilities. A central focus of the chapter is how/if the prenatal movement that emerged in the first decades of the twentieth century - and began to shift the meanings and social practices surrounding the pregnant body and prenatal care - influenced medical ideas regarding appropriate physical activity and

exercise practices for women. Thus, a central focus of this chapter is on the development of professional power in the government of the pregnant body.

In the following chapter I examine two groups of 'alternative' views pertaining to pregnancy and exercise which emerged in the first several decades of the twentieth century: 'training for childbirth' and 'sporting moms.' I focus on the relation of these discourses to the mainstream (or 'traditional') medical statements discussed in the previous chapter, and in particular I consider the extent to which they acted as 'points of resistance' to traditional ways of thinking about the pregnant body and its physical capabilities. I therefore use this chapter as a case study to examine and build upon Foucault's ideas regarding power and resistance.

In the 1970s there was a significant change within the discursive field of physical activity and pregnancy: the view of the pregnant body as incongruous with anything more than gentle exercise was increasingly questioned within both the medical and lay community and, in conjunction with the rise of second wave feminism and the fitness boom, the meanings attached to and practices of the pregnant body began to shift. In the third results chapter I examine how this initial shift in the discursive field of exercise during pregnancy was met within the medical and scientific community and, more specifically, the debates that arose – particularly in the 1980s – as medical experts strove to determine the limits of safe exercise for expectant women. I assert that the disagreements about 'how much and how far' were rooted in epistemological differences regarding proper 'ways of knowing' about physical activity and pregnancy. Issues around professional power reemerge in this chapter as I explore the process by which 'pregnancy

and exercise' became a specialized or rationalized area of study throughout the closing decades of the century and into the next.

In the fourth results chapter, I shift the focus from the field of science and medicine to the field of popular culture. I examine the various discourses concerning exercise during pregnancy that are in circulation in contemporary consumer culture and more to the point, how they are put to use in the regulation of the pregnant body. I discuss the types of knowledge or 'ways of knowing' that dominate the popular literature and identify three main concepts or themes, illustrating how they come together to form a group of statements that may be placed under the rubric of 'risk.' The focus of the chapter is on how this 'discourse of risk' fits within the promotional logic of contemporary society, more generally.

While popular literature is an important source of health knowledge in our mass mediated society, physicians continue to play a central role in prenatal care. Therefore, in the final results chapter I examine 'doctor talk' about exercise during pregnancy – that is, the way doctors talk about and construct the issue in their daily practices and their encounters with patients. I explore physicians' knowledge about physical activity during pregnancy, their attitudes towards maternal exercise as well as how they present this information to pregnant women in the course of prenatal care. This chapter builds upon our understanding of the messages that women receive about pregnancy and exercise in contemporary neo-liberal society, allowing for a consideration of how these messages compare to/interact with those circulating in the popular literature. As such, this chapter provides insight into the role that physicians play in the regulation of the active pregnant

body and how 'doctor talk' about maternal exercise fits into the context of neo-liberal society, more generally.

This project is designed to makes a significant contribution to our understandings of medical knowledge, fitness practices and the pregnant body. To date, the discourse of physical activity and pregnancy has been a fractured one, examined by professionals in varying fields or disciplines such as exercise science, obstetrics and sports medicine, and disseminated to women by health care practitioners. What has been lacking, however, is a detailed discussion of the topic which brings together ideas and knowledge from these various realms and examines them through a critical lens of social science, troubling taken-for-granted ways of thinking about the active, pregnant body.

In addition to this broad contribution to our understanding of the production of medical knowledge about prenatal exercise (and the power relations involved in this process), the proposed research will contribute to the sociology of health and illness and the sociology of consumer culture by examining the interactions between the realm of medicine and the health and fitness industry. Although some scholars have explored the appropriation of medical discourse by marketers in consumer culture to 'sell' fitness and health to women (MacNeill, 1999; Madden & Chamberlain, 2004; Markula, 2001), there has been a lack of focus on how medical knowledge is used to encourage pregnant women to exercise in order to be 'fit for two.' My exploration of the links between consumer culture and medical discourse is designed to address this limitation.

This research study also has practical implications. A critical analysis of the symbolic meanings attached to exercise and pregnancy in the realms of science, medical practice and consumer culture promises to aid in the creation of more effective messages

and communication techniques. Considering the central role that medicine plays in most women's pregnancy experience in Western society, the production of more positive and effective prenatal health messages may improve women's subjective experience of pregnancy and the ways they view their bodies. Similarly, examining representations of prenatal fitness circulating in the commercial media may allow for the identification of discursive practices that objectify and/or disempower women, and provide the basis for challenging media producers - with the ultimate aim of constructing alternative (more positive) subject positions for women. Finally, the interdisciplinary nature of this project means that it will be of interest to a number of different groups – exercise scientists, obstetricians, general practitioners, feminist scholars and sociologists of the body, to name a few. My hope is to open up a dialogue between these various groups, offering a differing perspective to individuals in disciplines that might not consider the issue through an historical/social constructionist lens and also sharing medical and scientific perspectives with scholars of the body and feminist theory, more generally.

CHAPTER TWO

Literature Review

This review of literature begins with a general discussion of key theoretical approaches to medicine, power and the body, with particular attention to the approach that I privilege as my theoretical framework: social constructionism. With this background, I then outline the work of Michel Foucault and more specifically, his ideas regarding discourse, truth and knowledge, and his concept of power and its relation to the body. Incorporated into this review is a discussion of how these ideas have been taken up by feminist scholars. Following this, I provide an overview of Foucault's notion of 'governmentality' and how it may be used as an analytical tool to deconstruct the working of power – more specifically by analyzing the inter-dependencies between *political rationalities* (e.g., welfarism, neo-liberalism) and *technologies of government* (i.e., the techniques, tools and means through which 'problems' identified under a political rationality are 'solved'). I provide a brief overview of welfarism and neo-liberalism, the two dominant political rationalities to emerge during the timeframe of my project, and then move into a discussion of theories of 'risk' and 'bodywork,' both of which have been identified as technologies of neo-liberal government. With this theoretical background, I then provide an overview of substantive work in the area of pregnancy and exercise, identifying gaps in the literature as well as the contributions that my project will make on a theoretical and methodological level.

Theoretical Literature

Theoretical Perspectives of Medicine and Society

In her book *Medicine as Culture,* Lupton (2003) identifies three dominant theoretical perspectives in the history of medical sociology[1]: functionalism,[2] the political economic approach and a social constructionist approach (p. 6). She notes that while variants of all three approaches are in evidence in medical sociology scholarship - and, indeed, that the divisions she draws between the perspectives have blurred in recent years - the social constructionist approach has gained ascendancy over the past two decades in line with the poststructuralist turn more generally.[3] While I incorporate some of the concerns of the political economy perspective into my research, it is the social constructionist approach that I privilege. Thus, I will first offer a brief overview of the political economy perspective (along with a few critiques and limitations) before discussing the central tenets of the social constructionist approach.

The political economy perspective of medicine is rooted in the view that the economy is the basis of society and follows a Marxist critique of the social inequalities produced by the capitalist economic system. From this perspective, notes Lupton (2003):

> the institution of medicine exists to attempt to ensure that the population remains healthy enough to contribute to the economic system as workers and consumers, but is unwilling to devote resources for those who do not respond to treatment and are unable to return to the labour market. Medicine thus serves to perpetuate social

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[1] Medical sociology is also termed the 'sociology of health and illness.' The former is the commonly used term in the United States while the latter is the preferred term in Britain and Australia (Lupton, 2003, p. 6).
[2] The maintenance of social order is the basis of functionalist theorizing on the nature of illness and the medical encounter, with medicine perceived to be an important mechanism to control the potentially disruptive nature of illness. Talcott Parson's explanation of the demands and functions of the 'sick role' and its implications for the physician-patient relationship were particularly influential to medical sociology in the 1950s and 1960s (Lupton, 2003, Turner, 1999).
[3] While Lupton suggests that the sociological tradition of social constructionism is typically privileged in the study of medicine, she also recognizes the importance of the perspectives of anthropology, cultural studies and history. She also notes that the divisions that she draws between perspectives and paradigms have become blurred in recent years, but that she maintains these divisions for the sake of clarity.

> inequalities, the divide between the privileged and the underprivileged, rather than ameloriate them. (p. 9)

Similar to the functionalist view of medicine, political economists see medicine as a moral exercise used to define 'normality' and maintain social order; however, political economists tend to take a negative view of this power dynamic and feel the medical profession is abusing its power.

Proponents of the political economy perspective in the realm of medicine also tend to take up what Lupton (1997) calls the 'orthodox medicalization critique' which asserts that medicine, as practiced in Western societies, has increasingly amassed power and influence over the twentieth century - despite its alleged lack of efficiency in treating a range of conditions and its negative side-effects – so that social life and social problems have become increasingly 'medicalized' (see Ehrenreich & English, 1978; Illich, 1975; Zola, 1972). In this view, individuals are rational independent human subjects whose autonomy is being constrained by the more powerful medical profession that medicalizes everyday life and in doing so dictates how others should behave. The increasing power of scientific medicine, it is argued, results in the further marginalization of disempowered groups by reframing issues of social inequality as medical issues that are better treated by drugs/medical therapies rather than by making wider structural changes to society. The medicalization critique has been taken up by feminists who view the medical profession as a patriarchal institution that uses medical discourse to maintain the inequality of women by drawing attention to the weakness inherent to the female body and that fails to recognize realities of women's lives (structural inequalities perpetuated by class, race and gender divisions), instead 'blaming women' for not changing their individual behaviours. Thus, feminists recognize the capitalist system as a key component underlying class

inequality in the realm of medicine but view patriarchy as a pernicious ideology that maintains gender inequality (see Ehrenreich & English, 1978; Oakley, 1984; 1989).[4]

The political economy perspective is important for it draws attention to the social structural reasons underlying health disparities across populations, with the goal of challenging these disparities. As Lupton (2003) notes "continuing problems of access to health care and the larger environmental and political issues surrounding the question of why certain social groups are more prone to ill health remain important points of discussion for the political economy approach" (p. 11). However, there are several critiques of the political economy perspective, a central one being its overly simplistic view of power as something that is possessed by a group or institution, wielded from above by those in possession of economic power.[5] Moreover, while proponents of the political economy perspective (and medicalization critique) question the value of biomedicine and highlight it as an institution of social control that reinforces racism, patriarchy and social class inequalities, it tends to accept the neutrality and objective validity of medical knowledge itself. In short, the production (or philosophy) of knowledge is not problematized – which stands in contrast to a social constructionist approach.

Plainly stated, social constructionists question the existence of essential truths, instead viewing what is asserted to be 'truth' as a product of power relations, never neutral but always in the interest of an individual or social group (Burr, 2003).

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[4] Health promotion scholars have taken up the political economy perspective, arguing that health promotion efforts often fail to address the consequences of capitalism on public health, consequences such as social inequalities, poverty and pollution to name a few (see Crawford, 1977; Nettleton & Bunton, 1995).

[5] As I will discuss in more detail below, scholars taking a social constructionist approach generally have a different view of power, recognizing a multiplicity of interests and sites of power. As Lupton notes (2003), the view that "medicine acts as an important institution of social control has remained but the emphasis has moved from examining medical power as an oppressive, highly visible, sovereign-based power, to a conceptualization of medicine as producing knowledges which change in time and space" (p. 13).

Knowledge is not independent of reality but produced through human interactions and social relations and therefore subject to change. In this view, knowledge is not a linear progression, producing increasingly refined knowledge, but is "a series of relative constructions which are dependent upon the socio-historical setting in which they occur and are constantly renegotiated" (Lupton, 2003, p. 12).

Early proponents of this viewpoint were Berger and Luckmann (1967) who questioned the notion that the 'truth' about the world (or social phenomenon) can be revealed by identifying and analyzing the hidden structures shaping reality, instead asserting that human beings create and then sustain all social life through social practices. According to Burr (2003, p.13), the anti-essentialist account of social life offered by Berger and Luckmann shows "how the world can be socially constructed by the social practices of people but at the same time experienced by them as if the nature of the world is pre-given and fixed" (p. 13). The social constructionist approach has gained popularity in the last few decades with the growing popularity of poststructuralist theory which questions the humanist notion of a conscious, unified and rational subject and views reality as 'constructed' through language and cultural practices (Burr, 2003; Rail, 2002; Weedon, 1997).[6] As Lupton (2003) explains, post-structuralism brings to social constructionism a consideration of power relations at the macro-level, thus incorporating some of the concerns of the political economy perspective – previously neglected in the more 'micro' symbolic interactionist analyses (p. 12).

[6] From a poststructuralist perspective, human identity (or subjectivity) is not an innate feature of an individual, but socially produced and therefore shifting and open to change (Burr, 2003). Moreover, proponents of this perspective reject the (structuralist) notion that the 'truth' about the world (or social phenomenon) can be revealed by identifying and analyzing the hidden structures shaping reality such as the economy. Marx, for example, explained the social world in terms of an underlying economic structure, his theory constituting a meta-narrative in that it understands the social world in terms of one all-embracing principle – class relations (see Burr, 2003, p. 11). Post-structuralism emphasizes the co-existence of "a multiplicity and variety of situation-dependent ways of life" (p. 12), or pluralism.

Recognizing medical knowledge as inextricably linked with culture and social practices allows for alternative ways of thinking about the 'truth' claims of biomedicine and health promotion. It illustrates, notes Haraway (2004), that the commonsense ideas that we currently hold are often not objective 'facts,' but socially constructed. Scholars following this tradition have undertaken 'science studies,' demonstrating that science is not purely objective, but rather driven by the politics of culture (see for instance Fleck, 1979; Latour, 1987; Latour & Woolgar, 1986; Price & Shildrick, 1999; Pronger, 2002; Vertinsky, 1994). Fleck (1979, originally published 1935) offered one of the earliest examinations of the socially constructed nature of scientific 'facts,' arguing that every scientific concept and theory is culturally conditioned and the product of 'thought collectives' – a certain way of viewing or thinking about a concept or issue at a certain point in history. An examination of the construction of a scientific 'fact' entails tracing an issue back to its roots (i.e., before it was accepted as fact or knowledge) in order to get a sense of how certain ideas take on the status of 'truth' (Latour, 1987). In doing so, one may see the political and social nature of the decisions made in studies that (on the surface) often appear 'neutral' and 'objective.' As Latour (1987) explains, one must examine 'science in action' in order to trouble 'ready made science.'

Feminist scholars have led the way in deconstructing medical and scientific knowledge, and in particular have critiqued the 'biology as destiny' ideology taken up in the medical context and used to deny women participation in the public sphere (see for instance, Schiebinger, 1987; Vertinsky, 1994). Indeed, while earlier feminist work tended to understand the body as a 'given' and accepted male categories and claims about the body, feminists taking a social constructionist approach re-conceptualize the ways they

think about the female body by deconstructing 'truths' and producing alternative forms of knowledge that challenge truth claims of biomedicine and science (Price & Shildrick, 1999).[7] In a similar manner, I aim to trace back medical discourse around exercise and pregnancy in the hope of gaining a better understanding of the taken-for-granted features of the present and the workings of power.

A central critique of a social constructivist approach is that it lapses into relativism - that is, if there are no ultimate 'truths' then all perspectives are equally valid, robbing the perspective of any political edge (Burr, 2003; Lupton, 2003). However, following feminist scholars who use this approach, I argue that it allows the researcher to present a different version of the way things *could* be and this deconstruction itself is a political stance. As Lupton asserts: "social constructionism is not nihilistic if it is recognized that exposing the social bases of medicine, health and illness states renders these phenomena amenable to change, negotiation and resistance" (p. 14).[8]

Foucault: Discourse, Power and Knowledge

An influential figure in the rise in prominence of the social constructionist approach within the study of medicine has been Michel Foucault. His historical analyses of how networks of power produce medical knowledge and experience, along with his complex and nuanced understanding of the relationship between power, discourse and the body changed the way that scholars approach the study of medicine (Lupton, 2003).

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[7] See also Lock & Kaufert (1998) for a compilation of feminist essays which are concerned with taken-for-granted knowledge as it manifests itself in the practices of medicine and public health.

[8] Social constructionists have also been critiqued for ignoring the material reality of embodiment in favour of a focus on the discursive construction of health and disease (see Howson, 2005; Williams & Bedelow, 1998). In response to this critique, Lupton argues that "very rarely is it claimed by those adopting the constructionist perspective that fleshly experiences are simply 'social constructs' without a reality based in physical experience. Most social constructionists acknowledge that experiences such as illness, disease and pain exist as biological realities, but also emphasize that such experiences are always inevitably given meaning and therefore understood and experienced through cultural and social processes" (p. 14).

Foucault's primary research objective was to understand the different ways in our culture that humans develop knowledge about themselves, and how this knowledge has shaped the way that individuals make sense of and act in the world (i.e., the effects of knowledge) (Foucault, 2003d; Markula & Pringle, 2006, p. 24). He conducted a range of historical studies of the development of the human sciences (psychiatry and medicine) as well as the prison system and sexuality, focusing on the "rules of formation" around "what is to be done" and "what is to be known" in social institutions, and the effect of these discourses (or regimes of practice) on individual bodies and the social body (population) (Foucault, 2003c, p. 248). In other words, he was interested in the material conditions and social structures that produce certain forms of knowledge, and how these knowledges or discourses in turn shaped social practices.[9]

Discourse is central to the work of Foucault. In his early investigations of the human sciences (his archaeological studies) he was concerned with the discursive rules and structures that produced scientific knowledge. More to the point, he aimed to reveal the set of rules that allow for a discourse to construct its field in particular ways and not others (Locke, 2004). In his book, *Archaeology of Knowledge* (2002, original English translation 1972), he expanded on his concept of discourse, explaining that he tended to use it in three different ways[10]: as a general domain of all statements, an individualizable group of statements and as a regulated practice that accounts for a number of statements. Because of the centrality of 'discourse' to Foucault's project – and my own – I briefly

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[9] He was concerned with 'deconstructing' the discourses or texts that construct our experiences, taking them apart to show how they "work to present us with a particular vision of the world, and thus enabling us to challenge it" (Burr, 2003, p. 18).

[10] As Mills (2004, p. 55) explains, there is an important distinction to be made in Foucault's work between discourse as a whole, which is the set of rules and procedures for the production of particular discourses, and discourses or groups of statements themselves. His archaeological technique was a method for 'unpicking' these rules of formation.

discuss the three uses of discourse to which he refers – although they can be (and typically are) subsumed under a more general definition: a system of thoughts composed of ideas, courses of action, beliefs and practices that shape the way individuals understand and act in the world.

In the first definition (the broadest of the three), discourse is concerned with the statements that join together within specific social contexts and that have a particular meaning and in turn an effect in the 'real' world (Markula & Pringle, 2006, p. 29; Mills, 2004, p. 6). The discursive effect refers to the production of objects, subjects or conceptual understandings. For example, the discursive effect could produce our conceptual understanding of 'motherhood,' the nuclear family (with mother, father and two children), as well as a set of rules for how a mother should act (both unofficial rules disseminated in popular magazines and official rules in the form of laws and policies).[11] Discursive meanings and effects are not 'set in stone' and are viewed as transitory and always open to change.

The second instance - discourse as an individualizable group of statements - refers to statements that apply to the same phenomenon (for example, a discourse of motherhood). They seem to be regulated in some way and to have a common force to them (Mills, 2004). Markula and Pringle (2006) remind us that while some discourses appear to refer to the same phenomenon they should not be viewed as necessarily unified. A discourse of motherhood, for instance, can be related to sets of statements concerned

[11] Foucault stressed that the complex workings of discourse shaped the construction of subjects. In his view, the discourse of motherhood would not automatically shape a woman as a mother but rather she would be subject to multiple (shifting) discourses shaping her identity. Foucault's notion of discourse attempted to decentre the individual as a rational, conscious entity (that acts in the world), instead presenting the formation of individuals (and human identity) as a changing fragmented process (acted upon by the world).

with mothers but can construct mothering in differing/divergent ways. For instance, in some popular advertisements mothers are constructed as harried women racing after their kids and in others as sexy women (i.e., the yummy mummy). Motherhood is not merely spoken into existence but is constructed through various social practices and social policies. As such, discourse should not be considered as "a simple translation between reality and language but as *practices* that shape perceptions of reality" (Markula & Pringle, 2006, p. 31).

In the third usage of discourse – a regulated practice that accounts for a certain number of statements - Foucault was referring to the unwritten rules that guide social practices and shape the way we make sense of the world (e.g., what statements are accepted as truth and what statements are dismissed as unimportant or false). Mills (2004) explains that in this third usage "he is interested less in the actual utterances/texts that are produced than in the rules and structures which produce particular utterances and texts" (p. 6). In my examination, for instance, I illustrate how viewing exercise and pregnancy through a lens of 'objective' or positivist science has led to the creation of certain types of exercise prescriptions, excluding other ways of knowing.

While Foucault's early focus on discursive structures and knowledge production has been termed 'structuralist' in nature (see Dumas & Turner, 2006), he is often associated with the poststructuralist movement, largely due to his rejection of the humanist or Enlightenment view of the subject as a rational individual whose consciousness is unique, coherent and unchanging (Burr, 2003).[12] Instead, he viewed human identity as unfixed and malleable, and shaped by discourse. As he explained:

[12] Foucault disliked being labeled and resisted being positioned in either 'camp' (see Markula & Pringle, 2006; Olssen, 2003).

"nothing has any meaning outside of discourse" (Foucault, 1972 cited in Hall, 2001, p. 73) which is not to say that objects or a 'real world' do not exist, but that discourse is what gives them meaning.[13] Markula and Pringle (2006) explain that while Foucault was critical of the way that humanism placed the individual at the centre of research focus and positioned the individual as "free, rational, unitary and fully coherent" his main concern was the way that humanism "had not necessarily acted to free or liberate humans, but had served as a conceptual tool of domination that resulted in more constrained modes of human behaviour" (p. 28). Foucault also argued that the knowledge generated in different epistemes (the set of discursive structures as a whole within which a culture formulates its ideas, allowing certain ideas to be accepted as 'true' while obscuring others – see Mills, 2004), was not necessarily superior or inferior to previous knowledge but rather was the effect of the discursive conditions in which they were produced. This allowed him, explain Markula and Pringle (2006), to question the modernist notion that scientific knowledge "accumulates in a unilinear fashion and contributes to human advancement" (p. 27).[14] Tied to this, he also questioned the positivist assertion that knowledge is objective in nature – and indeed, a central aim of his work was to trouble the 'truth claims' of science. Rail explains that his assertion that "knowledge was always subject to certain epistemic conditions and that truth, accordingly, was always a partial, localized version of reality" (2002, pp. 183-4) is in line with the postmodernist viewpoint.

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[13] For example, in *History of Sexuality, Volume 1* (1990), he discusses how discourse around sexuality constructed individual's understandings of it, and in fact, actually produced individuals as sexual subjects. According to Foucault, sexuality is not an innate quality of the body, but socially constructed – the effect of power.

[14] Markula and Pringle (2006) further note that his focus on ruptures in the episteme allowed him to decentre the subject and deemphasize the role of human consciousness (p. 28).

The concepts of 'knowledge' and 'power' are also central to the work of Foucault, and closely link to his ideas around discourse in what Carabine (2001) calls the discourse/power/knowledge triad. While there can be competing or contradictory knowledges within a discursive field, those knowledges accepted as the 'truth,' 'natural' or 'just the way it is' are imbricated with relations of power as they can then be put to practice in the regulation of social conduct and, more specifically, the regulation of bodies (Hall, 2001). According to Hall (2001), the application and effectiveness of this power/knowledge concept was, in Foucault's opinion, more important than whether or not the knowledge was actually 'true.' He further explains, "knowledge linked to power, not only assumes the authority of 'the truth' but has the power to *make itself true*. All knowledge, once applied to the real world, has real effects and in that sense, at least, 'becomes true'" (p. 76).

With this emphasis on the importance of discourse and the close relationship between truth and knowledge, Foucault introduced a new concept of power. His model is not a top-down one in which power is possessed by a dominant group and used to oppress another group, but instead, power is seen as dispersed throughout society in a network of power relations. The power relations running throughout society *produce* forms of subjectivity and behaviour rather than just repressing them and in effect, constitute the subject (Mills, 2004, p. 18). Bodies are invested with power in the form of 'knowledges' (medical advice to pregnant women, for instance), producing certain forms of behaviour and limiting others.[15] This is not to say that Foucault did not recognize the importance of the state in regulating society and/or the possibility of power asymmetries and even

[15] Stated in a slightly different manner, power is productive because it is people's daily and ongoing relationships with each other that ultimately produce subjectivities (Markula & Pringle, 2006).

domination (for example, in the prison system).[16] At the same time, however, he did not wish to reduce power to the state, economy or large institutions in a determinate cause and effect relationship, for he viewed these structures as ultimately rooted in the micro-practices of everyday life. Indeed, he suggested that the state (with its prohibitions) can only "take hold and secure its footing where it is rooted in a whole series of multiple and indefinite power relations" that invest "the body, sexuality, the family, kinship, knowledge, technology" (Foucault, 2003g, p. 309).[17]

'Resistance' is central to Foucault's concept of power. He viewed power and resistance as mutually constitutive, as evidenced in his oft-cited assertion that: "where there is power, there is resistance, and yet, or rather consequently, this resistance is never in a position of exteriority in relation to power" (1990, p. 95). In his view, the relational nature of power as a dense web passing through various institutions and apparatus in society *depends* on multiple points of resistance to reinforce it, to "play the role of adversary, target, support, or handle in power relations" (p. 95).[18] According to Foucault, these points of resistance are present everywhere in the power network, and as a result there "is no single locus of great Refusal, no soul of revolt, source of all rebellions, or pure law of the revolutionary. Instead there is a plurality of resistances, each of them a special case" (p. 95-6). Thus, one cannot account for resistance through a grand theory

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[16] Foucault discusses 'states of domination' in more detail in his essay entitled *The Ethics of the Concern of the Self* (2003e).

[17] His ideas around the possibility for complete liberation underscore this point. Foucault asserts that even if a state of domination is reversed, this does not mean an individual or group is completely liberated and free of relations of power.

[18] He views power as produced through relations between individuals and groups of individuals as they implement tactics and strategies to carry out their various objectives, objectives which are sometimes complementary, sometimes contradictory. These tactics become connected to one another, "attracting and propagating one another, but finding their base of support and their condition elsewhere, end by forming comprehensive systems" with clear aims - yet "it is often the case that no one is there to have invented them, and few who can be said to have formulated them" (Foucault, 1990, p. 95).

but instead must examine the strategic field of power relations surrounding the issue of interest, recognizing that power relations change and shift before one's eyes:

> the points, knots, or focuses of resistance are spread over time and space at varying densities, at times mobilizing groups or individuals in a definitive way, inflaming certain points of the body, certain moments in life, certain types of behaviour. (p. 96)

Similar to the manner in which the network of power relations are not rooted in one location but weave throughout society, "so too the swarm of points of resistance traverses social stratifications and individual unities" (p. 96). Revolution is possible but through the "strategic codification of these points of resistance" - somewhat similar to the way in which the state relies on the institutional integration of power relationships (ibid.).

Feminism and Foucault

Feminists disagree about the usefulness of Foucault's work for feminist theory and practice. In her book, *Feminism, Foucault and Embodied Subjectivity*, McLaren (2002) explains that "some feminists advocate a Foucauldian feminism while others argue that the underlying assumptions of feminism are antithetical to Foucault's theoretical framework" (p. 1). McLaren points to three major points of tension for feminist scholars who reject Foucault, the first being his own rejection of a normative framework which underpins such concepts as 'justice,' 'equality' and 'freedom.' This rejection, when combined with the view that truth and knowledge are never free of power relations, has led some feminists to claim that his work slips into relativism and nihilism, undermining the emancipatory (political) aim of feminism. The second sticking point is his view of subjectivity as produced solely within and in relation to discourse which has been critiqued for negating agency and/or resistance by women (see also McNay, 1991). Finally, it has been asserted that his concept of 'power as everywhere' leaves no way to

distinguish the difference in power between the dominated and the dominator. This is viewed as particularly problematic, notes McLaren as, "a conception of power that can account for the asymmetry of gendered power relations is essential for feminism" (p. 2.)

Despite these critiques, other feminists find Foucault's ideas about the body and power relations to be particularly useful. McLaren (2002) explains that, ironically, it is the very ideas that some feminists find problematic that others – notably poststructuralist feminists – embrace.[19] She further observes that:

> some feminist supporters of Foucault see his anti-humanism, his rejection of metanarratives and universal norms, and his challenge to the notion of a unified subjectivity as necessary steps toward a politics of diversity and inclusion. And many feminists find Foucault's conception of power as a network, and as operating through discourses, institutions and practices beneficial for understanding the ways that power operates locally, on the body, and through particular practices. (p. 2)

Indeed, Weedon (1999) notes that his approach enables feminists to recognize both the repressive and productive aspects of power relations, including those which are patriarchal but "none the less offer women forms of subjectivity that are experienced as pleasurable" (p. 119). Bordo (1993b), for instance, draws on Foucault's relational concept of power to better understand eating disorders as encouraging practices that train the body to comply with cultural norms, while at the same time being experienced in terms of power and control. More specific to my focus on pregnancy is the work of Sawicki (1991), recognized as one of the first Foucauldian feminist accounts of obstetrics and new reproductive technologies (NRT). In *Disciplining Mothers*, Sawicki questions the radical feminist view that obstetrical practices and NRTs are modern technologies that work as a form of social control and domination over the female body and reproductive capacities (akin to Marcuse's notion of 'technological rationality') - in essence, a form of violence

[19] The 'Foucault debate' is symbolic of the debate about the compatibility of a poststructuralist approach with emancipatory politics, more generally.

against the female body. She offers a Foucauldian account of the history of women's procreative bodies, a history that recognizes "multiple centres of power, multiple innovations, with no discrete or unified origin" (p. 80). Her book is an excellent early example of the application of Foucauldian theory to the history of female reproduction. She presents a nuanced account of how power works through the techniques of surveillance and the creation of 'norms,' and how women may experience NRTs as enabling (instead of repressive) in that they offer possible solutions to the problems women face. Her work also serves as a useful reminder that:

> a Foucauldian feminist does not assume a priori that the new reproductive technologies are the product of a long standing male 'desire' to control women's bodies or to usurp procreation. This does not mean that such motives do not play a role in this history of medicalization, but it does deny that they direct the historical process overall. (p. 80)

In recent years, a growing number of feminist scholars have recognized the usefulness of a Foucauldian perspective in the examination of the various political, social and cultural aspects of pregnancy (for instance, Lee & Jackson, 2002; Wetterberg, 2004; Weir, 1996; 2006). I share this position and add to this growing body of literature with my own project. I will now turn to a more detailed discussion of Foucault's notion of the body and power, discussing how feminists have taken up his ideas and how I plan to make use of them in my own research.

The Body and Power

It was in his genealogies of the prison system (*Discipline and Punish*) and sexuality (*History of Sexuality, Volume 1*) that Foucault more fully fleshed out his ideas around the working of power by examining ruptures in the episteme (or ways of thinking) in the shift from traditional to modern society. Through his genealogical work he

explored the body as a site of the operation and exercise of power and one of his main concerns was the way that social norms operate on the body (something shared by feminists who problematize the working of norms – especially patriarchal norms on the female body). The working of disciplinary power was the focus of *Discipline and Punish* (1977) which sketched the practice of imprisonment, illustrating how beginning in the seventeenth century there was a decrease in violent public punishment. By the nineteenth century, it had almost disappeared in favour of a much more subtle form of power which operated largely by investing the body and mind with knowledge within the enclosed space of the prison. In an attempt to produce a disciplined, "docile" body the prisoner was subjected to "habits, rules, orders, and authority...exercised continually around him and upon him, and which he must allow to function automatically in him" (p. 128-129). Foucault suggested that the success of disciplinary power derives from the use of the instruments of surveillance (both by others and by instilling individuals with the habit of self-surveillance) and normalizing judgments which impose homogeneity at the same time that they individualize (or make it possible to compare oneself to others) (p. 192).[20]

For Foucault (1977), the architectural structure of Jeremy Bentham's panopticon encapsulated the workings of disciplinary power in that it maximized the efficient workings of power. It consisted of a guard tower at its center that looked out at a surrounding building divided into separate cells. Each cell had a window into which the prison guard could gaze – but without the inmate knowing if he/she were being observed. The primary effect of the panopticon (and the omnipresent gaze) was to discipline the

[20] He further explained that the collection of personal knowledge about the subject is also required for the production of disciplined bodies; personal knowledge is collected through the use of three instruments: hierarchical observation (i.e., surveillance), normalizing judgment and their combination in a procedure that is specific to it, the examination. These three techniques help to transform individuals into 'objects of knowledge' (Pringle & Markula, 2006, p. 41).

inmates to survey and monitor their own behaviours. According to Foucault (1977), panopticism also worked on a broader societal scale as the mechanisms of surveillance and discipline expanded (throughout the eighteenth and nineteenth century) into such institutions as schools, factories and hospitals. Indeed, these disciplinary techniques were conducive to "controlling the location of individuals and the production of work – via manipulation of space or architecture, the organization of time (e.g., rigid timetables) and the use of graduated, repetitive and systematized 'exercises' – to help produce docile but productive bodies" (Markula & Pringle, 2006, p. 41).

In this view, power 'works from below,' regulating society not through physical restraint and coercion, but through individual surveillance and self-correction to norms, and the body is the ultimate site of this regulation (Bordo, 1993b). Thus, although disciplinary power was regarded by Foucault as a 'technology of dominance,' it can be characterized as a more positive or productive form of power (versus sovereign/juridical power which is more negative or coercive).[21] To provide a contemporary example of the working of disciplinary power, feminist researchers in the area of sport sociology have drawn upon Foucault's notion of disciplinary power to examine how women's fitness magazines (with their glossy photos of toned bodies and 'success stories') expose women to a panoptic gaze that encourages them to self-regulate and monitor their bodies to attain feminine bodily norms (Duncan, 1994; Markula, 1995). Similarly, it may also be applied to a woman's experience of pregnancy in contemporary Western society. Since the rise of the prenatal movement in the 1920s, for instance, there has been a proliferation of educational material for pregnant women, advising that they engage in a number of

[21] Foucault's ideas on the workings of panoptic power rest on the assumption that individuals are free – and this relative freedom related to the efficiency of the panopticon as individuals could assume some of the burden of regulatory function formerly taken on by the state (see Markula & Pringle, 2006, p. 44).

'normalizing practices' (follow proper nutrition and exercise guidelines, undergo routine medical examinations) thus encouraging women to monitor and regulate their bodies. Such disciplinary practices may be simultaneously constraining and empowering as women struggle (physically and emotionally) to achieve certain norms yet feel satisfied/empowered when/if they are able to do so.

In the *History of Sexuality, Volume I* (1990, French original 1976), Foucault further elaborated on the workings of power, introducing the notion of 'biopower,' a form of power that circulates throughout society, regulating both individual bodies and the collective social body. He suggests that the demographic upswing in the eighteenth century created the problem of 'population' and more specifically, the need to control the population. Biopolitical techniques such as demographics and the calculation of available resources for citizens emerged to aid in the administration of the collective social body. Knowledge about the population was produced through the use of the techniques of statistics, demography and epidemiology and by experts in such fields as psychiatry, medicine and criminology. Thus, "power over life," Foucault contends, developed around two opposite yet complementary poles: the disciplined, individual body (inscribed with social norms) and the species body (population control, public health and genetics) (p. 139). In short, "there was an explosion of numerous and diverse techniques for achieving the subjugation of bodies and the control of populations, marking the beginning of an era of 'biopower'" (p. 140). Significantly, Foucault observed that biopolitical mechanisms (which apply to the population) and disciplinary mechanisms (which apply to the individual body) connect through the norm, acting together to constitute power over life (bios) or biopower (Foucault, 2003; Harwood, 2009).

Foucault identified women's reproductive health as a key dimension of the history of biopower, asserting that in the nineteenth century a "thorough medicalization" of the female body and their sex "was carried out in the name of the responsibility they owed to the health of their children, the solidity of the family institution, and the safeguarding of society" (Foucault, 1990, pp. 146-147). Although never completed, Foucault had intended to "locate the processes through which women's bodies were controlled through a set of discourses and practices governing both the individual body and the health, education and welfare of the population, namely, the discourses and practices of 'biopower'" (Sawicki, 1991, p. 67). Building upon Foucault's notion of women's health as a form of biopower, Sawicki (1991) observes that:

> [i]f, as Foucault claimed, biopower was an indispensible element in the development of capitalism insofar as it made possible a 'controlled insertion of bodies into the machinery of production,' then it must also have been indispensable to patriarchal power insofar as it provided instruments for the insertion of women's bodies into the machinery of reproduction. (p. 68)

As the quote by Sawicki suggests, feminists have usefully taken up the notion of women's health as a form of biopower in their examinations of the way that the individual female body has been disciplined through the use of medical knowledge, monitoring, practices of surveillance and technological advances (e.g., NRTs) which construct 'norms' to which women must conform, with the corollary aim of maximizing the health of the population (see Jette, 2006; Sawicki, 1991; Weir, 2006).

Foucault's ideas regarding the working of power are especially relevant to my research, for the pregnant body is, essentially, the perfect site for the administration of biopower. The disciplining of the individual pregnant body results in the simultaneous regulation or management of the social body. Thus, discourses (or 'truth claims') that

work to construct 'norms' regarding the actions that pregnant women must undertake to have a healthy baby encapsulate the workings of biopower. Such teachings or directions on how to live, how to eat, how to move, how to look have been termed *bio-pedagogies*, part of the apparatus of governmentality that focuses upon regulating life (Harwood, 2009; Rail & Dumas, 2008; Wright, Rail, MacDonald, MacNeill & Evans, 2006).[22] As I will discuss in more detail in the methodology section, in my dissertation I focus on three sites of communication and knowledge exchange, with the aim of interrogating the concealed pedagogical practices of biopower as they relate to exercise during pregnancy.[23]

Governmentality

Biopower, as one form of power (a technology of domination), is part of a larger complex of power relations that Foucault later termed 'governmentality,' "an ensemble formed by institutions, procedures, analyses, and reflections, the calculations and tactics" (2003a, p. 244) that aims to regulate the population not through coercive means but by providing guidance on how individuals should conduct themselves. He therefore used the concept of government to help explicate the close link between power relations and the process by which individuals are made into subjects (subjectification) (Lemke, 2001). In his famous essay entitled *Governmentality* (Foucault, 2003a), Foucault described how, from the mid-sixteenth to the end of the eighteenth century, there was a shift in political writings from treatises presented as 'advice to the prince' about how best to secure the

[22] Harwood (2009) suggests that a consideration of the workings of truth, power and modes of subjectification "take shape as analytic tools for interrogating biopower's pedagogies of life" (p. 19).
[23] Before moving on, however, I should note that while I take up Foucault's notion that power is relational (i.e., power is everywhere in the micro-practices of everyday life), I recognize that power asymmetries do exist in the form of the capitalist system (economy) and patriarchy, for example. As Bordo (1993a) so succinctly states, "no one may control the rules of the game, but not all players on the field are equal" (p. 191). Thus, as researchers we must attend to specific, local contexts and situations, but also move beyond the local, individual level to analyze power relations at the level of large scale social structures.

acceptance and respect of his subjects to a concern with the 'art of governance' or "how to be ruled, how strictly, by whom, to what end, by what methods, and so on" (p. 229).[24] He defined government as 'the conduct of conduct,' a term which ranges from 'governing the self' to 'governing others.' As Lemke (2001) explains, "All in all, in his history of governmentality, Foucault endeavours to show how the modern sovereign state and the modern autonomous individual co-determine each other's emergence" (p. 191).

In his *Governmentality* essay, Foucault (2003a) identified a shift in the mentality of government in seventeenth century Europe towards the view that the population, the market and individuals (three of the main entities to be 'discovered' during this time) were actually self-governing, with their own intrinsic mechanisms of self regulation (O'Malley, 2008, p. 55; Rose, 1993, p. 289). The central aim of government became to foster these self-organizing capacities without disrupting their natural rhythm or internal logic. This produced a series of problems about *how* to govern individuals, families and the market without destroying their existence and autonomy – or in other words how to strike a balance between governing too much and too little.

Thus, the emerging political rationality of the time (liberalism) sought to limit the scope of political authority in favour of emphasizing individual freedom, and led to the formation of a whole series of governmental apparatuses and the development of a whole complex of knowledges in order to 'know' and govern the population (Foucault, 2003a, p. 244). Experts and the knowledge they produced, especially in relation to the modern

[24] In his genealogy of the art of governance, Foucault traced "the concern with government from its initial usage in relation to the management of the family, to its concern with territory, to its concern with the category of population, to its concern with civic society" (Olssen, 2003, p. 197). Foucault suggests that while the notion and theory of the art of governance were put forth in the sixteenth and seventeenth century, they were implemented to a limited extent due to military, political and economic tensions that 'afflicted' the seventeenth century from beginning to end. He also suggests that the centrality of sovereignty as the primary political institution (in the seventeenth century) impeded the implantation of the art of governance.

professions (such as medicine, public health, psychiatry and criminology) were central to governmentality – allowing the state to 'govern at a distance' (Lupton, 1995; Rose, 1993) as individuals were 'produced' through the knowledge that was created, governing themselves. By linking itself with the authority of expertise, liberal governance was not arbitrary but based upon knowledge and intelligence concerning those whose well-being it was mandated to enhance (Rose, 1993, p. 290). As Rose and Miller (1992) argue:

> government is intrinsically linked to the activities of expertise, whose role is not one of weaving an all-pervasive web of 'social control', but of enacting assorted attempts at the calculated administration of diverse aspects of conduct through countless, often competing, local tactics of education, persuasion, inducement, management, incitement, motivation and encouragement. (p. 175)

Thus, while the State was important as part of the structure of power relations, so too were the numerous institutions, sites, social groups and interconnections at the local level, whose concerns and activities could support, as well as conflict with, the imperatives of the state (Lupton, 1995, p. 9).

It is important to note that in Foucault's view, sovereign and disciplinary power did not disappear but a governmental order became pre-eminent – a more tactical approach was taken in which risk was to become a central technology (as I address in more detail below). His intent was to dispense with forms of epochal analysis, as evidenced by his suggestion that:

> we need to see things not in terms of the replacement of a society of sovereignty by a disciplinary society and the subsequent replacement of a disciplinary society by a society of government; in reality one has a triangle, sovereignty-discipline-government, which has as its primary target the population and as its essential mechanism the apparatuses of security. (2003a, p. 243)[25]

[25] Notably, he viewed 'governmentality' as capturing the encounter between the technologies of domination of others and technologies of the self, as he expressed a few years after writing his original *Governmentality* essay (Foucault, 2003d, p. 147). Foucault also differentiated between positive (or productive) forms of power such as disciplinary power and security/governance and negative forms such as sovereign power.

With his writings about Governmentality, Foucault extended his discussion about the influence of the State over populations to focus more on the links between *micro-* and *macro-workings* of power (Foucault, 2003). As Markula and Pringle (2006, p. 20) explain, he illustrated how his earlier theorizations concerning the working of power at *local* levels could be similarly used to understand the *broader* workings of power associated with State governments. His concept of Governmentality, however, was not intended to serve as a grand or systematic theory of power, but instead "stress was to be placed on the multiplicity of power relations, and the diversity of their origins, workings, and effects" (O'Malley, 2008, p. 53). He introduced the concept as he saw existing theories of power during that time - which set up a dichotomy between public/private, state/civil society, political/non-political and viewed power as emanating from a single, central source - as unable to comprehend the complex working of power in modern societies.[26]

In this sense, governmentality (small 'g') was intended as an analytical tool to be used to help understand (deconstruct) the workings of power or 'Governmentality' (O'Malley, 2008, p. 54) – although Foucault's colleagues have been credited with further developing the 'governmental analytic' (p. 57). According to Rose and Miller (1992), the problematics of government may be analyzed in terms of their *political rationalities* (the broad discursive frame of reference through which political problems and solutions are identified and considered, and which determine the focus and objects of governance) and in terms of the *technologies of government* (which pertain to the level of

[26] Instead, his notion of biopower and governmentality allowed recognition of "the complex dependencies between the forces and institutions deemed 'political' and instances, sites and apparatuses which shape and manage individual and collective conduct in relation to norms and objectives, but yet are constituted as 'non-political'" (Rose, 1993, p. 286).

operationalization and involves a consideration of the techniques, tools and means through which practical policies are devised and inserted) (see also Olssen, 2003, p. 197; Rose, 1993). It is through an analysis of the intricate inter-dependencies *between* political rationalities and governmental technologies, note Rose and Miller (1992), that we can begin to understand the multiple and delicate networks (or the various technologies) that "connect the lives of individuals, groups and organizations to the aspirations of authorities" (p. 175-6).[27] His analytic of governmentality also had a political aim, namely to provide a tool that would help destablilize and question the present by revealing its contingent formation. As O'Malley (2008) explains:

> In governmentality, emphasis would be on how that which appears as necessary is to be understood as assembled together out of available materials, ideas, practices, and so on, in response to a specific understanding of the nature of problems to be solved...as the arbitrariness of many taken-for-granted categories in the present is made visible, possibilities for change emerge – the analytic gives rise to insights into how things might have been otherwise, and thus how they *could* be different in the future. (p. 54)

Thus, this analytic tool is in line with the poststructuralist feminist goal of deconstructing the present and creating alternative ways of knowing.

Welfarism and Neo-liberalism: Political Rationalities of Governance

Foucault traced the genealogy of Governmentality from the days of Classic Greek and Rome (via Christian pastoral power) through to post-WWII forms of neo-liberalism, but his most well known governmental writings focused on the exercise of power in modern societies characterized by classical liberal values (discussed above). However, his analytical technique of governmentality has been taken up by scholars examining

[27] Or, as Olssen (2003) explains, "it is the conceptual coupling of political rationality with specific technologies of governance which enables one to understand the link between *discursive systems* and *material realities* and, thus, which are essential to conceptualizing liberal and neo-liberal forms of state reason" (p. 197, my emphasis).

power relations in Western society from the nineteenth century to present, with an intense interest in neo-liberal forms of governance (see for instance, Lupton, 1995; Olssen, 2003; O'Malley, 2008; Osbourne, 1993; Rose & Miller, 1992; Rose, 1993). Because I aim to examine power relations with respect to exercise and pregnancy across the twentieth century and into present, these previous analyses, which sketch out the shifts in political reason and technologies of governance over this time (including the changing role of experts and expert knowledge as well as shifts in models of risk management), provide a useful backdrop for my own investigation. In what follows, I provide a brief overview of this literature, drawing largely upon two much-cited genealogies of liberal governance, that of Rose (1992) and Rose and Miller (1993).

Rose and Miller (1992) explain that the welfare state (or welfarism) was programmatically elaborated in relation to a number of specific problems that nineteenth century liberalism was thought to be responsible for and/or failed to address (including low birth rates, social fragmentation and the individualization of modern society as evidenced by high rates of suicide and crime, delinquency and the recognition that ill health had negative social consequences). It was thus structured by the wish to encourage national growth and well-being through the promotion of social responsibility and the sharing of social risk (Rose & Miller, 1992, p. 192). As a political rationality, it subscribed to the key principles of community, rational planning and institutional design. Rose and Miller (1992) note that a key innovation of welfarism lay in its attempt to link the "fiscal, calculative and bureaucratic capacities of the apparatus of state to the government of social life" (p. 192-3). In other words, it sought to better organize the 'tangle' of machinery for the surveillance and regulation of the social, familial and

personal conduct of the problematic sectors of the population (i.e., the courts, reformatories, schools, clinics) that had emerged out of classical liberalism.

The prominence of experts (and expert knowledge) as a technique of governance remained, but an attempt was made to make it more centralized. As Rose (1993) notes, the authority of expertise became inextricably linked to formal political apparatus of rule with the aim of re-establishing solidarity in a social form (p. 285). The goal was to transform the state into a centre that could programme (shape, guide, and control) events and persons distant from it – not directly but *through society* (i.e., form a centre from which welfare apparatus could be governed). This was to be done by acting upon persons and events in relation to a *social* norm and constituting their experiences and evaluations in a *social* form. It is important to note that the state of welfare still sought to keep distance between the knowledges and allegiances of experts and the calculations of politicians. As Rose explains:

> The truth claims of expertise were highly significant here: through the powers of truth, distant events and persons could be governed 'at arms length': political rule would not itself set out the norms of individual conduct, but would install and empower a variety of 'professionals' who would, investing them with authority to act as experts in the devices of social rule. (p. 285)

Social insurance was one technique of government to emerge which exemplified the collectivist desire of welfarism to encourage national growth and well-being through the promotion of social responsibility and the mutuality of social risk (Rose, 1993, p. 293). As a government sponsored insurance programme, it provided protection against socially recognized conditions (i.e., aging, disability, unemployment) and was funded through premiums or taxes paid by or on behalf of participants. Thus, risk was still spread

across the population but through taxation.[28] The other exemplary technique of government to emerge was social work which Rose (1993) describes as both individualizing and responsiblizing. Social work does not act upon communities as a whole but rather on specific problematic cases. With respect to the prenatal movement, for example, nurses identified individual mothers who were not following social norms (i.e., who were judged as pathological in relation to social norms and therefore 'at risk') and then visited their homes with the aim of educating and 'responsibilizing' them.

Rachel Turner (2008) asserts that the rise of neo-liberalism was not a mere revival of classical liberal doctrines (advocating free trade and minimal state intervention) but rather that it originated (in the late 1940s) as a counter-movement to the collectivist threat (i.e., welfarism) that it saw sweeping throughout the Western world. These various formulations of collectivism, comments Turner, "not only formed the context in which neo-liberalism arose, but also provided one if its key distinguishing arguments: that all forms of collectivism, even milder rationalist liberal forms, lead to dictatorship and economic catastrophe" (p. 75). Thus, the political rationality of neo-liberalism was in large part the solution to the political 'problem' of welfarism and since the 1970s, contends Harvey (2005), "there has everywhere been an emphatic turn towards neo-liberalism in political-economic practices and thinking" (p. 2). That is to say, de-regulation, privatization and withdrawal of the state from collective social provisions

[28] Rose explains that social insurance is both inclusive and solidaristic as it "incarnates social solidarity, collectivizing the management of the individual and collective dangers posed by the economic riskiness of a capricious system of wage labour and the corporeal riskiness of a body subject to sickness and injury, under the stewardship of a 'social' state" (p. 293). It therefore established new connections between 'public' norms and procedures and the fate of individuals in their 'private' economic and personal conduct (one of an assortment of ways in which, at the start of the twentieth century, the 'privacy' of the spheres of family and factory were attenuated).

have become the reality of neo-liberal political reason (p. 3).[29] It is proposed that the individual citizen is best served (i.e., best able to exercise his or her freedom and skills) within an institutional framework characterized by private property rights, free trade and free markets (Harvey, 2005, p. 2). Gone is the collectivist desire of welfarism to encourage national growth and well-being through the promotion of social responsibility and the mutuality of social risk.

The notion of the autonomous individual is central to the success of neo-liberalism. Rose (1993) notes - somewhat ironically - that while neo-liberalism arose out of critiques of welfarism and its alleged failing, it was also made possible through a range of new devices for governing the conduct of individuals that have their origins in the 'success' of welfare (p. 285). He contends that welfarism and its associated experts had been successful in implanting the norms of health and education into citizens. The result is the disciplined, rational, autonomous and choosing individual – the calculating entrepreneur that is central to the success of neo-liberalism. As Rose notes, we see the reversibility of the relations of authority – what starts off as a norm to be implanted into citizens can be repossessed as a demand which citizens can make of authorities. In addition to the shift away from governing through *society* towards governing through the regulated choices of *individuals,* Rose explains that neo-liberal rule articulates experts into the apparatus of rule differently. That is, it seeks to "detach the substantive authority of expertise from the apparatuses of political rule, relocating experts within a market

[29] Turner (2008) observes that there is no pure 'neo-liberalism' for it is composed of different strands that make it complex and difficult to define. She suggests, however, that three core principles can be identified: the importance of the market order as an indispensable mechanism for allocating resources and ensuring individual freedom; minimal state intervention (the state is afforded the primary responsibilities of securing law and order, providing public goods and preserving the rules that safeguard the market order, but the centralized political apparatus of welfarism is eschewed); the privileging of private property rights.

governed by the rationalities of competition, accountability and consumer demand" (Rose, 1993, p. 285). With respect to the medical profession, for instance, the calculative regimes of positive knowledge of human conduct were replaced by the calculative regimes of accounting and financial management (Osbourne, 1993). In my work, I illustrate how expert medical knowledge has been taken up (profitably) by entrepreneurs in the health and fitness industry, becoming part of the apparatus in the governance of society (see Jette, 2006, plus Chapter Seven of this document).

A common theme to arise in genealogies of liberal governance, notes O'Malley, 2008, p. 69) has been that of 'risk' and more specifically, changes in the manner in which risk (as a technology of governance) has been constituted and deployed under differing political rationalities of rule, particularly in the change from welfarism to neo-liberalism which witnessed a shift from spreading risk across society (social insurance) to personal responsibility for risk (prudentialism).[30] I discuss this body of literature in more detail in what follows.

Socio-Cultural Theories of Risk

'Risk' has arguably become one of the defining cultural characteristics of Western society (Beck, 1992; Douglas, 1990; Giddens, 1991; Lupton, 1999).[31] Indeed, we live in a society that has become more and more aware of risk, especially those caused by technology and lifestyle habits (Lupton, 1993). On a daily basis one hears about some

[30] Foucauldian scholars view 'risk' as a central technology of governance because it works at the level of the population. That is to say, risk is a statistical and probabilistic technique in which large numbers of events are sorted into a distribution. The distribution can then be used as a way of making probabilistic predictions that can be used to manage the population in an efficient manner (based on how they compare to the normal distribution of the population). Rather than attempting to learn about an individual case in detail (the focus of disciplinary technologies), only certain recurring characteristics (i.e., risk factors) are attended to (O'Malley, 2008).

[31] As Robertson (2001) explains, "risk has become a common construct around which health in western society is described, organized and practiced, both personally and professionally" (p. 293).

sort of risk or another: of global warming due to the depletion of the ozone layer; of cancer due to drinking out of plastic water bottles; of a long term global recession due to inappropriate banking and lending practices; of lung cancer by smoking and by inhaling second and even third-hand smoke. Lupton (1993) emphasizes the prevalence of health risks in the late twentieth century, explaining that they:

> seem to loom around every corner, posing a constant threat to the public. They constantly make headlines in the news media and are increasingly the subject of public communication strategies. Risk assessment and risk communication have become growth industries. In short, the work 'risk' itself has acquired new prominence in western society, becoming a central cultural construct. (p. 425)

To be sure, 'risk' is a central discourse of contemporary pregnancy – it has become a common construct around which pregnancy is described, organized and practiced in both the popular and medical realm (Lee & Jackson, 2002; Lupton, 1999; Ruhl, 1999; Weir, 1996; 2006; Wetterberg, 2004).

Significantly, there are numerous definitions and understandings of 'risk,' depending on who is using the term – making it a complex and confusing concept (Garland, 2003; Lupton, 1993). Lupton (1993) explains that in its original usage, 'risk' is neutral and refers to probability or the mathematical chance of an event occurring; the risk of an event occurring could relate to either a positive or a negative outcome. However, within contemporary culture, 'risk' is often understood as a danger, an idea that is perpetuated by the growth of the field of risk assessment of environmental hazards, the rise of epidemiology in the realm of health and the pervasive media coverage (and politicization) of risk more generally (Lupton, 1999; see also Douglas, 1990)[32]. Ruhl

[32] Douglas notes that risk has entered politics in contemporary society and in doing so "has weakened its old connection with technical calculations of probability" (p. 2). She further asserts that the risk concept has come to the fore in politics because in the transition to modern industrial society "probabilistic thinking is pervasive in industry, modern science and philosophy...however, the risk that is a central concept for our

(1999) provides the further insight that in today's 'risk society,' the two meanings of risk (risk as probability and risk as danger) have been conflated so that "risk implies the probability of threat or danger" (p. 101) with the underlying assumption that risk is pervasive and ubiquitous.

Risk discourse in the realm of health, observes Lupton (1993), can be loosely separated into two perspectives, that of external risk and internal risk. The first views risk as a health danger to populations that is posed by environmental hazards such as pollution and nuclear waste. In this context, the health threat is viewed as an external hazard, out of the control of the individual. The second approach to health risk (internal risk) views it as a consequence of the 'lifestyle' choices made by individuals, and thus places emphasis on self-control. Lupton (1993) observes that in today's secular society, the notion of 'sin' can be relocated to the realm of risk. In the context of external risk, the 'at risk' individual is 'sinned against' (for example by environmental hazards perpetuated by large industry); in regards to internal risk, the risky individual is the 'sinner' making inappropriate lifestyle decisions and engaging in risky behaviour. It is the latter form of 'risk' that is the main focus of public health and more specifically, prenatal care advice.

Given the centrality of risk in contemporary society, it has received a growing amount of attention within the professional and academic realm (both natural and social sciences) over the past thirty years and there are a number of different approaches to analyzing risk. One common approach (especially within natural sciences and in industrial risk assessment) is the 'technico-scientific' approach (Lupton, 1999) in which risk is viewed as an objective phenomenon that can be measured through quantitative risk

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policy debates has not got much to do with probability calculations. The original connection is only indicated by arm waving in the direction of possible science: the work *risk* now means danger; high risk means a lot of danger" (emphasis in original, p. 2-3).

assessment techniques (e.g., determines the probability of a hazardous event and tries to control for this). In contrast to this approach, the sociocultural approach takes into account the broader social and cultural (and sometimes historical) contexts in which 'risk' as a concept derives its meaning and resonance (i.e., asks *why* we view an event as risky in the first place). In her book, *Risk and Sociocultural Theory*, Lupton (1999) suggests that three major theoretical perspectives on risk have emerged since the early 1980s and gained prominence during the 1990s: the work of Mary Douglas which takes a cultural anthropological approach to risk (i.e., focuses on the cultural construction of purity and the transgression of social borders); Beck's (1992) theory of 'risk society' which focuses largely on the globalization of risk (i.e., an examination of the macro-structural factors that have led to an intensification of concern about risk in late modern societies); and the governmental perspective of risk which views 'risk' as a governmental strategy of power by which populations and individuals are monitored and managed. The latter is especially relevant to my work because it facilitates an examination of health risks considered to be the responsibility of individuals (i.e., pregnant women) to control through appropriate lifestyle behaviours. However, before turning to a discussion of this literature, I will provide a brief overview of Beck's 'risk society' with attention to how it might be useful to my project.

According to Beck (1992) and other proponents of 'risk society' (most notably Giddens, 1991; 1998), the growth of science and technology in late modern societies has led to an increase in manufactured (external) risk - such as pollution, nuclear warfare, chemical residue. In other words, the risks produced under the conditions of late modernity have increased in magnitude and become globalized and are therefore more

difficult than in past eras to calculate and manage or avoid. As such, we live in a risk society.[33] What is fruitful about the theory of 'risk society' for my project is the centrality assigned to experts and media in mediating public understandings of risk. Because manufactured risks often are incalculable risks (i.e., manufactured risk leads to manufactured uncertainty), the public is increasingly dependent on expert knowledge and media coverage to help them to define/understand risk. Thus, while Beck (especially in his early work) tends to view risks as objective phenomenon that are proliferating out of control, he also draws attention to their mediation through social and cultural processes and it is the latter point which is useful to my own analysis.[34] Moreover, regardless of his epistemological position on the nature of risk, the key point is that we live in a society where we *perceive* that we are facing more and more risks. Feminist scholars (Lupton, 1999; Ruhl, 1999) have drawn on Beck's notion of risk society to make the point that in contemporary society, risk is central to pregnancy – it is ubiquitous and pervasive. Noting that medical professionals have added 'growing risk' to the existing categories of 'high risk' and 'low risk,' Ruhl (1999) explains that "there is no 'no risk' category. Threat is everywhere" (p. 101).

Risk: A Technology of Governance

Viewed through a Foucauldian lens, 'risk' is one of the "heterogeneous governmental strategies of … power by which populations and individuals are monitored

[33] As Beck famously argued, early modern industrial society (in the eighteenth and nineteenth century) produced 'goods' but contemporary industrial society produces 'bads.' As such, we are now in a stage of reflexive modernization or a critique of the processes of modernity. Dean (1999) suggests that modernity finds itself in a state of self-confrontation with the effects of risk society, effects that cannot be assimilated in the system of industrial society.

[34] In his original book, Beck was critiqued for moving ambivalently between two positions (realist and social constructionist) and in later work (Beck, 1995) he aimed to develop a position between the two. Lupton (1999) explains of his later work: "he puts forward the idea that 'real risks' exist and can be objectively measured through science but also supports the notion that what are considered to be 'risks' are conceptualized differently in different historical and cultural contexts" (p. 5).

and managed so as to best meet the goals of democratic humanism" (Lupton, 1999, p. 4). Much of the early writing around risk and governmentality focused on insurance as one of the many strategies of government that operates in the space between the individual and state (Defert, 1991; Ewald, 1991; Rose, 1993; for discussions of governmental perspectives of risk see Baker & Simon, 2002; O'Malley, 2008).[35] Ewald (1991) wrote a landmark paper on the development of governmental approaches to risk in which he traced the emergence of risk as a dominant way of knowing and intervening in the world, beginning in the nineteenth century with a focus on the rise of social insurance as a means of 'spreading risk' throughout the population. For Ewald, "risk is the product of insurance technologies that bring probabilistic methods to bear on aggregated data, producing actuarial representations of risk as an object that can be known and distributed" (c.f. Baker & Simon, 2002, p. 17). Thus, risk was not seen as intrinsically 'real' but rather as a certain way that problems are viewed (or imagined) and dealt with (O'Malley, 2008).[36]

Rose (1993; see also Rose & Miller, 1992) also contributed to the development of a governmental approach to risk as he explored the breakdown of the social logic of governance (social insurance or 'risk spreading' discussed by Ewald (1991)) and the emergence of a prudential insurance approach that emphasizes individual responsibility.

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[35] Actuarialism (which emerged in the seventeenth century but became increasingly prevalent in the nineteenth and twentieth century) entails evaluating the likelihood of events and quantifying the possible outcomes with the aim of minimizing losses (both financial and emotional) associated with uncertain and undesirable events. Insurance is a central form of actuarial risk management used to hedge against the 'risk' of loss through the practice of 'risk spreading' (O'Malley, 1996). By placing events and/or individuals in the context of population, that which on its own might appear random can be treated as predictable and calculable. Through the use of mathematical and statistical calculations, an individual's risk can be determined based on the group or cohort that they belong to.

[36] Ewald reminds us that notions of risk in insurance are linked with chance, probability and randomness instead of danger and peril (Ewald, 1991, p. 199) – although others provide a counter-argument to this, suggesting that in contemporary society, risk has entered into the political realm and weakened its old connection with technical calculations of probability (see Douglas, 1990; Lupton, 1993).

This shift in risk management strategies is in line with the previously noted emphasis on personal responsibility and individualism that is central to neo-liberalism. As O'Malley (2008) explains, "risk management...changed from a social or collectivized model to one focused much more on management by individuals on their own behalf, frequently in the name of 'freedom of choice' (p. 71). Thus, new self-governing entities are created through shifts in unemployment insurance (subjects are no longer 'beneficiaries' of social insurance, but 'active citizens' making themselves 'job ready') and changes in crime prevention (individuals are admonished not to make it easy for criminals and to seek the help of government and the police to manage their own crime risks). Moreover, social work (an innovation of the welfare state characterized by professionals seeking out individuals to share expert knowledge and produce responsible citizens) has been replaced by the private counselor or self-help manual as "practices whereby each individual binds themselves to expert advice as a matter of their own freedom" (Rose, 1993, p. 196).

A number of scholars have discussed how the neo-liberal emphasis on personal responsibility and individual risk management has become increasingly evident in health care systems and health promotion strategies in Western societies since the late 1970s (see Bunton, 1997; Castel, 1991; Lupton, 1995; MacNeill, 1999; McDermott, 2007; O'Malley, 1996; Petersen, 1997; Vertinsky, 1998; Wheatley, 2005; White, Young & Gillett, 1995). Good health and risk avoidance are viewed as lifestyle choices that are within the realm of personal control, and an individual not engaging in such behaviour is stigmatized as immoral and irresponsible. This mentality, termed the ideology of 'healthism' (Crawford, 1980), promotes the idea that involvement in health promoting

activities is a moral obligation, and according to Petersen (1997), is a manifestation of the "individual as enterprise" (p. 197) mindset which is characteristic of neo-liberal governance.[37] Indeed, the rhetoric of lifestyle management, the urging to avoid or eliminate risky behaviour and the ascendancy of an ethos of prevention were viewed as possible solutions to a fiscal crisis in health care (namely escalating health care costs and the notion that access to health care is a right) (Ingham, 1985; MacNeill, 1999; Wheatley, 2005).

Scholars have pointed out how, in contemporary society, the subject of health care is viewed more as a client or consumer of health than a patient (see for instance, Bunton & Burrows, 1995; Henderson & Petersen, 2002, p. 2-3; Lupton, 1995; Rose, 2001). The health consumer is entreated to lessen his/her dependence on public health care services (through actual policy changes whereby health care is privatized or where publicly subsidized programmes are downscaled), at the same time that a disciplinary regime of the body is promoted with respect to care of the body - based on the assumption that "subjects of risk will opt to participate in a self-imposed programme of health and fitness" (O'Malley, 1996, p. 199). Two closely related images recur: the responsible (moral) and the rational (calculating) individual, notes O'Malley (1996, p. 199). He goes on to explain:

> Guided by actuarial data on risks (e.g., on smoking and lung cancer; bowel cancer and diet, etc.) and on the delivery of relevant services (e.g., relative costs and benefits of public and private medicine), the rational and responsible individual will take prudent risk-managing measures. Within such prudential strategies, then, calculative self-interest is articulated with actuarialism to generate risk management

[37] A critique of healthism or the 'lifestyle' philosophy, note Petersen and Lupton (1996, p. 16), has centered on its failure to acknowledge the impacts of such factors as class, gender and ethnicity both on life chances and on those individual decisions predisposing to 'unhealthy lifestyles,' and on the consequent tendency to 'blame the victim' for what are seen as structurally induced problems (see Crawford, 1977).

> as an everyday practice of the self. This is backed up by a moral responsibility, or duty to the self. (p. 200)

Ironically, explain Henderson and Petersen (2002), the consumer-oriented model of health care is often presented in terms of personal empowerment, but "behind the rhetoric of 'freedom of choice,' 'right to know' and 'entitlement to participate' ...lie compulsions surrounding the exercise of choice and an array of predefined and limited options for action" (p. 3). The 'good consumer' is compelled to make certain (rational) choices, exhibit appropriate information-seeking behaviour and behave in prescribed ways (i.e., consult certain experts, take the 'right' medicine) and a number of scholars of the sociology of health and illness have questioned the extent to which this ideal of rational consumer behaviour meshes with the reality of people's everyday lives (Henderson & Petersen, 2002; Lupton, 1995; Lupton & Petersen, 1996). In my own analysis I draw on this previous literature to examine the manner in which the practice of pregnancy and exercise (and the pregnant exerciser) has been constructed in medical and health promotion literature.

While insurance as a form of risk technology has been a central focus of writings around risk and governance, there is also a growing body of literature focusing on the deployment of risk technologies in relation to health and medicine, particularly the rise of 'risk factor' epidemiology in the latter half of the twentieth century. Epidemiology entails the study of disease and illness as they occur within a defined population as opposed to individuals (see Armstrong, 1995; Castel, 1991; Gifford, 1986; Lupton, 1995; Rose, 2001; Susser & Susser, 1996). Within epidemiology, 'risk' is conceptualized in terms of 'risk factors' which are not direct *causes* of a disease but instead are characteristics that appear to be related to the occurrence of a disease in some way (i.e., 'risk' expresses a

statistical measure of the degree of association between a characteristic and a disease) (Gifford, 1986). Attention to risk factors intensified in the late 1950s in accordance with the creation of a new object of study for epidemiology: chronic disease. Scholars assert that with declining rates of infectious disease in advanced capitalist societies (and the widespread availability of penicillin) in the years following World War II, infectious diseases had seemingly been 'conquered' and there was a turn towards identifying the risk factors of chronic disease which required more sophisticated models of multiple causation as opposed to identifying a single pathological or social cause (Armstrong, 1995; Gifford, 1986; Susser & Susser, 1996; Weir, 2006). Rose (2001) explains that with the rise of 'risk factors,' the "binary distinctions of normal and pathological, which were central to earlier biopolitical analyses" are now organized within a variety of strategies that try to "identify, treat, manage or administer those individuals, groups or localities where risk is seen to be high" (p. 7).[38]

Castel's (1991) essay, *From Dangerousness to Risk*, was one of the earliest to examine risk technologies in relation to health and the implications of the application of this risk technology in how we are to be governed. In short, he mapped out the transition within the health profession from privileging clinical risk knowledge (based upon the characteristics of individual case studies observed by experts) to privileging epidemiological risk knowledge (calculated through the observation of patterns in anonymous populations of disease and the identification of associated risk factors). More specifically, Castel discussed the shift in psychiatric diagnoses over the twentieth century,

[38] Binary distinctions are still used as a risk strategy but are now part of a wider variety of strategies organized at a number of levels, including epidemiological strategies that seek to reduce aggregate levels of risk across a population, strategies for the management of high-risk groups and strategies based on the identification of, and preventive intervention for, risky individuals.

suggesting that there has been a move from diagnosing dangerousness (based on the manifestation of concrete symptoms) towards diagnosing 'risk' (based on the presence of characteristics identified as risk factors). He characterized the former as a disciplinary technology whereby the individual patient is examined (in a clinical environment), diagnosed as having an existing condition and then treated/restrained to govern the *possibility* of harm, and the latter as an actuarial practice in which the individual case is represented as part of a larger sub-population with known 'objective' statistical properties (O'Malley, 2008, p. 60).[39]

Castel explains that with the emergence of risk in psychiatry, or more specifically, by making the notion of risk *autonomous* from the notion of danger, the practice of psychiatry came to be seen as more 'objective.' Similar to insurance, rather than attempting to learn about a case in detail, a risk diagnosis identifies the presence of a risk factor and consigns the individual to a risk pool. Because aggregate 'objective' characteristics can be represented with statistical precision, they became regarded as real rather than simply hypothetical diagnoses of individuals based on medical opinion. Castel problematized this process as it masks the socially constructed nature of risk factors, explaining that "prevention, in effect, promotes suspicion to the dignified scientific rank of a calculus of probabilities" (p. 288). The result was the creation and justification of preventative strategies aimed at entire categories of people to 'reduce' risk (O'Malley, 2008, p. 60-61).

[39] Both types of risk knowledge (clinical and epidemiological) aim to render risks calculable and governable and are therefore normalizing – albeit the former are based on the characteristics of case studies of individuals and the latter calculated through the observation of patterns in anonymous populations of disease and the identification of associated risk factors (Lupton, 1999, p. 63).

Sociologists have extended Castel's (1991) examination of 'risk factors' and epidemiology in relation to the discourse of health and the body (see Lupton, 1995; Dean, 1999; Petersen and Lupton, 1996; McDermott, 2007; Gard & Wright, 2005; Ruhl, 1999; Weir, 1996; 2006). Petersen and Lupton (1996), for instance, note that epidemiology has become increasingly prevalent in contemporary health care regimes (i.e., the new public health) which follow a neo-liberal model of risk organization. Indeed, epidemiology as a risk technique helps to mobilize neo-liberal values of personal responsibility and minimal government intervention. Through statistical analysis, epidemiological risk factors are identified and subsequently used to encourage individuals to engage in appropriate (self-regulatory) lifestyle choices. Risk assessment (through the science of epidemiology) therefore facilitates 'government at a distance' in such a way that health promoters are not clearly seen to be directly intervening, coercing or punishing. They instead view themselves as working through the efforts of others, particularly by forging collaborative ventures and promoting community action (empowerment) (Petersen & Lupton, p. 19). In their efforts to identify and control the factors of risk, note Petersen and Lupton, health promoters have taken on the roles of expert administrators, programme coordinators and 'community developers.' The 'factors of risk' they identify are distributed throughout the social body to the extent that (responsible) individuals at every turn face the task of having to monitor, regulate and change (that is, refashion) themselves to avoid, modify, control and eliminate behaviours and situations deemed as 'risky' (p. 20).[40]

In her article, "The Meaning of Lumps: A Case Study of the Ambiguity of Risk," Sandra Gifford (1986) examines the difficulties that arise as risk-related knowledge about

[40] In their examination of the construction of epidemiological 'fact,' Petersen and Lupton (1996) question the apparent neutrality and objectivity of this practice, noting that what is routinely glossed over in the official accounts of epidemiological research...is the socially constructed nature of the findings" (p. 33).

breast cancer is translated from epidemiological findings to clinical knowledge and practice. She asserts that confusion about how to translate concepts of epidemiological risk into the clinical context arises because contextual differences in the meaning and use of the concept are not fully recognized. In epidemiology, risk from an exposure (i.e., the presence of a risk factor) is a quantitative concept that is calculable over a study population whereas in the clinical context, risk from an exposure to an individual patient cannot be calculated (see Weir, 2006, p. 65). There is therefore always an element of intrinsic uncertainty in the practice of clinical medicine because the doctor must translate generalized knowledge to the treatment of a specific individual, deciding if an epidemiological risk factor is clinically relevant – or in other words, if a statistic should be transformed into a physical entity.[41] Gifford argues that when epidemiological knowledge is inserted into the clinical setting, risk factors are often read as equivalent to "objective clinical signs of disease" (p. 222) and patients are treated (sometimes through invasive procedures) for risk factors on the assumption that eliminating them will improve their health (and prognosis) (see also Weir, 2006, p. 67).

Feminist scholars (Lupton, 1999; Weir, 1996; 2006) have also examined the mobilization of both clinical risk and epidemiological risk in the governance of pregnancy. Lupton (1999), for example, explains that both of these approaches serve to render the risks attendant upon pregnancy as "calculable and governable, thus bringing them into being as problems that require action" (p. 63). Both types of risk knowledge,

[41] For the clinician, "there is always a certain amount of uncertainty which cannot be measured. Risk then, for the clinician, takes on the added dimension of *unmeasured uncertainty*" - as opposed to the *measured uncertainty* of the epidemiologist who has the laws of probability at his or her disposal (Gifford, 1986, p. 220).

she asserts, are normalizing, locating the individual woman within a framework of comparisons to many other women:

> The collective results of diagnostic tests on populations establish a norm against which a particular pregnant woman's health and the development and growth of her fetus may be compared. Any major deviation from the norm is defined as 'abnormal', evidence of 'high risk' that requires further medical intervention. (p. 63)

Similar to Gifford (1986), Weir (2006) points to the difficulties that arise when epidemiological risk factors are simply folded into the clinical context, constructing 'clinical risk.' She illustrates how, beginning in the 1950s, risk techniques were attached to pregnancy and childcare creating a form of risk-based prenatal care that bound together categories of epidemiological risk with diagnostic information, test results and patient histories; the result was to make standardized prenatal risk assessment into a "higgedly-piggedly concatenation of epidemiological and clinical reasoning as risk came to invade the space of patient management, treated as equivalent to any clinical intervention" (pp. 3-4). She argues that clinical risk conjoins two conceptually distinct forms of health judgment: the judgment of risk (from epidemiological reasoning) and the judgment of the normal and the pathological (diagnostics).[42] According to Weir, the aggregation of heterogeneous and incommensurable forms of health reasoning makes clinical risk "analytically incoherent and intrinsically unstable" and she explains that although this incoherence has been "recognized and repeatedly contested within medicine and the

[42] Referring to the Ontario Antenatal Record (a standardized form used to assess pregnancy risk), Weir (2006) illustrates how diagnostic categories appear as risk factors (e.g., diabetes, renal disease without hypertension) with no clear demarcation between risk and diagnostics. With this elision, she argues, risk factors proliferate and the state of health becomes elusive, a condition of 'no predictable risk' – or, in other words, uncertainty (p. 67). Thus, risk encroaches upon the meaning of health and almost displaces it, exemplified by the fact that a Risk Level A in the form is a 'healthy pregnancy' with 'no predictable risk.' Health is defined in risk language, placed within a risk hierarchy.

allied health professions, uses of risk reasoning in clinical practice persist, the internal critique constantly forgotten" (p. 65).[43]

In later chapters I examine how knowledge based on epidemiological data has been translated into exercise guidelines and assessment tools to be used in the clinical context. I also illustrate how, in the context of the epidemic of obesity in contemporary Western society, physical inactivity itself has been identified as a risk factor in the development of 'maternal-fetal' disease and a discourse of epidemiological risk mobilized to urge pregnant women to be physically active.

The Body as a Project

In a society where risk and uncertainty are so prominent, social theorists argue that the body has taken on a new importance, becoming the target of many new health risk-management strategies (Giddens, 1991; Shilling, 2003). Williams and Bendelow (1998) explain:

> as the macro-social, economic and global environment becomes ever more unstable and uncertain, then new systems of surveillance and government are put into place in order to regulate and control the social and natural environment, including the body itself. Seen in these terms, the discipline, surveillance and control of bodies may effect an albeit precarious 'resolution' of the more global threats and dangers we face at the turn of the century – one in which the current bodily preoccupation with health and fitness in consumer culture play no small part. (pp. 72-3)

In this section, I outline the work of theorists who view the body as a project. This literature facilitates an examination of how pregnant women are positioned as 'at risk' and in need of managing this risk through 'bodywork.' I also provide a brief overview of

[43] Weir (2006) explains that the inclusion of diagnostic elements within prenatal risk assessment has been contested on the grounds that it simply records what would already be in a patient's chart, inflates the reliability of the risk tool, and initiates a course of care that would have occurred without the assessment tool (p. 67).

scholarly work examining the role that the consumer culture industry has played in perpetuating the preoccupation with the body in contemporary society.

The centrality of the body in 'risk society' has been the focus of prominent social theorists such as Anthony Giddens (1991) and Chris Shilling (2003) who view the body as a project to be worked at as part of an individual's self identity (see also Featherstone, 1991; Williams & Bendelow, 1998). Giddens (1991) elaborates on this process, suggesting that the decline in traditional knowledge and customs (especially religion) in the late twentieth century (what he terms 'high' modernity) has been replaced by an insistence that all knowledge is tentative, always open to contestation and change. In his view, the growth of science and technology has not achieved "certitude of rational knowledge" (p. 2-3) but rather has led to an increase in doubt.[44] There has been a proliferation of expert knowledge or "systems of accumulated expertise" that represent "multiple sources of authority, frequently internally contested and divergent in their implications" (p. 3). Thus, even the authorities who provide sound 'objective' knowledge can only be trusted until the next study is published. Similar to Beck (1991), Giddens points to a change in the nature of risk in contemporary society. He asserts that while there has been a reduction in the overall riskiness of certain areas and modes of life, there has at the same time been an introduction of "new risk parameters largely or completely unknown to previous era" (p. 4), including such things as nuclear weapons and the risk of nuclear warfare; ecological catastrophes due to technological/manufacturing sectors; collapse of global economic system. These changes then combine with the increasingly mediated nature of experiences, creating a cultural milieu of risk and uncertainty. It is in

[44] Doubt, he explains, is a "pervasive feature of modern critical reason [that] permeates into everyday life as well as philosophical consciousness, and forms a general existential dimension of the contemporary social world" (p. 3).

this atmosphere, he argues, that the construction of self identity takes on new importance, allowing the individual to gain a sense of control by making lifestyle choices and working on his/her body.

Building on the work of Giddens (1991), Shilling (2003) provides a more explicit explanation of the role of the body (and bodywork) in this reflexive project of the self:

> For those who have lost their faith in religious authorities and grand political narratives, and are no longer provided with a clear world view or self-identity by these trans-personal meaning structures, at least the body initially appears to provide a firm foundation on which to reconstruct a reliable sense of self in the modern world. Indeed, the increasingly reflexive ways in which people are relating to their bodies can be seen as one of the defining features of high modernity. (p. 2)

Recognizing that the body has become a project for many 'modern' persons, explains Shilling (2003), entails accepting that its appearance, size, shape and even its contents are potentially "open to reconstruction in line with the designs of its owner" (p. 4). It also involves a practical recognition of the significance of bodies as both personal resources and as social symbols which tell a story about a person's self-identity.

While Foucault did not use the term 'the body as a project,' his writings around 'technologies of the self' resonate with the idea of bodywork as a means of constructing oneself within power relations. Late in his career, Foucault shifted his focus from technologies of domination and power (characterized by the techniques of panopticism and biopower) towards technologies of individual domination or technologies of the self (see Foucault, 2003d).[45] He defined technologies of the self as those practices which permit individuals:

> to effect by their own means, or with the help of others, a certain number of operations on their own bodies and souls, thoughts, conduct, and way of being, so

[45] Foucault explained that in his work, he had always attempted a history of the organization of knowledge with respect to both domination and self, but that "perhaps I've insisted too much on the technology of domination and power" (2003d, p. 147).

> as to transform themselves in order to attain a certain state of happiness, purity, wisdom, perfection, or immortality. (p. 146)

This is not to say that Foucault no longer viewed disciplinary power as relevant - he viewed 'governmentality,' for instance, as capturing the encounter between the technologies of domination and technologies of the self. In these later years, however, he attempted to flesh out more fully how individuals begin to understand *themselves* as subjects within power relations.

Rose (2001) has extended Foucault's concept of technology of the self, explaining that while "the original biopolitical thesis implied a separation between those who calculated and exercise power and those who were its subjects" (p. 17), throughout the twentieth century "biopolitics was democratized" as an alliance formed between "political aspirations for a healthy population and personal aspirations to be well" (ibid.). And in the twenty-first century, he states, "selfhood has become intrinsically somatic" - the body is a key site for work on the self (p. 18). He goes on to explain:

> From official discourses of health promotion through narratives of the experience of disease and suffering in the mass media, to popular discourses on dieting and exercise, we see an increasing stress on personal reconstruction through acting on the body in the name of a fitness that is simultaneously corporeal and psychological. (p. 18)[46]

Of particular interest to Rose - and Foucault - is the ethics of bodywork.[47] In putting forth the concept of technologies of the self, Foucault was interested in exploring how an individual takes an active role in constructing the self as a moral subject within

[46] He terms the use of the body as a site of experiments with subjectivity (i.e., body work), "somatic individuality" (p. 18).
[47] Foucault's primary interest was in how practices of the self (often through work on the body) might serve as practices of freedom, free of power relations of modern society (Foucault, 2003e).

power relations, calling this the practice of ethics.[48] Rose (2001) introduces the concept of 'ethopolitics,' the politics of life itself and how it should be lived. He further explains that:

> in ethopolitics, life itself, as it is lived in its everyday manifestations, is the object of adjudication. If discipline individualizes and normalizes, and biopower collectivizes and socializes, ethopolitics concerns itself with the self-techniques by which human beings should judge themselves and act upon themselves to make themselves better than they are. (p. 18)

Rose asserts that in the twenty-first century, there has been a merging of biopolitics with ethopolitics, where the "ethos of human existence...have come to provide the 'medium' within which the self-government of the autonomous individual can be connected with the imperatives of good government" (p. 18). In this context, bodywork is a central ethopolitical strategy and in extending Foucault's ideas regarding technologies of the self to contemporary times, Rose argues that ethical work on the body (technologies of the self) is inextricably linked with governmental apparatus (merged with technologies of dominance). The notion of work on the body as an ethopolitical strategy is particularly interesting in relation to contemporary pregnancy where the emphasis on the health and well-being of the fetus has intensified. This shift towards focusing on the risk to the fetus (as opposed to the mother) has led to what Weir (1996) terms a "remoralization" of pregnancy. More than ever before, care of the pregnant body is positioned as both an ethical and moral project.

Other scholars (see Featherstone, 1991; Petersen & Lupton, 1996; Shilling, 2003; White et al., 1995) have also made the link between the body and the moral subject,

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[48] For Foucault, engaging in technologies of the self entailed engaging in a critical assessment of the moral code. I would argue that this does not necessarily entail a conscious critique of the moral code, and instead view 'technologies of the self' as practices in which one reflects upon and shapes an understanding of him/herself as a subject within power relations.

suggesting that the pursuit of health through work on the body has become a crucial means by which citizens can publicly express such virtues as "self-control, self-discipline, self-denial and will power – in short, those qualifications considered important to being a 'normal,' 'healthy' human being" (Petersen & Lupton, 1996, p. 25). Shilling further explains that in an era characterized by a political (neo-liberal) emphasis on self help and personal responsibility and consumer culture's fascination with the body beautiful, a tone and trim body is an important marker of moral worth. Striving for a toned and beautiful body – which significantly is equated with a 'healthy' body (see Featherstone, 1991; White et al., 1995) – fits in with the governmental strategy of contemporary health care or what Petersen and Lupton (1996) have termed the 'New Public Health.'

Within the social sciences, there is growing interest in how entrepreneurs in the health and fitness industry capitalize upon and further perpetuate a focus on the body as a bearer of symbolic value by flooding the market with a plethora of goods and services which themselves are imbued with certain (desirable) meanings such as 'health' and 'beauty' (see Bordo, 1993b; Featherstone, 1991; Rimke, 2000; Rose, 1991; Smith Maguire, 2002; Shilling, 2003; White et al., 1995). Shilling (2003), for example, directs our attention to how:

> consumer goods battle with each other in their attempts to make people's bodies look and feel reliable and sensuous, and provide programmes for people to achieve a skin quality and muscle tone which give off messages about health by *looking* healthy and youthful. (p. 5, emphasis in original)

Scholars have also emphasized the manner in which health discourses (and scientific 'fact') have become an important resource for individuals working within the health industry who promote healthy lifestyles and healthy consumer products (see Bunton &

Crawshaw, 2002; Eide & Knight, 1999; Jette, 2006; Madden & Chamberlain; 2004; Markula, 2001). As Bunton and Crawshaw (2002) explain, preventative health discourses promoting the avoidance of risk can be marketed within consumer cultures promoting an ethical, disciplined, ascetic bodily regulation" (p. 189). In a neo-liberal society inhabited by the entrepreneurial consumer-citizen, "contemporary health status is achieved by purchasing signs of a healthy lifestyle from low fat spreads to fitness club memberships" (ibid.).

The health and fitness industry can thus be viewed as a "complementary correlative of practices and techniques based on 'governmentality'" (Rimke, 2000). Referring to the rise of the popular self-help psychology literature over the past three decades, Rimke (2000) notes that "governmental-ethical practices underline the way in which what might loosely be called 'practices of government' come to depend upon, and operate through, 'practices of the self', such as those in popular self-help texts" (p. 71). The self help texts to which Rimke refers are akin to health and fitness literature in that the body and self are constructed as a project and individual consumers are encouraged to engage in practices of the self to improve themselves (Smith McGuire, 2002).

The workings of the health and fitness industry are often examined through a lens of political economy which, with its Marxist roots, has a very different concept of power than a Foucaudian analysis.[49] In my project, I draw primarily on a Foucualdian framework to examine the pregnancy fitness industry that has sprung up over the last several years. I am particularly interested in how the health and fitness industry offers individuals ethopolitical strategies to be a good (consumer) citizen - especially pregnant women who are responsible for two lives and are therefore the ultimate ethical subject. I

[49] See Pringle's (2005) article *Masculinities, Sport, and Power* for an excellent overview.

examine how the fitness industry reinforces neo-liberal ideals of personal responsibility for health, thereby functioning as part of the apparatus of governance while at same time making a profit - a fusing of political, ethical and economic domains. I pay particular attention to how (if) health discourses and 'truths' from the realm of medicine are translated to the popular literature and in doing so aim to illuminate the interconnections between "multiple domains of government and self-formation in which authorities seek to direct the conduct of individuals and individuals seek to act on themselves" (Dean, 1994, cited in Rimke, 2000, p. 71).

Substantive Literature

Medicine, Exercise and the Female (Reproductive) Body

There is a vast amount of feminist literature examining reproductive politics, much of which identifies medicine as an "agent of social control" in the lives of women and attempts to illuminate the construction of the female (reproductive) body as an object of the medical gaze (Lupton, 2003, p. 143).[50] A common theme to arise in these accounts is the manner in which the functions of menstruation, pregnancy, childbirth and menopause have increasingly come to be viewed as 'pathological' and in need of medical intervention (see for instance, Ehrenreich & English, 1989; Oakley, 1984).

In her seminal book, *The Captured Womb*, Oakley (1984) provides an historical account of the medical care of pregnant women (in Britain during the twentieth century), with the aim of deconstructing the taken-for-granted notion that pregnancy (previously considered a natural, social phenomenon) belongs under the jurisdiction of the medical

[50] It is important to note that there are tensions within this body of literature. Lupton (2003) explains that feminist writings about health produced in the 1970s which tended to view women's 'authentic' perceptions of their bodies as 'tainted' by medicine have been critiqued as overly simplistic by those who recognize that while medicine may be a source of women's oppression, it has also contributed to improvements in health and greater control over their fertility.

profession. She thus undertook a 'history of the present' to examine how the shift occurred, problematizing positivist truth claims of biomedicine which worked to control the female body. *The Captured Womb* is joined by several other excellent cultural histories of various aspects of pregnancy and childbirth (see Armstrong, 2003; Arney, 1982; Hanson, 2000; Kulka, 2005; Weir, 2006).[51] Of particular relevance to my project is the work of historians who have examined the medicalization of pregnancy in the late nineteenth and early twentieth century in the Canadian context. Wendy Mitchinson (2002), for example, provides a detailed account of the medicalization of childbirth in Canada from 1900-1950 while Arnup (1994) examines the early beginnings of the public health movement in Canada and more specifically the 'education' of motherhood (pregnant and new mothers). These historical accounts outline the growing concern about the health of the population, especially the infant and child, in the late nineteenth and early twentieth century,[52] and the system of medical surveillance that resulted. This previous research provides an important context for my own, raising questions with respect to medical perceptions of prenatal exercise during this time. It does not, however, focus on physical activity during pregnancy in any depth.

There also exists a vast and informative body of literature examining contemporary aspects of prenatal care and pregnancy, including new reproductive technologies (Conrad & Gabe,1999; Rapp, 1988; Remennick, 2006), legal issues around fetal rights (Armstrong, 2003; Bordo, 1993; Tsing, 1990; Weir, 2006; Wetterberg, 2004), the

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[51] See also Davis-Floyd and Sargent's (1997) anthology, *Childbirth and Authoritative Knowledge*, a collection of essays examining the different ways of 'knowing' about childbirth.

[52] These concerns spawned from the poor quality of health of military recruits for the Boer War (1899-1902) (in the British context) and WWI (1914-1918) (in both the British and North American context), as well as fears of depopulation (of the white Imperial nation) due to high infant mortality rates, falling birth rates and high rates of immigration (Arnup, 1994; Lupton, 1995; Oakley, 1984).

increased medicalization of pregnancy (Lee & Jackson, 2002), public health and popular literature discourses directed at pregnant women which entreat them to alter their daily behaviour to minimize risk (Lupton, 1999; Marshall & Woolett, 2000; Ruhl, 1999) and the commodification of pregnancy (Taylor, 2001), to name a few.

Ruhl (1999), in particular, provides an informative analysis of the way that an 'individualized risk model' of pregnancy (which emphasizes individual responsibility for and negotiation of risk) is mobilized in popular pregnancy manuals directed at middle class, educated women who, she asserts, are "precisely the population most invested in appearing as 'responsible'" (p. 103). She employs a Foucauldian framework with the aim of accounting for women's acceptance of and participation in the 'risk model.' Through her examination, she makes connections between the use of 'risk talk' in prenatal advice manuals and the larger practice of self government that occurs in advanced liberal societies. She argues that the individualized risk model of pregnancy makes a demand of women that is "simply unrealistic": that pregnant women be on their guard, every second of their pregnancy, for something, anything, which might prove to be the slightest bit harmful to their fetus – while at the same time overlooking the women's lack of control over uterine development (p. 110) (i.e., that pregnancy is not suited to actuarial risk technology). She contrasts the individual risk model of pregnancy to the social insurance model of pregnancy which spreads responsibility of risk evenly across the population. However, Ruhl pays little attention to exercise advice in the manuals and more importantly, while she examines how 'risk' is attached to pregnancy in the context of prenatal advice manuals, she does not examine the specific process by which risk is attached to pregnancy through the process of knowledge production.

Weir (2006) also examines the contemporary governance of pregnancy with a focus on the process by which 'risk' as a technology of governance is attached to pregnancy through knowledge produced by the medical profession. She conducts a genealogy of a new medical concept to arise in the twentieth century, the *perinatal* (the period immediately before, during and after birth), showing how it was accompanied by the formulation of *perinatal morality*, the reduction of which became a central biopolitical goal from the late 1950s onwards.[53] Weir examines the techniques put into place to reduce perinatal mortality, which included the introduction of a risk-based system of prenatal care (or standardized prenatal risk assessment) that identified 'high risk' pregnancies as the chief target for reducing perinatal deaths. She illustrates how this "vast and detailed implanting of a perinatal threshold" (i.e., the construction of the concept 'perinatal') troubled the idea that life begins at birth (2006, p. 5). Weir draws particular attention to the heterogeneity of risk techniques in the government of pregnancy, distinguishing between four distinct risk techniques active in the formation of the perinatal threshold: epidemiological, clinical, actuarial and legal risk. She also details the way that risk techniques shift and change when they are attached to different governmental complexes (e.g., health versus law) asserting that pre-existing forms of reasoning in a certain realm bind with risk in complex ways. Her project was in part a response to what she views as a lack of attention to the complexities of risk within the social sciences, as well as an overemphasis in the feminist literature on 'discipline' – that is, of the pathologization and medicalization of women's reproductive bodies by male

[53] Definitions of the perinatal period vary. Depending on the definition used, it starts at the 20th to 28th week of gestation and ends 1 to 4 weeks after birth.

doctors.[54] While Weir's work is specific to the Canadian context, her focus is not on the production of knowledge about exercise.

Just as there has been a paucity of research on exercise within feminist examinations of pregnancy, there has been little emphasis upon pregnancy in sociological analyses of exercise and fitness. In fact, while physical fitness is recognized as a technology for disciplining the body within the sociology of sport literature (see for instance, Cole, 1993; Hargreaves, 1987; Harvey & Sparks, 1991; Markula & Pringle, 2006; Pronger, 2002), there is only a small body of literature that engages in a detailed examination of how medical and scientific discourses have shaped (and continue to shape) 'truth claims' regarding women's physical culture practices. Vertinsky's (1988, 1994) examination of medical discourse in the late nineteenth century illustrates how women's physical fitness practices, in particular, were part of the apparatus which served to discipline the female body with the aim of (re)producing a healthy nation-state. Extending the work of Vertinsky (1994), Lenskyj (1983; 1986) and Verbrugge (2002) examine medical perspectives on women's exercise throughout the 1900s in Canada and the United States, respectively, both suggesting that concerns or anxieties around women's physical activity have been and continue to be rooted more in cultural concerns than biomedical 'fact.'

The work of Vertinsky (1988; 1994), Lenskyj (1983; 1986) and Verbrugge (2002) draws critical attention to the role medical practitioners and body experts have played in defining fitness practices for women, illustrating how concerns about women's

[54] As she explains "reconstructing the theoretical object as the 'government of pregnancy' in place of 'new reproductive technologies' leads to foregrounding the genealogical themes of risk, the conduct of conduct, liberalism and the liberal professions in relation to having children. Feminism is thereby moved away from an overconcentration on medical innovations and their supposedly invariant effects to placing more emphasis on the *means* by which the conduct of pregnancy is organized" (Weir, 1996, p. 375).

physicality are often rooted in and informed by larger social issues. More specifically, they show how ideas of questionable scientific merit have been framed as 'fact' and used to justify the prescription of social roles, and how the ambiguity of scientific findings continues to be used to rationalize the ongoing investigation of the female reproductive system. But while their work is informative on this broader level, it is limited with respect to a discussion focused on exercise during pregnancy. Although Vertinsky (1988, 1994) discusses medical prescriptions for pregnant women, her research is particular to the late nineteenth century while both Lenskyj (1983; 1986) and Verbrugge (2002) mention the issue only in passing.

Research focused specifically on socio-cultural and historical aspects of exercise *and* pregnancy during the twentieth century is limited. Artal and Gardin (1986; 1991) provide a useful (albeit brief) historical overview of exercise prescriptions for pregnant women from the late nineteenth century to the mid-1980s, drawing on academic medical texts as well as advice manuals for women.[55] They describe the moderate (and arbitrary) nature of exercise prescriptions for pregnant women in the late nineteenth century and the early decades of the twentieth century, suggesting that the advice was "derived more from the cultural and social biases of each era than from scientific investigations" (1991, p. 2). They also emphasize that ideas about the need for 'moderation' were maintained throughout much of the twentieth century – without scientific backing. The authors also discuss the development of specialized prenatal exercise programmes in the 1920s and 1930s which were designed to allow women a more natural childbirth experience, explaining that these programmes were viewed as new and radical concepts of prenatal

[55] Artal and Gardin's investigation of historical perspectives on exercise and pregnancy is the introductory chapter of an edited book (the first of its kind) on Western medical research focusing on prenatal exercise (see Artal & Wiswell, 1986).

activity. According to Artal and Gardin, advice books in the 1950s permitted light housework while prohibiting sport, while in the 1960s and 1970s, prenatal exercise programmes (previously viewed as 'radical') were established as permanent components of childbirth preparation. Acknowledging that these programmes fulfill an important educational role in "instructing women about the process of normal delivery," the authors critique them for creating a childbirth script that results in perceived failure for many women who have pregnancy complications and require medical intervention (and drug therapy). The chapter concludes with a brief discussion of exercise prescriptions in the 1980s, and the authors note the failure of the medical community to "research and establish prenatal exercise programmes systematically based on scientific rationale" (p. 5) before this time.

Rankin (2002) also provides an informative overview of medical ideas about exercise during pregnancy in her book, *Effects of Antenatal Exercise on Psychological Well-being, Pregnancy and Birth Outcomes*. Her historical review serves as a preface to the discussion of her larger study, a randomized control trial which investigated the effect of a structured exercise programme on healthy women during and after their first pregnancy. Rankin begins with a brief discussion of fifteenth to eighteenth century obstetrical ideas about exercise, explaining that a woman's social class was typically seen to define her experience of labor; it was believed that rich (sedentary) women had more difficult labours and poor, working women had easier labours. According to Rankin "the philosophy during the seventeenth and eighteenth centuries was to encourage women to exercise during pregnancy, albeit within the lifestyle and social limitations of this period" (p. 22) – although she also notes that during the seventeenth century there was

disagreement amongst obstetricians as to whether women should increase their exercise close to the time of delivery. Rankin charts of the development of ideas about exercise during pregnancy into the late twentieth century and concludes that despite the rise in research over the past two decades, findings remain inconclusive and "well-controlled studies are required to investigate in detail the effects of exercise during pregnancy. The potential impact of occasional, regular and prolonged exercise during pregnancy on outcomes of clinical importance for the mother and infants remains unknown" (p. 49).

Research specific to the topic of exercise and pregnancy in consumer culture is limited to a study by Dworkin and Wachs (2004).[56] In their analysis of *Shape Fit Pregnancy* magazine (from 1997 to 2003), the authors describe how it "embraces and even requires fitness for a smooth pregnancy and delivery" (2004, p. 614). Dworkin and Wachs note that instead of focusing on the health benefits of exercise during pregnancy, many of the pre-natal fitness articles emphasize how physical activity can help women "train for labour" and lessen the time it takes to "bounce back" (p. 615) from pregnancy. Indeed, they point to the ways in which the magazine positions new mothers as responsible for an additional 'third shift' of body work in order to get rid of baby fat and regain their femininity. The authors also observe that the text constructs the postpartum body as stressful and out of control, and then strategically draws upon the feminist discourse of empowerment to suggest that the new mother can regain control of her body through exercise. Significantly, the chores of the second shift (household labour and childcare) are positioned as a form of exercise that will help the new mother regain her pre-pregnancy figure. As Dworkin and Wachs (2004) suggest, this merging of household

[56] In their book, *Body Panic*, Dworkin and Wachs (2009) extend their examination of *Shape Fit Pregnancy* to include the additional years 2004-2006. Their updated study of the magazine largely confirmed the findings of their earlier analysis.

chores and childcare with bodywork serves to "(re)inscribe" (p. 610) women within the domestic realm. Such attempts to relegate women to the home are of course reminiscent of nineteenth century medical discourse around middle class women (Vertinsky, 1988; 1994).

The Next Step...

Although the research described above provides insight into the changing exercise prescriptions put forth by the medical profession over the years, as well as representations of a 'fit' pregnancy in popular culture, further investigation is required for several reasons.

First, there remains a lack of research examining exercise prescriptions throughout the twentieth century using a critical sociological perspective. Although the historical overviews provided by Artal and Gardin (1991) and Rankin (2002) are informative, they view the issue through a more science-based lens. While these authors recognize that social and cultural biases shaped medical advice to pregnant women in the past, they privilege the notion of 'objective' scientific knowledge (which they suggest is characteristic of more recent studies of exercise during pregnancy) as a remedy to these earlier prescriptions. Thus, as opposed to Vertinsky (1994) and Verbrugge (2002) who shine a critical light on the way that physicians and other 'body experts' have mobilized the authority of 'science' to define social roles for women, as well as theorists who critique the very notion of 'objective' science more generally (Haraway, 2004; Latour, 1993), Artal and Gardin (1991) and Rankin (2002) advocate the usefulness of such scientific investigations, viewing them as rigorous and objective. This is not to say that their work is not useful, but rather to suggest that further exploration is required,

particularly an examination of the production of medical knowledge through a social constructionist lens, an approach that facilitates the identification of the contingency of medical knowledge. Moreover, these authors do not examine exercise during pregnancy (and the mobilization of the discourse of risk) with an eye towards how exercise may act as a technique of governance, a tool in the regulation of the health and well-being of the population.

Second, there remains a need to examine medical prescriptions for pregnant women in the Canadian context, taking into consideration how broader historical and social issues might have shaped the advice provided (e.g., fears about race suicide in the early 1900s, second wave feminism, the recent obesity epidemic). While there has been research conducted in the Canadian context which focuses on how larger political issues impacted childbirth (Mitchinson, 2002) and efforts to 'educate' mothers in Canada (Arnup, 1994), these analyses do not focus on prenatal exercise advice and are specific to the first half of the twentieth century. Similarly, neither Artal and Gardin's (1991) nor Rankin's (2002) historical examinations of exercise and pregnancy focus on the Canadian context.

There also remains a need to listen to health care professionals about their knowledge of and attitudes towards prenatal exercise, as well as how they communicate these ideas to pregnant women. Scholars have interviewed doctors to gain insight into the advice that physicians gave to pregnant women and mothers in the early twentieth century (Arnup, 1994) and medical doctors' understandings of fetal alcohol syndrome (Armstrong, 2003). However, there has been no such investigation of health professionals' understandings of prenatal exercise and such an examination will make a

significant contribution to the feminist literature on pregnancy as well as the sociology of health and fitness literature.

Finally, there remains a need to examine how messages in the various 'fields of text' (i.e., academic medical discourse, popular fitness texts, governmental health promotion strategies and 'doctor talk') interact with each other, constructing new meanings about physical activity during pregnancy. This interaction or play of meaning between and across texts is termed 'intertextuality' (Locke, 2004).[57] Pronger (2002) has carried out such an investigation of the technologies of physical fitness more generally, and Hanson (2004) has similarly explored the cultural history of pregnancy with a focus on the intertextual nature of various sites of communication. Lacking is research specific to exercise and pregnancy.

In addition to addressing these substantive gaps, my project makes two significant theoretical contributions. The first pertains to the literature on 'risk' as a technology of governance. In many accounts of risk, especially those focusing on health and the body, the heterogeneous nature of risk techniques are not examined in-depth (see O'Malley, 2008; Weir, 1996; 2006). Instead, scholars often refer to a general shift in contemporary Western society towards neo-liberal risk organization whereby individuals, as rational and calculating subjects, are positioned as personally responsible for managing risk in order to be good (moral) citizens. While providing useful insights, this generalized view of 'risk' does not attend to the diversity of risk techniques that come to be organized with the aim of addressing certain problems identified under a political rationality – nor the manner in which risk techniques shift when they are attached to different governmental

[57] Intertextuality can refer to the way that a writer borrows and transforms an existing text (e.g., a magazine writer reporting a scientific study) or to a reader's referencing of one text in reading another.

complexes (i.e., health versus law) (a few notable exceptions being the work of McDermott, 2007 and Weir, 2006). The result, explains O'Malley (2008), is that our understanding of how risk works as a governmental strategy becomes a grand theory or metanarrative of risk. My genealogy of the governance of the active pregnant body is designed to address this critique by providing a more detailed and nuanced account of the operation of risk in the governmental complex. In particular, it contributes to our understanding of how the consumer culture industry functions as part of the apparatus of governance while at same time making a profit – and the role of 'risk' in this equation. To date, there have been few in depth examinations of how 'risk' functions as a strategy of governance in neo-liberal consumer culture (exceptions being Bunton, 1997; Bunton & Crawshaw, 2002; Eide & Knight, 1999), and none in the context of exercise and pregnancy.

Second, this project contributes to a growing body of literature assessing the usefulness of Foucault for feminism. A central critique of Foucault has been the androcentric nature of his work. Feminists who feel that Foucault's notion of the body and power are significant to (and in line with) the feminist project have built upon and extended his work to address his lack of focus on the female body. This does not entail an unequivocal acceptance of his ideas, but an examination of how/if they work for feminism, keeping certain aspects and offering alternative suggestions (see Bordo, 1993a; Diamond & Quinby, 1988). My project adds to this body of 'feminist and Foucault' literature as I examine how his ideas around power and the body can be used to examine the issue of exercise during pregnancy more critically.

This project also makes two key methodological contributions. First, it addresses Harwood's (2009) call to examine multiple pedagogical sites (or sites of communication) to better understand how certain knowledges or ways of knowing are put to use in the discipline and regulation of bodies. My focus on medical knowledge regarding exercise during pregnancy in three different sites of communication will therefore serve as something of a case study for the use of biopower as an empirical research tool.

The second methodological contribution is my combination of the tools of archaeology and genealogy to examine issues regarding fitness, health and the body. In their 2006 publication, *Foucault, Sport and Exercise*, Markula and Pringle note that while genealogical analyses of issues around the active, sporting body are increasingly prevalent in the sociology of sport and fitness, they are unaware of any studies that overtly utilize archaeological methodology (although Pronger (2002) and Vertinsky (1994) both delve into the production of medical ideas about physical fitness). In order to address this gap, Markula and Pringle (2006) outline how to conduct an archaeological and genealogical analysis of the discursive construction of physical fitness - and Liao and Markula (in press) subsequently combined the two methods in their textual analysis of media representations of women's professional sport. My project contributes to this exploration of how to more fully use Foucault's methodological techniques to study the production of knowledge about the active body and how this knowledge is put to use in the regulation of bodies.

By tracing the changing ideas regarding physical activity and pregnancy over the past century and drawing together several different perspectives from across disciplines, I aim to illustrate how knowledge shifts and changes, creating a messy mixture of

statements and ideas, some of which count as 'truth' and others which are dismissed, with this 'truth' status also always open to contestation and change. The use of historical and sociological tools to examine an issue that is typically specific to the realms of kinesiology, sport medicine and gynecology (and therefore examined through a more positivist lens) promises to make a valuable contribution to our understanding of exercise during pregnancy. My goal is to build bridges between disciplines and open up an interdisciplinary dialogue, with the overall aim of troubling taken-for-granted ways of thinking about the active, pregnant body.

CHAPTER THREE

Methodology

In this chapter, I provide an overview of my research approach which consists of a combination of Foucauldian research methodology, namely archaeological and genealogical analysis. By combining these two approaches I aim to better understand how medically-sanctioned exercise practices for pregnant women have been formed within the larger power nexus of prenatal care in Western society. The chapter begins with an overview of the two terms and their relation to each other as methodological tools. With this background I discuss and provide a rationale for the 'fields' that my examination of exercise and pregnancy discourses encompasses. I then move into a description of (and rationale for) my sample within each field (i.e., the texts and groups of statements examined). Following this I further explain my data analysis technique(s). Archaeology and genealogy do not lend themselves to a clear recipe or approach for data analysis as they serve more as conceptual tools that provide a lens through which to examine the issue of exercise and pregnancy. However, I attempt to clarify my own approach as much as possible – explaining the broad technique used when examining the vast amount of primary data presented in the first three results chapters. I also provide a more detailed explanation of how I analyzed the contemporary popular literature and the physician interviews.

Methodological Framework

The research questions are approached using a combination of Foucauldian research methodology: archaeological analysis to examine the discursive structures or rules of formation which shape knowledge - what is to be known or considered 'true' -

about exercise and pregnancy, and a genealogical analysis to examine the power relations involved in the discursive production of 'truths' and the possible effects of discourse on individual bodies and the social body (Markula & Pringle, 2006; Liao & Markula, in press).[58] While archaeology and genealogy may be identified as different modes or methods of enquiry, they work in conjunction to facilitate the "insurrection of subjugated knowledges" (Foucault, 1980, p. 81) – often local (popular) knowledges that are disqualified due to lack of scientific authority – and to make use of this knowledge in a tactical manner, that is, to resist oppressive social practices (p. 83).[59] In the essay "Two Lectures," Foucault (1980) discusses the link between archaeology and genealogy:

> If we were to characterize it in two terms, then 'archaeology' would be the appropriate methodology of this analysis of local discursivities, and genealogy would be the tactics whereby, on the basis of the descriptions of these local discursivities, the subjected knowledges which were thus released would be brought into play. (p. 85)

Or, as Liao and Markula (in press) state in more succinct terms: "if an archaeological analysis identifies discourses, a genealogical analysis connects the discourses to the operation of power at its cultural and historical context" (p. 70).

Archaeology

Foucault used the term *archive* to refer to the set of unwritten discursive rules which limit what can be said and what is counted as worth knowing and remembering (Mills, 2004, p. 57) and his archaeological analyses were concerned with excavating the

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[58] I hesitate to classify archaeology and genealogy as either 'method' or 'theory' as they encapsulate both, allowing for the bridging of theory and method. Furthermore, and as Mills (2004) explains, "Foucault's work is not a system of ideas nor a general theory…[and] as he himself says: 'All my books…are little tool boxes…if people want to open them, to use this sentence or that idea as a screwdriver or spanner to short-circuit, discredit or smash systems of power, including eventually those from which my books have emerged…so much the better'" (p. 15).

[59] Indeed, while Foucault characterized his early research regarding the rise of the human sciences as archaeological analyses, and his examinations of the history of the prison and of sexuality as genealogies, in these later works he used a combination of the two methods (Markula & Pringle, 2006).

archive to reveal the "interplay between discourses and the associated set of rules that shape/constrain reality, and guide social practices" (Markula & Pringle, 2006, p. 31). His primary interest, explain Markula and Pringle (2006), was in examining how knowledge that produced scientific classifications and dividing practices was "created, legitimated and mutated" (ibid., p. 26). He proposed that this could be done by tracing the discursive formation of a concept (for example appropriate prenatal exercise) through an examination of its historical development. In his work, Foucault showed that within certain time periods there is a tendency to structure thinking about a subject in a certain way and to develop certain procedures and supports for this way of thinking (e.g., detailed tables to assist categorization that were popular in the eighteenth century and the 'evidence based medicine' movement in the contemporary context). It is these rules of formation (*discourse as a whole*) that ultimately give rise to *discourses* as a *group of statements* that are sanctioned by institutions and considered 'true' so that they have a profound influence on the manner in which individuals act and think (Mills, 2004).

He called the set of discursive structures within which a culture formulates its ideas the *episteme* (i.e., the ground of thought on which at a certain time some statements and not others will count as knowledge) and he was interested in ruptures in the episteme at certain moments in a culture, where some of the rules and structures organizing discourse shifted to match the new environment, leading to overlaps, breaks and discontinuities in knowledge. As I mentioned in the literature review, attention to these ruptures or 'discontinuities' allowed him to challenge the notion of the linear progress of cultures/ideas (see Mills, 2004, p. 55; Markula & Pringle, 2006, p. 27).

In my own project, I adopt elements or tools of an archaeological analysis in order to better understand the 'thought structures' or 'rules of formation' underlying the discursive production of knowledge about pregnancy and physical activity (see Mills, 2004, p. 49). By examining medical documents and texts I gain insight about the procedures, support structures, criteria of evidence and forms of proof (i.e., the discursive practices) that determine what counts as knowledge/truth and therefore support certain ways of thinking about exercise and pregnancy, and ultimately, the prescriptions given to women. I am also interested in the shifts or breaks in the rules or discursive structures – or what Foucault termed the ruptures in episteme. In my analysis, I identify two key points of discontinuity in the thinking about pregnancy and exercise (the late 1960s/early 1970s and the late 1990s/early twenty-first century) and suggest that these shifts were/are tied to changes in the larger social context, the women's movement in the case of the first and the obesity epidemic in the latter.

Genealogy

In order to examine how knowledge about exercise during pregnancy turns into a form of practicing power I draw upon aspects of Foucault's genealogical approach. Through a Foucauldian lens, when knowledge is accepted as 'truth,' it becomes a dominant discourse that shapes our understanding of a subject or issue (often by telling us what is 'normal' or 'natural'). It also has the potential to shape the way that we act in the world, largely through the establishment of practices, techniques, and/or modes of surveillance that function to discipline/regulate bodies. In broad terms, the aim of a genealogy is to examine how discourse functions in the power/knowledge complex,

mainly by examining how discourse is put to use (i.e., what effect or practice is produced through the discourses).

Foucault's idea of genealogy was influenced by Nietzsche's method of tracing the history of concepts and ideas (Burr, 2003). In his essay "Nietzsche, Genealogy, History" (2003b), Foucault explains that genealogy differs from a 'traditional' historical methodological approach in that it is opposed to the search for 'origins' (the innate meaning or 'essence') of an idea, concept or knowledge and instead emphasizes that what we accept as 'truth' is born from chance. He elaborates that: "a genealogy of... knowledge will never confuse itself with a quest for their 'origins,' will never neglect as inaccessible all the episodes of history. On the contrary, it will cultivate the details and accidents that accompany every beginning" (p. 354). Thus, a genealogical analysis seeks to untangle past events to reveal traces of the influence that power has had on the construction of 'truth.'

In a related point, a genealogical approach does not view history as a linear development or 'continuous' (as is often the case with traditional historical methodology) but instead emphasizes discontinuity and rupture.[60] Burr (2003) nicely sums up Foucault's method of tracing the history of ideas and concepts (genealogy) by explaining that:

> rather than showing how the past has inevitably led to the present, Foucault was concerned to show the irregularities and discontinuities in history, to reveal subjugated knowledges and to disrupt the tendency of historians to create 'grand narratives' which smooth out these inconsistencies. (p. 203)

[60] Foucault (2003b) explains that genealogical analysis consists of three modalities (which are reminiscent of the three modalities of history recognized by Nietzsche – but metamorphosed). It is parodic (opposes any type of analysis as the recognition of reality - of how things 'really' happened); it is dissociated (it opposes research as a continuity or representative of tradition); it is sacrificial (it does not aim to excavate one 'truth' but assumes knowledge as a form of practicing power) (see Markula & Pringle, 2006, p. 54-5 for an example of how to apply these modalities to the analysis of fitness).

For Foucault, a central aim in the analysis of a concept or idea is to retrace the historical knowledge of struggles that occurred over time.

Finally, through his genealogies he wished to expose a "body totally imprinted by history" (Foucault, 2003b, pp. 356-7). That is to say, Foucault asserted that individuals are largely unaware of the socially constructed nature of their sense of self and he aimed to illustrate how the illusion of bodily coherence has been constituted through contingency, chance and accidents – not through a rational process (Markula & Pringle, 2006, p. 33). Indeed, Foucault's central project was to decentre the subject and bring to light the socially constructed nature of the 'self.'

A genealogical approach encapsulates many of the ideas concerning power relations and the body discussed in the literature review (indeed, these ideas were drawn from his genealogies of the penal system and sexuality which I discussed in the previous chapter). While it does not provide a 'recipe' for examining power relations, it does provide a lens through which we can read discourse in much the same way that I described governmentality (in the literature review) as an analytical tool for examining the links in the workings of power at both the local and State (or micro and macro) level. Indeed, governmentality may be viewed as part of the larger genealogical toolkit – albeit more refined as it makes explicit its examination of the link between political rationalities (and the problems identified through a certain discursive framework) and techniques or strategies of governance that emerge (which aim to provide a 'solution' to the problems identified). In a later section of this chapter (analysis), I lay out a loose framework for how I went about analyzing my data to examine power relations around exercise and

pregnancy. First, however, I outline the fields or sites of communication that I examined and then describe in more detail my sample of texts.

Fields or Sites of Communication

In order to examine the construction of knowledge about exercise during pregnancy and how knowledge is put to use in the control of the pregnant body, I examine three sites of communication or discursive fields in which groups of statements or 'discourses' about exercise and pregnancy circulate. There are a number of different ways of constructing an event, object or person both within and between discursive fields. It is therefore instructive to examine several different fields to get a better sense of the various statements in circulation, how/if statements cohere to form discourses (groups of sanctioned statements), the place of opposing statements in relation to dominant discourses and how/if truth claims are put to use in the control of bodies (Foucault, 1990, p. 100).

I am particularly interested in how discourses in different fields or sites interact and play off the meanings of those circulating in other sites and look to Pronger's (2002) textual analysis of the techno-science of fitness practices for guidance in this respect. Pronger notes that the various texts of the technology of fitness do not exist independently of one another but constitute an "intertextual ensemble, both reflecting and producing the socio-historical contexts in which they operate" (p. xv). He explains, for instance, that:

> the popular image of the lean, muscular body textually rendered in fashion magazines reflects the scientific texts on the physiology of exercise and muscular development; these bodies are the products of scientific knowledge. Similarly, the socio-cultural desirability of the lean, muscular body informs scientific research as the object that the technology of physical fitness can produce; the development of

> commercial products and the hope for resulting financial profit funds scientific research on…exercise machines and running shoes. (p. xv)

Pronger examines five fields of texts (scientific papers on physiology/psychology of fitness; government publications and policies on health and fitness; texts of academic exercise science; popular texts of physical fitness; and physical fitness products) and notes that while parts of the intertextual ensemble may vary, overall they work together to create a common theory or philosophy of what the body is and should be.[61]

Valerie Harwood (2009) also stresses the importance of looking at multiple sites of communication when examining issues around the body, health and power relations. She is concerned with biopedagogies, practices that are linked to the biopolitical in that they impart knowledge about how to live, how to eat, how to move – with the aim of regulating the population and controlling life (bios) at the level of the State. She asserts that biopedagogies occur in "myriad political sites involved in the construction of identities that instruct and form meaning" (p. 15) and encourages researchers to examine various sites of communication in order to better understand the workings of biopower.

Following these examples, I focus on three 'fields' or 'sites of communication' pertaining to physical fitness during pregnancy, examining how this 'intertextual ensemble' works to create certain meanings about exercise and pregnancy, while limiting others, but also looking for contradictory messages and/or complexities between the three realms of discourse. The first field that I examine is the scientific realm. Although I provide more detail about my actual sample in the following section, in broad terms I focus on obstetrical texts and articles in medical and trade journals. These texts are

[61] Acknowledging that representations of the body and fitness practices differ in the various texts that he studied, Pronger suggests that "throughout the ensemble there is a common, essential…reading and writing of the body, of its future, and of its place in the political and ecological scheme of things" (p. 145).

particularly useful for an archaeological analysis as they provide insight into the discursive structures and rules that allow for the production of certain knowledges and the erasure of others. They also reveal something of the struggles and power plays involved in what knowledges are accepted as 'true.' The second field that I examine is the popular literature, or the discourses directed to women through government texts and publications, as well as women's magazines and books. The final field that I examine concerns doctor's understandings of exercise and pregnancy or what I call 'doctor talk.' The two latter fields (popular literature and doctor talk) provide insight into how/if medical knowledge is mobilized and put to use, how/if information is changed for popular consumption, as well as how/if it is disputed and other knowledge or ideas disseminated.

Field 1: Scientific Texts

Rationale

Medical journals and texts are an important source of information for historians, and within feminist research there is a rich tradition of examining such texts to learn more about the medical knowledge circulating during a certain time period (see for instance, Arnup, 1994; Barker, 1998; Vertinsky, 1988; 1994). Acknowledging that it is difficult to know how influential or representative these texts were, Mitchinson (1991) argues that they provide researchers with a sense of the issues of the time as these journals were a venue for physicians to share their knowledge and express their concerns. Medical literature also provides important insights to feminist researchers examining contemporary medical perspectives of the female body, and accordingly has been drawn upon by scholars interested in examining power relations as they relate to the female

body and issues around reproduction (see Armstrong, 2003; Martin, 1987; Rudolfsdottir, 2000; Watkins, 1998). As Armstrong (2003) explains, medical literature provides a "window onto the process of knowledge formation in medicine" (p. 77). Finally, and as I have found in my own investigation of exercise and pregnancy, a concentrated examination of the medical literature reveals something of the struggles and power plays involved in what knowledges are accepted as 'true.' A close examination of medical texts is also a central aspect of a genealogical approach which entails retracing the history of the struggles of knowledge about a concept or idea (giving voice to subjugated knowledge).

Sample

Medical journals. In collecting my sample, my goal was to look at a diverse range of medical texts so as to gain access to the various discourses in circulation. My method of collecting data varied according to the time period that I was collecting it from, mainly because studies published prior to the 1950s are not accessible through an online search engine. Accordingly, I break up my explanation of data collection by periods, first focusing on 1903-1950.

1903-1950: For this first period, I located relevant articles by searching the Index Medicus print index which is, in essence, a hard copy equivalent to present day on-line search engines, such as PubMed.[62] For each year, Index Medicus provides a record of medical and scientific articles published in a wide range of journals, listing the articles under various keywords.[63] I searched the index of each volume using a range of search terms chosen to facilitate the identification of articles pertaining to pregnancy, prenatal

[62] I conducted the search from mid-June to mid-July 2007.
[63] I looked at the following volumes of Index Medicus: Index Medicus (1903-1920) (Series 2); Index Medicus (1921-1926) (Series 3); Quarterly Cumulative Index Medicus (1927-1956) (Series 4).

care and physical activity/exercise (see Appendix A for list of terms used).[64] Using this search method, I was able to review the titles of articles published in a range of Canadian, American and British journals, including three journals of particular interest: the *Lancet*, the *New England Journal of Medicine (NEJM)* (published by the Massachusetts Medical Society from 1928-1950)[65] and the *American Journal of Obstetrics and Gynecology*.[66] The first two journals were, at the turn of the nineteenth century, two of the most popular and widely read peer-reviewed medical journals in the world, while the latter was an important source of information on gynecological and obstetrical issues. I felt that it was important to look at journals relevant to Western medicine in general (and not just specific to Canada) for these texts were likely influential to Canadian doctors. Indeed, in her examination of late nineteenth century medical discourse, Vertinsky (1994) notes a striking similarity between the writings in British and American medical journals, suggesting that there was a significant amount of information exchange across the continents. I observed a similar situation with respect to knowledge-sharing between Britain and the Americas and found that there was a close connection between the literature/ideas circulating in Canada and the United States, likely due to their geographical proximity.

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[64] Based on my review of the titles, I identified articles of possible interest which I then attempted to collect and review. I collected and read roughly 120 articles although only a small portion of articles retrieved through this search method had exercise during pregnancy as their primary focus. Many of the retrieved articles pertained to prenatal care and pregnancy complications (especially causes of miscarriage) more generally, as well as issues concerning pregnant women in the workplace.

[65] The *New England Journal of Medicine* was called the *Boston Medical and Surgical Journal* from 1828-1928.

[66] The *American Journal of Obstetrics & Gynecology* was formerly called the *American Journal of Obstetrics and Diseases of Women and Children* which was founded by Benjamin Franklin Dawson and published from 1869 to 1919 before succumbing to financial difficulties. The following year, the journal was renamed the *American Journal of Obstetrics & Gynecology* (published by the C. V. Mosby Company, now Mosby, Inc.) (http://www.ajog.org/content/history, accessed April 19, 2009).

Other journals of note included in the Index Medicus database were *Hygeia* (a publication of the American Medical Association that was intended for the general public) and the *Canadian Journal of Public Health* (1910-present).[67] The *Canadian Journal of Public Health* was one of two central Canadian medical texts published in the first half of the century that was consistently maintained - unlike many of the journals published in the early twentieth century which would go out of print after several years (Roland & Potter, 1979). I was also interested in relevant articles published in the other major Canadian medical journal in these early years, the *Canadian Medical Association Journal* (*CMAJ*) (1911-present) and was able to access this journal through the PubMed Central online database.[68]

1950-Present: Much of the data for this time period was collected through a search of the online database, PubMed. The PubMed database includes over 16 million citations from MEDLINE and other life science journals for biomedical articles (from the 1950s to present).[69] The online search information was utilized in two different ways. First, I used it to get a sense of the relative amount of research published (by year). In doing so, I followed the protocol used by Armstrong (2003) in which she quantified all of the research studies occurring on Fetal Alcohol Syndrome (FAS) following its initial 'discovery' in 1973. In her case, she observed a marked increase in research in 1981, the year the Surgeon General recommended that pregnant women avoid alcohol

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[67] First called the *Public Health Journal* (1910-1928), this journal was renamed the *Canadian Public Health Journal* (1929-1944) and then the *Canadian Journal of Public Health*. *Hygeia* originated in 1923 as a sideline by the American Medical Association with the aim of promoting health among laypersons and educators ("Medicine's Journal," April 13, 1936).

[68] Although there is not a search engine, I looked at the table of contents for every issue of *CMAJ* from 1911-1950, flagging articles related to pregnancy (especially those focusing on prenatal care).

[69] The actual searches were conducted between February 2, 2008 and April 8, 2008 although I subsequently used the 'article alert' feature so that I receive weekly updates on any articles containing the terms 'exercise and pregnancy' or 'prenatal exercise.'

consumption. I also examined the publications on prenatal exercise with an eye towards the changes in the type and number of publications and how these changes might relate to the wider socio-cultural context. By taking this 'broad' view, I was able to observe trends in the medical literature (e.g., the controversy over 'how much' is safe that occurred throughout the 1980s, the growing attention to exercise as a way to treat gestational diabetes from the mid-1990s onwards and the current attention to the issue of pregnancy and obesity).

I also examined some of the articles in more depth - although a close examination of each paper was not possible due to the volume of literature; for instance, entering the search term 'exercise and pregnancy' yielded over two thousand hits (although not all of the articles are pertinent). However, in the earlier decades (1950s to 1970s) relatively fewer articles were published as compared to the period 1990-present. As such, I varied my data collection (and review) technique to correspond with the change in the amount of data available (see Appendix B for a further explanation of data collection).

Medical/obstetrical texts. I also looked at several key obstetrical texts that were written by leaders in the field and were often referred to in journal articles as well as other scholarly research on pregnancy and obstetrics.

- *The Principles and Practice of Obstetrics* (1913); by Joseph DeLee
- *Expectant Motherhood: Its Supervision and Hygiene* (1914); by J.W. Ballantyne.
- *Need Our Mothers Die?* (1935); a study made by a special committee of The Division on Maternal and Child Hygiene.
- *Antenatal and Postnatal Care.* (1951); by Francis James Browne.

- *Historical Review of British Obstetrics and Gynaecology (1800-1950).* (1954); Edited by J. M. Munro Kerr, R. W. Johnstone, & Miles H. Phillips.
- *Exercise in Pregnancy* (1986; 1991) by R. Artal Mittelmark, R. Wiswell & B. Drinkwater.

Field 2: Popular Women's (and Health) Literature

Rationale

Medical advice manuals for women and medical articles published in women's magazines are also useful texts in the study of medicine and the female (reproductive) body. For those working from a historical perspective, they are a reminder of the relationship that existed between the physician and patient (Mitchinson, 2002). As Mitchinson (2002) explains, they provided her with "the opportunity to see what women were reading about pregnancy and childbirth, and how the advice was couched when they, rather than medical professionals, were the recipients of it" (p. 17). Along these lines, there is a tradition of examining 'popular' medical literature in both the historical (see Arnup, 1994; Mitchinson, 1991; 2002; Vertinsky, 1994) and contemporary context (Bunton, 1997; MacNeill, 1999; Madden & Chamberlain, 2004; Markula, 2001) to gain insight into the knowledge circulating about women's health. Within cultural studies, more generally, popular texts are a rich source of data for researchers interested in the interplay of medicine and the mass media (Seale, 2002) as well as scholars interested in representations of femininity and the sporting body (Duncan, 1994; MacNeill, 1999; Markula, 1995).

Specific to my project, I found that an examination of various women's magazines, popular advice manuals and government publications provided additional

data about the dominant (and alternative) medical views regarding physical activity during pregnancy over the time period of interest and, of particular interest, how medical knowledge was (and is) translated to female readers. The way that ideas and knowledge are communicated to women, along with popular representations of the pregnant exerciser, are instructive as they facilitate an examination of power relations.

Sample

Women's magazines/journals. Similar to the medical literature, my data collection technique varied for the popular literature over time.

1900-1982: In the first several decades of the twentieth century, articles regarding exercise during pregnancy were scarce and when it was discussed it was typically in the context of general prenatal care (or 'pregnancy hygiene'). To access articles that pertained to exercise during pregnancy, I used a database called the Readers' Abstract Retrospective (RAR), which provides abstracts for articles published from 1890-1982. I used several combinations of keywords and collected and reviewed all articles that were available as well as articles from *Runner's World*, *Chatelaine* and *'Ms'* that were not picked up by my RAR search (see Appendix C for a list of articles reviewed).

Another important source of information from these early years was *Chatelaine* magazine (published 1928 – present). In examining this magazine, I follow Arnup (1994) and Mitchinson (2002) who both drew on this journal due to its high circulation numbers which suggests that it was well-read by and influential in the lives of Canadian women.[70]

[70] By the end of the first year of publication (December 1928), the magazine had a paid sales circulation slightly over 57,000. By 1950, annual circulation had reached 378,866 and by the end of the decade the number had almost doubled to 745,589 (Korinek, 2000, p. 35). Using the publisher's (Maclean Hunter) estimate of two women readers per copy, the magazine therefore had almost 1.5 million readers each issue. Korinek notes that in September 1958, *Chatelaine* purchased the subscription list of the *Canadian Home Journal* and officially became the only national Canadian women's magazine until *Canadian Living* was launched in the 1970s.

Indeed, in her book, *Roughing it in the Suburbs: Reading Chatelaine Magazine in the 1950s and 1960s,* Korinek (2000) explains that the Canadian women's journal captured many of the issues in the lives of Canadian women, also providing insight around what women were thinking as the magazine published many reader letters, providing a venue for dissent. While issues of *Chatelaine* published prior to 1987 are not available online, I was able to access earlier issues through microform.[71]

1983 to present: My search method shifted from 1982 onwards due, again, to a change in the database that I used and the increase in articles on exercise and pregnancy that were in circulation. More specifically, I searched the database Readers' Guide Abstract (which catalogues articles from 1982 onwards), using the keywords 'exercise and pregnancy.' Of the 224 articles yielded through this search method, I identified 111 articles as relevant to my project as their primary focus was exercise advice or guidelines for pregnant women. Because many of the articles that were published prior to 1995 were not available online (and therefore had to be collected manually), I decided to narrow my sample to the articles in several specific journals:

- *Vogue* and *Glamour* (beauty/women's)
- *Redbook* and *McCalls* (women's/homemaker)
- *Parents* (parenting magazine)
- *Health* and *Prevention* (health)
- *Women's Sports and Fitness* and *Runner's World* (specialized fitness magazines for the more 'serious' athlete)

[71] I examined the table of contents of every issue from 1928-1986, looking for articles specific to pregnancy or reproduction, especially prenatal care. In addition to this search of the journal index, I also examined two issues per year with an eye towards general content, style of advertising and format and made notes of my observations. Although time consuming, my detailed search of this popular women's journal provided me with a sense of the wider social context and issues of the time.

I chose to focus on these journals because they are all well-known (i.e., have high circulation numbers), all featured several articles on prenatal exercise (allowing me to examine the continuity/changes in messages) and covered a range of magazine genres (i.e., beauty, parenting, health, sport & fitness).[72] (See Appendix D for a list of journal articles collected).[73]

In addition to these women's magazines, I searched for articles specific to exercise and pregnancy in the women's fitness magazine, *Shape*.[74] *Shape* began publication in 1981 and, according to its website (www.shape.com), is currently the top selling active lifestyle magazine for women in the United States, with over five million readers a month.[75] The other women's magazine of interest was *Shape Fit Pregnancy*, a spin off of *Shape* which began publication in 1995, and which is currently the only pregnancy-specific fitness magazine circulating in North America. I was unable to access hard copies of issues prior to 2004, but using the EBSCO host (Canadian Reference Centre) database, I searched *Shape Fit Pregnancy* using the search terms: 'exercise and pregnancy,' as well as 'weight gain.'[76] I received 213 'hits' using this method, reviewed all of the article abstracts and printed off those that were specific to exercise during pregnancy (see Appendix E for a further description of the articles). In addition to this

[72] I also collected some articles in *Ladies' Home Journal*, *Harper's Bazaar*, *Better Homes and Gardens*; prenatal exercise articles were not as common in these magazines.
[73] I conducted further searches of the nine magazines identified above using the search engines Academic Search Complete and Canadian Reference Centre as I noticed Reader's Guide Abstract did not flag some articles (especially in *Runner's World*) (articles found in this search also added to Appendix D).
[74] I was unable to look through each issue but was able to conduct an online search (using CPI.Q - Canadian Periodicals database) as the bibliography is available from 1992 onwards, with full text available from 2002-present (used keyword 'pregnancy and exercise').
[75] Although *Shape* is an American publication, it is widely available in Canada.
[76] The searches of *Shape Fit Pregnancy* were conducted on June 4, 2008.

online search method, I examined ten (hard copy) issues of the magazine in order to get a better sense of the overall layout, format and style (two issues each from 2004-2008).[77]

Government literature/advice manuals. In her book, *Education for Mothers*, Arnup (1994) provides an annotated bibliography of books written for pregnant women and mothers in the first half of the twentieth century (many in the Canadian context). The majority of the books are government publications, written by 'experts' on the topic of prenatal health, childbirth and childrearing, the main one being *The Canadian Mother's Book* which later went by the title of *The Canadian Mother and Child.* There are six editions of the texts (each with several reprints) and I examined all of the editions in order to determine how the advice given changed over time, as well as to gain a better understanding of how information was provided to women. In addition to the Canadian mother's books, I examined *A Series of Nine Prenatal Letters for the Protection of Mother and Child* (1937), pamphlets published by the Division on Maternal and Child Hygiene and distributed to pregnant women and new mothers.[78] (See Appendix F).

In addition to these earlier texts, I also searched the Health Canada website and archives for more recent promotional literature and came across two resources. The first is a document entitled *Nutrition for a Healthy Pregnancy: National Guidelines for the Childbearing Years* created by the Minister of Public Works and Government Services of Canada (1999) which contains a section on physical activity. The second is a document called *The Sensible Guide to a Healthy Pregnancy* (2004) produced by the Public Health

[77] More specifically, I looked at the following issues: February/March, 2004 (Volume 10, Number 6); June/July 2004; (Volume 11, Number 2); February/March 2005 (Volume 11, Number 6); June/July 2005 (Volume 12, Number 2); February/March 2006 (Volume 12, Number 7); August/September 2006 (Volume 13, Number 3); February/March 2007 (Volume 13, Number 7); June/July 2007 (Volume 14, Number 2); April/May 2008 (Volume 15, Number 1); June/July 2008 (Volume 15, Number 2).
[78] Although Arnup examined many of these texts in her study of medical advice for mothers (between 1900-1960), she does not focus on discourse concerning exercise.

Agency of Canada which contains a section on exercise (also available online at http://www.healthycanadians.gc.ca/hp-gs/pdf/hpguide-eng.pdf). I also identified a book distributed in many local doctors' offices to pregnant women called *Healthy Beginnings* (now in its third edition). This informational booklet is published by the Society of Obstetricians and Gynecologists of Canada and has a section on exercise during pregnancy.

Popular/commercial advice manuals. I also searched the Vancouver Public Library (VPL) search catalogue using the subject terms: "Exercise for pregnant women" and "Pregnant women -- Health and hygiene." This yielded over 175 books, several of which were not specific to the topic of exercise during pregnancy. Similar to the PubMed database search, I did not look at all of the books but was interested in looking at the numbers available and when they were published. I did, however, collect and examine several books on exercise and pregnancy that were published in the 1970s and 1980s as it was during this time that women were first being encouraged to engage in more rigorous exercise (see Appendix G for the books reviewed).

Instead of examining the popular advice texts specific to exercise and pregnancy that were published in the last few decades, I examined texts that would likely be viewed by a wider selection of women, such as the various popular women's magazines and journals that I described above. With this goal in mind, I also looked at three popular contemporary advice manuals:

- *What to Expect When You're Expecting (fourth edition)* (2008); by Heidi Murkoff and Sharon Mazel.

- *The Mother of All Pregnancy Books: An All-Canadian Guide to Conception, Birth & Everything in Between* (2000); by Ann Douglas.
- *Understanding Pregnancy and Childbirth* (2004); by Sheldon Cherry & Douglas Moss.

These general advice manuals are particularly relevant because while not all women will purchase books specific to exercise and pregnancy, many purchase these general manuals. Both *What to Expect When You're Expecting* and *The Mother of All Pregnancy Books* are the top-selling American and Canadian pregnancy manuals, respectively.

Field 3: Doctor Talk

Rationale

In addition to examining print texts, I also interviewed ten physicians and one fitness trainer. The decision to supplement my document analysis with interviews was informed by Armstrong's (2003) exploration of the social construction of fetal alcohol syndrome (FAS) as a modern medical diagnosis. Armstrong traces the evolution of medical knowledge and social thought about alcohol and reproduction from the nineteenth century moral debates about drinking and heredity to the modern medical diagnosis of FAS. She argues that medical assessments of the effects of alcohol on the fetus have always been a reflection of broader social concerns – all the while being "couched in the clinical language of diagnosis" (p. 12). She complements her document analysis of the medical literature on FAS with physician interviews, explaining that:

> published medical literature is only one type of 'doctor talk'...equally important is the way doctors talk about and construct the syndrome in their offices and examining rooms, in their interactions with their professional colleagues and their encounters with the patients. (p. 107)

Rather than observing interactions between the doctors and patients, she used in-depth interviews to gather doctor's reflections on and recollections of their experiences when counseling patients about drinking and FAS, with the aim of finding out about their knowledge of FAS (i.e., what they know and how they know it), their attitudes regarding the diagnosis and their opinions of prenatal drinking as compared to other prenatal risk behaviours.

Following Armstrong (2003), I interviewed 10 medical doctors as well as one fitness instructor as a way to gain further insight into medical knowledge and practices concerning prenatal exercise. Of the sample of ten physicians, nine had what I would call a general level of medical knowledge about exercise and pregnancy (i.e., did not have any specialized training) while I classified one of the physicians as an 'expert' in exercise during pregnancy. She has written an instructional book for women on the issue, teaches fitness trainer instructor courses and provides educational seminars to other physicians. In addition, she is involved in a study focused on how to increase exercise compliance among pregnant women. The personal trainer also has specialized knowledge in the field of exercise and pregnancy as she is owner/operator of a company that runs prenatal fitness programmes for women and also teaches instructional courses on prenatal fitness for personal trainers (i.e., trains the trainers).

Although not all of my sample can be considered 'experts' in exercise and pregnancy, I view them to be important individuals to speak with as they are 'experts' in the field of health who care for and provide formal medical advice to pregnant women. They are therefore representative of what Verbrugge (2002) calls 'body experts' more generally - individuals who disseminate and apply knowledge about the body. Through

the use of interview methodology, I examined their knowledge about and attitudes toward prenatal exercise, and more specifically, their ideas about 'risk' and exercise during pregnancy. I also attempted to learn more about their interactions with their patients or clients (e.g., whether they promote exercise to their patients/clients, the type of exercise practices they recommend). A central aim of these interviews was to examine how these physicians translated medical knowledge to women and by extension, some of the types of messages pregnant women are exposed to in their direct interactions with health professionals.

Recruitment and Sample

Rubin & Rubin (1995) suggest that the optimal recruitment strategy is to find knowledgeable informants, obtain a range of views and then test emerging themes with new interviewees. Following this suggestion, my initial recruitment strategy was purposive sampling so as to maximize sample diversity. I first identified medical doctors working in the Vancouver area by using the 'find a physician' search engine on the College of Physicians and Surgeons of British Columbia website (https://www.cpsbc.ca/). This search engine allowed me to not only identify physicians working in the Vancouver area but to also identity their specialty area such as family practice or obstetrics and gynecology (Ob/Gyn), gender, years practicing medicine as well as their office address.

I attempted to select a sample that varied by gender and years practicing. Due to the gendered nature of my research (and the political struggles associated with the reproductive female body), I felt that it was important to recruit both male and female doctors to gain the perspectives of both sexes. This is a similar recruitment protocol as that used by Gott et al. (2003) in their examination of practitioner's attitudes to discussing

sexual health issues with older people. Moreover, I tried to assemble a sample from a variety of age groups so that I could speak to doctors who attended medical school at different times (on the assumption that they may have different understandings of prenatal exercise). By having a diverse sample of participants I hoped to gain a better understanding of the way that doctors (as professional groups) might view the issue of prenatal exercise, at the same time understanding that I am unable to make broad generalizations based on my findings (due to the qualitative nature of the research).

For my first contact effort (mid-October 2007) I sent interview request letters to approximately 30 general/family practice physicians and 90 Ob/Gyns (see Appendix H for sample of letter). The response rate was less than 5%. Given this low rate of response, I altered my recruitment procedure slightly, electing to use snowball sampling where possible, although this only garnered two additional interviews. In mid-December 2007 I followed up with another recruitment effort, mailing out about 45 letters to general and family practitioners. I obtained one additional interview from this effort. The following table captures the basic characteristics of my sample of physicians:

Table 1: Biographical Data – Physicians

Participant	**Gender**	**Specialty**	**Years Practicing as of 2008**	**Country of Medical Training**
SJ	F	Family Practice	12 years (1996)	Canada
KN	F	General Practice	19 years (1989)	Canada
RB	M	General Practice	26 years (1982)	Canada
KG	F	General Practice	30 years (1978)	US
DE	M	Family Practice	34 years (1974)	Canada
SS	M	Family Practice	35 years (1973)	Canada
HR	M	General Practice	37 years (1971)	UK
DM	F	Ob-Gyn	25 years (1983)	Canada
GM	M	Ob-Gyn	33 years (1975)	Canada
GU	M	Ob-Gyn	39 years (1969)	Canada

The final sample consisted of seven family practice or general practice physicians and three Ob/Gyns. Six of the participants were male and four female, and the physicians involved had between 12 and 39 years of experience. Although the sample of doctors was small, the interviews were not intended to be representative of the state of knowledge regarding exercise during pregnancy within the medical profession but rather to supplement my larger document analysis. As stated previously, in order more fully attend to (and untangle) the various 'ways of knowing' about exercise, I examined several 'fields' or sites of communication. The physician interviews were therefore intended to add another layer to my analysis, facilitating a preliminary examination of how (or if) medical professionals make use of scientific literature on the topic, and providing further insight into the complex array of ideas in circulation.

Also included in my sample was a fitness trainer who specializes in working with pregnant women. She runs her own pre- and post-pregnancy exercise business which has several franchises throughout the lower mainland of Vancouver. In addition to being an owner/operator of this business she also runs instructor training classes in prenatal exercise.[79] Given her background, I considered this participant to be an 'expert' interview and as such I did not interview any other fitness trainers, deciding that because she 'trains the trainers' about exercise during pregnancy she could inform me about the standard of care/knowledge base required for the trainers. I recruited this participant when I identified

[79] She has been a British Columbia Recreation and Parks Association (BCRPA) registered group fitness instructor since 1991. She indicated that she became interested in exercise during pregnancy in the late 1990s but there was little information available until 2002 when Can-Fit-Pro held a certification course on exercise during pregnancy. After obtaining this National Pre and Postnatal Fitness Certification, she founded her business in Vancouver. In 2006, the business franchised and there are now ten communities in Western Canada that offer the programmes.

her business on the internet. I sent her a letter of introduction to which she immediately responded.

Interview Schedule

I used a semi-structured interview guide, which allows for the exploration of specific ideas as the researcher introduces the topic and then guides the discussion with focused questions (Rubin & Rubin, 1995). A slightly different interview guide was used for the medical doctors and the fitness instructor (see Appendix I1 & I2). Although I provided the general structure of the interview, it was also somewhat unstructured in the sense that I allowed the interviewee to pursue certain lines of thought, following up with probes for further detail, examples and context where desired. Moreover, and following Rubin & Rubin (1995), I favoured an interview design that was flexible, iterative and continuous (as opposed to being 'locked in stone') and early on in the interview process I adjusted the design of the interview as better ways to study the questions emerged. I also created new questions to examine themes and ideas which emerged from the data which required me to analyze the data as I proceeded in the interview process. I ended the interview process when I decided that each additional interview was adding little in the way of new ideas or information.

Interview Procedure

My initial aim was to interview the physicians (and fitness trainer) for about 45 minutes (a relatively short amount of time for qualitative interviewing) as the participants are busy professionals – and the interviews were typically conducted during work hours. While I was able to speak with about half of the physicians for 45 minutes, I had to keep some of the interviews to 30 minutes given their busy schedules. Eight of the physician

interviews took place at their workplace, one interview was conducted by telephone and one was conducted in a quiet restaurant. The interview with the fitness instructor took place via telephone. The interviews had previously been approved by the UBC Behavioural Research Ethics Board (see Appendix J for a copy of the Certificate of Approval) and all interviews were preceded with an introduction to the study, overview of the consent form (see Appendix K) and an opportunity for the participant to ask questions or voice concerns (telephone interviewees faxed me the consent form following the interview). Interviews were tape-recorded and transcribed immediately following the interview into a *Word* document.

Analysis of Data

As mentioned previously in the chapter, there is no 'recipe' for analyzing data using a Foucauldian approach. Foucault elaborated on his methodological tools in several texts (see for example *Archaeology of Knowledge* (2002), *The History of Sexuality, Volume 1* (1990); *Questions of Method* (2003c); *Nietzsche, Genealogy, History* (2003b)) and I draw upon these texts for guidance in my analysis. However, aside from *Archaeology of Knowledge* (2002) in which Foucault elaborates on the four levels of discursive structures which can be used to help structure an analysis of these structures, his writings on methodology provide more of a conceptual framework than a method per se, or in other words, a way of 'reading' texts as opposed to clear cut steps for analysis. Several scholars have usefully elaborated on and further developed Foucauldian strategies of analysis and their work has informed my own (Carabine, 2001; Kendall & Wickham, 1999; Liao & Markula, in press; Markula & Pringle, 2006).

While acknowledging that I am not an impartial observer as I deconstruct (and reconstruct) the 'truth games' surrounding pregnancy and exercise, I should note that a Foucauldian analysis does encourage a level of self-reflexivity from researchers. To be sure, the very purpose of conducting a 'history of the present' is to disturb what is taken-for-granted – including our own assumptions about what we might find, for these assumptions are representative of our own ideological positions and intertwined in the complex relations of power (Kendall & Wickham, 1999). In their book, *Using Foucault's Methods*, Kendall and Wickham (1999) identify a strategy that can be used to help the researcher conduct a 'history of the present,' namely looking for *contingencies* instead of *causes.* This entails looking for strangeness in all social relationships instead of cause and effect patterns. By looking for contingencies, we see that there is nothing necessary about the relationship between two events - in other words, they did not necessarily have to be this way. This helps to guard against ideas of false progressivism (e.g., that current exercise guidelines are now more objective than they were in the late nineteenth century and are therefore no longer embedded in a complex network of power relations) as well as imposing one's own position on the analysis. Indeed, when conducting an archaeological analysis, the aim is to examine discursive structures to help us understand how we come to think about things in a certain way which does not necessitate a judgment of whether the discourse is 'good' or 'bad.' Where a level of judgment likely does creep in (at least in my work) is when we examine how a discourse is being *used* in the operation of power (Liao & Markula, in press).

In what follows I provide a general overview of my 'research plan' for an archaeological and genealogical analysis (i.e., the questions I asked and the approach that

I took when examining my data). I should note that while I present the methodologies as two distinct phases of research, when I share the findings in my results chapters, they are presented as one. As Markula & Pringle (2006) explain in their outline of how to use Foucault's methodology, "considering that Foucault referred to his methodology singularly as genealogy in his later works, such clear separation is not necessary" (p. 70). I then provide a brief discussion of the 'nuts and bolts' of how I analyzed the data.

Research Plan for an Archaeological Analysis

In the *Archaeology of Knowledge* (2002) and also in a later essay "On the Archaeology of the Sciences" (1998), Foucault problematized historian's reliance on conventional 'unities' (a concept or object constructed through language systems) to understand history. Such unities, he asserted, support 'continuities' and therefore obscure the existence of 'discontinuities' or changes in ways of thinking or epistemes.[80] His interest, as mentioned previously, was in analyzing the set of rules (the 'archive') that, at a certain time, a culture uses to shape the episteme or the way of viewing the world that allows for some things to be accepted as knowledge and others rejected. He therefore introduced the 'discursive formation' which "groups together a whole population of statement-events" in a manner that does not "coincide with the immediate and visible unities into which statements are conventionally grouped" (p. 321). He suggested that by closely examining (excavating) the four components which govern discursive formations (objects, enunciation, concepts and theoretical formations), the historian of ideas could better understand the power relations involved in the production of knowledge through

[80] Foucault (1998, p. 307-8) was interested in pursuing discontinuities in order to restore to statements their status as events; that is, to examine how a statement (or event) relates to other events in a contingent manner instead of a direct cause and effect relationship (i.e., examine system of dispersions) (see also Foucault, 2003c). His goal was to construct new unities in a regulated manner, thus excavating the archive (those sets of rules that determine the way a culture views the world) and ruptures in the episteme.

certain discursive practices.[81] While Foucault did not clearly link the formation of discourses with relations of power in his archaeological analyses, it was in his genealogical analyses that he further examined how the discourses are put to use in the operation of power (more specifically by linking the individual statements to the 'general domain of all statements' or the wider social context).

The text in which Foucault articulated his understanding of discursive formations, *Archaeology of Knowledge* (2002), has been critiqued for being obtuse and difficult to understand (Dilger, 1999) and Markula and Pringle (2006) note that to their knowledge, sociologists of sport and fitness have not explicitly used this methodology in their research. In order to address this absence (and to provide a template for other researchers), Markula and Pringle (2006) work through the four components of a discursive formation outlined by Foucault in *Archaeology of Knowledge*.[82] They elaborate on each of the four components, describing how they used them to examine the discursive formation of 'fitness' in Western society (i.e., the development of Western understandings of 'fitness'). It is worth relating their approach in some detail.

The first step was to identify the *objects* or the specific topics around which knowledge about fitness accumulated, in their case, the body, health and movement. They then examined the *enunciations* – or how the objects are talked about, where the statements are found, and what types of statements exist around a particular knowledge. This step is relatively straightforward as one decides which texts or practices to examine

[81] As he explained, the analyst could "bring to light relations between the phenomena of enunciation which had hitherto remained in darkness and were not immediately transcribed on the surface of discourses" (p. 321). He was careful to caution against subscribing to a Marxist notion of false consciousness, however, explaining that "what it brings to light is not a secret, the unity of a hidden meaning, nor a general and unique form. It is a controlled system of differences and dispersions" (1998, p. 321).
[82] See also Liao & Markula (in press) for an examination of the discursive formation of women's sports.

and identifies what is being said and/or done. Markula and Pringle focused on scientific enunciations of the fit body (although they could have focused on popular culture fitness enunciations). The third step entailed an examination of the *concepts* developed in these enunciations and how they are organized. The aim of this step is to identify how concepts form an individualizable group of statements (or a group relation) that share certain rules of formation which determine what can be said or done. In their example, Markula and Pringle determined that the field of science and the field of fitness both privilege objective scientific research as the dominant 'way of knowing.' With this insight they suggested that the concept linking science and fitness is 'health' because "the most widely accepted justification for promoting fitness is its predicted health benefits" (p. 56). Finally, they examined the *theories* or *theoretical formations* that evolve from the concepts. These inform what counts as knowledge about fitness and, ultimately, inform exercise prescriptions and bodily practices.

Thus, in my own examination, the objects that I focus on are (quite obviously) the pregnant body, the fetus and physical activity/exercise and (as explained above) the three fields that I examine for relevant statements are science/medicine, popular culture and 'doctor talk.' When examining the various texts, I tried to identify the rules that shaped the concepts that arose. For instance, viewed through the 'rules' of nineteenth century medicine, a central concept linking pregnancy and exercise was 'danger' - although 'health/hygiene' also emerged. Finally, I examined the theoretical formations (typically exercise prescriptions) that arose from these concepts.

Explaining that the identification of the 'rules of discourse' is central to conducting an archaeological analysis, Kendall and Wickham (1999, p. 42) share four

steps to help the researcher do so. These steps also guided my analysis. The first step is the identification of the rules of the production of statements. This necessitates identifying shifts in ways of thinking about a concept or idea, such as the shift in thinking that occurred with respect to sexuality in the eighteenth century. Or more specific to my project, one would identify the shift in ways of thinking about exercise during pregnancy that occurred in the late 1960s. This step also entails thinking about the rules of production of different statements. The second step is the identification of rules that delimit the sayable (which are never rules of closure) and the third is the identification of rules that create the spaces in which new statements can be made. Kendall and Wickham note that the second and third steps cover similar ground as the first: in identifying the rules by which statements are produced, the researcher is, in a sense, identifying the rules that delimit the sayable and the rules by which new statements are made. The fourth step is the identification of rules that ensure that a practice is both material and discursive at the same time. Thus, the researcher examines how knowledge does not consist of just thoughts and ideas but must also be understood as material practices (i.e., there are theories of fitness and health as well as fitness gym where theories are disseminated, shaping bodies). Kendall and Wickham also outline seven things that archaeological research (in action) attempts to accomplish and I also used these points to guide my research efforts (see Appendix L).

Research Plan for a Genealogical Analysis

While the tools of archaeology require some elaboration, the tools of genealogical analysis are more succinct as the aim is to examine how the discourses identified in an archaeological analysis are put to use (Liao & Markula, in press). For my genealogical

analysis, I draw upon the various forms of power that I discussed in the review of literature: disciplinary power (the target of which is the individual body and which functions through normalizing judgments, hierarchical observation, examinations); biopolitics of population (statistics, epidemiology) and governmentality. I then examined how the discourses of exercise and pregnancy might subject individual women to these power relations. For instance, how do exercise prescriptions function as a form of disciplinary power, imposing norms and instilling women with the need to engage in self surveillance? How are statements around exercise and pregnancy put to practice in the regulation of the health of the population – a form of biopower? I also use governmentality as an analytical tool for examining the link between political rationalities and the practice or strategies put into place to solve a problem. This entails starting from problematizations. Thus, instead of starting with the question 'how does medicine regulate women's bodies?' the researcher first asks 'how does a particular problem – maternal mortality for instance – come to emerge as a target for government and what role is played by various institutions in this?' (see Rose & Valverde, 1998). The overarching goal of my genealogical analysis is to connect the discourse of exercise and pregnancy (over the past century) with the power relations that define motherhood and prenatal care in Western society more generally.

Practical Steps

My examination of data (and presentation of results) varied slightly throughout the dissertation. In the first three chapters I trace changing medical ideas regarding pregnancy and exercise from the late nineteenth century to the early twenty-first century. For this portion of my analysis I read through the texts and articles (scientific and

popular) that I identified through my data collection, examining them with an eye towards how prenatal exercise advice did not occur in isolation but was linked to a whole series of complex relations between other events (i.e., the contingency of the advice). This required me to read over and record what was said about exercise and pregnancy, attending all the time to the wider social context in which it occurred. I was careful to note (and point out) what Seale has termed 'negative examples' (exceptions to the rule or 'normal' advice). I also took note of interesting trends in what was being said and attended to 'ruptures' in the episteme or points of discontinuity in knowledge. As I read the data I also attended to the key points and questions discussed above (see Appendix M for further explanation of data analysis).

My analysis of the contemporary popular literature (presented in Chapter Seven) and physician interviews (presented in Chapter Eight) was also underpinned by the analytical techniques of archaeology and genealogy but the process of analysis differed slightly from the first three results chapters due to temporal differences in the data. Instead of looking at a vast array of texts spanning a wide range of time, in the latter two results chapters I examine data specific to a certain context. As such, I reviewed the texts of interest (which were fewer in number than in the first three chapters), identified key concepts/themes and discussed these in more detail. Analysis of the data followed Rubin & Rubin's (1995) approach, which entails reading and re-reading texts or transcripts, noting central concepts or ideas that emerged, coding the data and grouping the codes into categories that bring together similar ideas and concepts. Once a set of connected themes had been identified the texts and transcripts were (re)examined for confirming (or disconfirming) evidence to ensure the links made were actually grounded in the data.

CHAPTER FOUR

Building a Healthy Nation-State: Professional Power, Prenatal Care and Patriotic Motherhood

In this chapter I examine the production of medical knowledge about exercise during pregnancy from the early twentieth century until the years following the Second World War (the late 1940s/early 1950s). My aim is to 'excavate' the 'rules of formation' that helped to produce and regulate what was to be accepted as knowledge about the female (reproductive) body, and ultimately, shaped the exercise prescriptions given to pregnant women. This entails examining the wider social conditions that influenced the ways of thinking about and understanding the pregnant body, delimiting what was 'sayable' about its physical capabilities. In doing so I aim to illustrate the contingent nature of the advice provided – that what was accepted as fact or truth could have been otherwise. A central focus of the chapter is how/if the prenatal movement that emerged in the first decades of the twentieth century - and began to shift the meanings and social practices surrounding the pregnant body and care of the pregnant body - influenced medical ideas regarding appropriate physical activity and exercise practices for women.

While the first several decades of the twentieth century are the primary focus in this chapter, I begin with a discussion of the production of medical knowledge about exercise and the female (reproductive) body in the late nineteenth century. Many of the ideas concerning exercise and pregnancy circulating in the first half of the twentieth century (and still today) were rooted in medical writings and ways of thinking characteristic of earlier decades. Following the discussion of late nineteenth century medical literature, I examine the rise of the prenatal movement in some detail. While this may seem to be a deviation from my focus on prenatal exercise, the rise of prenatal care

laid the foundation for new ways of thinking about pregnancy and childbirth, and more specifically the relationship between physicians, women and the fetus – and the place of all three in the governmental complex. With this background I then examine the prenatal exercise advice (which fell under the rubric of 'pregnancy hygiene advice') that emerged during this time from within the traditional medical profession (i.e., the mainstream medical and health promotion organizations in Canada – as well as the United States and Britain). I conclude with a discussion of a central concept that emerged from the medical statements and enunciations on pregnancy, the female body and exercise – that of 'danger' – and place prenatal exercise into the larger governmental complex of the time, suggesting that it oscillated between being viewed as a problem *and* a solution to the health of the mother, child and nation-state, albeit with emphasis on the former.

The Female Body and Exercise Advice in the Late Nineteenth Century

In late nineteenth century Britain and North America, the reproductive health of middle class Caucasian women was an important social issue. Feminist historians have illustrated how, during this time, there was concern about the health and fitness of the population, and in particular, the reproduction of a strong White, imperial nation-state (Arnup, 1994; Hall, 2002; Lupton, 1995; Oakley, 1984; Thomson, 2001). Fears of race suicide were fuelled by a decrease in birth rate (especially amongst the middle and upper classes), the 'pollution of the race' through infectious diseases such as tuberculosis and venereal diseases (Hall, 2002) and the emergence of the 'new woman' who was perceived to threaten the sanctity of nineteenth century gender roles which constructed women as the 'moral guardians' of the race (Kline, 2001). It was in this context that women's reproductive health became a special object of medical interest.

The medical profession, which had grown in status during the latter half of the nineteenth century as it was legitimized and institutionalized through the creation of formal medical associations and training programmes, assumed the position of 'experts' in women's health (Arney, 1982; Mitchinson, 1991).[83] Indeed, it was during this time that childbirth increasingly came under the purview of the (male) medical profession. While midwifery did not completely disappear in Canada (but rather took on an 'alegal' status) (Biggs, 2004) and remained a legitimate (legalized) birthing option in Britain and the United States (albeit not self-regulating and under constant scrutiny from members of rival professions) (Arney, 1982), regular medicine and obstetrics entered the first part of the twentieth century with a firm hold on the management of birth. It is important to note that British obstetrics was more securely established as a legitimate profession compared to its North American counterparts (Arney, 1982). Within the Canadian context, Mitchinson (2000) explains that while science, especially the medical technique of surgery, was growing in status during the first decades of the twentieth century, obstetrics was not a 'high status' occupation. It was not until the late 1930s that it became a respected specialty area – its increased status due, in part, to the introduction of surgical techniques in obstetrics. Thus, as childbirth became increasingly medicalized (and pathologized), the practice of obstetrics grew in importance within the medical community.

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[83] The ascendancy of the medical profession as *the* health authority in the latter half of the nineteenth century was especially pronounced in North America as it was during this time that medical organizations (such as the American Medical Association and the Canadian Medical Association) received licensing privileges. As compared to the organizational model in Britain (where medical practice had been under the direction of the Royal College of Physicians since 1518), North America had previously followed a 'free market' or competitive model in which anyone who possessed some knowledge of (or showed a talent for) medicine could practice (Arney, 1982; Mitchinson, 1991).

The development of the profession of obstetrics aside, a central role taken on by the ascendant medical profession, more generally, was the dissemination of advice to help young women grow into healthy wives who produced robust children and in turn, nurtured a healthy nation (Chavasse, 1879; see also Arney, 1982; Mitchinson, 1991; Vertinsky, 1994).[84] Significantly, much of this advice reinforced dominant ideas about what constituted proper social roles and behavior for women. Vertinsky (1994), for instance, explains that "late nineteenth-century physicians were among the first of the new experts to claim a scientific foundation for the medical pronouncements upon how women should look and behave and what they were capable of doing physically" (p. 7). Similarly, in her discussion of medicine in Victorian Canada, Mitchinson (1991) illustrates how medical doctors (often male) used their growing professional status to 'prescribe' behaviour deemed to be appropriate for women, often reinforcing the ideology of separate spheres.

While the female body had been viewed as unstable and diseased since Hippocratic medicine where the womb was seen to be susceptible to contamination and a source of disease (wandering through the body and causing hysteria) (Kukla, 2005), Mitchinson (1991) explains that "what occurred in the late nineteenth century was an intensification of the notion of woman's vulnerability to illness because of the very nature of her body" (p. 49). The medical profession assumed that women were more susceptible to illness and disease than men, and thus in need of advice and guidance on how to ensure their (reproductive) health. Many of the anxieties about women's health stemmed from

[84] For instance, many of the guides for women's health published during this time (targeted at upper and middle classes) opened with a preface on women's role in life as moral guardians of the race, lamented the ill health of women which was perceived to lead to barrenness and offered detailed remedies for both prevention and cure (see for instance, Chavasse, 1879; Napheys, 1871).

concern about the ill effects of modern life which encouraged a sedentary existence, over-stimulating food, late nights out, the reading of risqué novels and other moral ills. According to Mitchinson (1991), physicians' focus on civilization and modern life as an underlying cause of women's disease was a consequence of an increasingly industrialized and urbanized society in which areas previously perceived to be separate and self-contained – family, work, home, education, health – were obviously overlapping. She suggests that "in certain respects this benefited physicians...women could not avoid civilization and, in order to cope with the physical repercussion on their bodies, they would have to look to the medical profession" (p. 75).

During this time popular medical opinion held the view that the body constituted a discrete energy field that contained a specific and limited amount of vital energy (Lenskyj, 1983; Vertinsky, 1994). This theory, termed Vital Energy Theory (VET), postulated that if used up in one area, energy would be unavailable in another. Menstruation and reproduction were seen to require an extra allotment of energy such that reproductive needs left little for women's intellectual development. Vertinsky (1994) explains that menstrual function was not fully understood at this time, for although physicians had connected menstruation with ovarian function in the early nineteenth century (prompted by the discovery of the ovum), the timing and triggering of menstruation was largely misunderstood until early in the following century.[85] Numerous theories were put forth, however, all sharing the belief that females were driven by (and

[85] There was little understanding of menstrual function until after 1900 when discoveries about the role of hormones in the menstrual cycle allowed for a better understanding of the cycle of changes in the endometrium (and the continual building up and breaking down of the lining) and the role of ovarian hormones in triggering the cycle (Vertinsky, 1994). Lenskyj (1983) suggests that VET continued into the twentieth century, despite mounting evidence against it and new knowledge about the workings of the female body.

at the mercy of) the tidal currents of their reproductive cycles, and further, that menstruation was a trauma that occurred each month, "a morbid and unnatural activity, a disease that required specific therapies" (p. 45).

Physical exercise was thought to contribute to the regulation of the body's energy supply and 'normal' development – if it was conducted according to proper medical prescription. Through her detailed examination of late nineteenth century medical discourses, Vertinsky (1988; 1994) sheds light on the rules of formation that helped to shape the exercise prescriptions given to women. She illustrates how they were grounded in the science of the day and informed by longstanding notions of proper gender roles, part of the governmental apparatus that served to discipline the female body with the aim of (re)producing a healthy nation-state. Prescriptions for appropriate exercise were given for all stages of life: childhood and pre-adolescence, the childbearing age of 15-45, and middle- or old age (woman over 45) (Vertinsky, 1988). The years in which the menstrual cycle was established were thought to be of critical importance, laying the foundation for women's future (reproductive) health. Thus, while little girls were often encouraged to play outdoors and engage in athletics and sports, at the first sign of puberty they were advised to rest. Mental or nervous strain (caused by education) was to be avoided, along with violent physical activity (especially during the menstrual period) lest it drain young girls of their crucial and limited energy sources, rendering them infertile.[86]

[86] Exercise was not to be altogether avoided: regulated (moderate) exercise such as gymnastics or light walks were advocated as a way to build a girl's strength in preparation for motherhood. However, many physicians cautioned against exertion during the menstrual period and competitive sporting activities and excessive physical exertion were typically discouraged at all times of the month (these were viewed as masculine activities). A fine balance was required, necessitating doctor's advice and guidance.

The need for women to monitor their activities according to physicians' advice did not end with the onset of menstruation. Rather, ongoing menstruation and additional maternal functions (such as pregnancy, childbirth, mothering and maintaining the home) required precious vital energy from women's limited stores. From the time of puberty and onwards, therefore, middle class women were viewed as invalids, lacking the stamina and strength for sustained physical and mental effort as they were required to channel their energy into their 'natural' role of wives and mothers. In short, a woman was taught that she must comply with a medical regimen that began at puberty in order to avoid the constant threat of disease and nervous disorder and "ensure the smooth functioning of her reproductive organs and the careful expenditure of scarce energy" (Vertinsky, 1994, p. 70).

Pregnant women were also the object of medical advice concerning appropriate exercise practices. In fact, upper and middle class women (the intended audience of the advice manuals) were thought to require a modicum of exercise in order to prepare for birth. This notion of 'training for childbirth' was a new way of thinking about the (upper class) pregnant body for prior to the turn of the century, Victorian women were advised to keep themselves hidden while pregnant lest their unsightly, messy bodies offend others (Blankenstein, 1967; Rankin, 2002). In several medical texts and advice manuals published in the final years of the nineteenth century, pregnant women were cautioned by doctors to resist a sedentary or 'indolent' lifestyle of luxury (with excess of food and entertainment) and were encouraged to train for labour as it would lead to an easier birth. The texts pointed to the quick and painless childbirth experiences of poor women, 'negro' women and women from "wild native tribes" who were able to "resume their occupation

the day following without inconvenience" (Kellogg, 1901, p. 411; see also Chavasse, 1879; "Ladies' Book," 1896; Stockham, 1893).[87] Kellogg (1901) asserted that:

> it is chiefly among the middle and higher classes of society that the pains of childbirth are felt and the dangers of maternity experienced. This fact is almost conclusive evidence that the habits of luxury and idleness which are so common among the women of these classes are the chief causes of making a process which is naturally attended by little suffering and danger, so extremely painful and hazardous that it is looked forward to with indescribable dread and avoided by every possible means. (p. 411)

The advice reflects deep class, racial and gender biases characteristic of the time. The assumption that the 'lower classes' and 'savage women' had easier births likely reflected the widely held impression that they were multiplying at an excessive rate – and that these women were less delicate, 'civilized' and human than women of the higher classes. By living a less indolent and luxurious lifestyle, it was thought that birth could be made easier for middle and upper class women, suggesting that advice to train for childbirth was in large part meant to encourage these women to reproduce – preventing race suicide and preserving the health of the nation state. It also functioned as social commentary, a critique of the "habits of luxury and idleness" which were thought to be common among women of the higher classes and which were viewed as threatening the very moral fibre of society.

While physical activity was encouraged, appropriate exercise for middle and upper class women included easy walking, simple calisthenics or light housework - and was never to be taken to the extreme (Chavasse, 1879; Kellogg, 1901; "Ladies' Book,"

[87] In *Preparation for Motherhood*, Scovil (1896) explains that women especially need to train the muscles involved in expelling the child from the uterus and in her popular text *Tokology*, Stockham suggested that women need to develop their trunk, abdomen and groin muscles. Both authors provided detailed (and moderate) exercises/drills for women to conduct. In the texts that I reviewed, it was the manuals authored by females that provided detailed accounts of particular exercises; the male authors of the advice manuals spoke in vague terms, focusing mostly on activities to avoid.

1896; Scovil, 1896).[88] Pregnant women were warned of the dangers of prolonged standing or sitting (especially when bent over a writing table) (Scovil, 1896, p. 116) and strongly cautioned to avoid "stooping, lifting heavy weights, and overreaching...running, horse-exercise, and dancing" as these activities were thought to frequently induce a miscarriage (Chavasse, 1879, p. 127). While walking was often promoted as an excellent form of exercise for pregnant women, allowing exposure to open air and sunshine (see Napheys, 1871; Stockham, 1893), even this activity was viewed as potentially dangerous if overdone, especially during a woman's first pregnancy. Chavasse (1879) explains that "too long walks" are "a common cause of *flooding*, of *miscarriage*, and of *bearing-down* of the *womb*" and that "as soon, therefore as a lady has the *slightest suspicion* that she is *enceinte*, she must be careful in the taking of exercise" (p. 127, emphasis in original). In some of the advice manuals it was asserted that moderate exercise was to be complemented by periods of rest and relaxation throughout the day, as well as a good night's sleep (Scovil, 1896; Stockham, 1893). This was not always the case, however. In *Advice to a Wife*, Chavasse (1879) was so averse to the sedentary lifestyle of wealthier women that he advised "the only time for them to lie down is, occasionally in the day – when they are really tired, and when they absolutely need the refreshment of rest" (p. 128).

The literature published in the manuals directed at women typically did not provide a discussion of the physiology behind the advice to avoid vigorous or violent

[88] Vertinsky (1994) notes that housework was often positioned as the "healthiest occupation" for a pregnant woman (aside from the lack of fresh air), reflecting the ideological underpinnings of the doctor's advice. Stockham (1893), for instance, explained "general housework is desirable" as it brings nearly all the muscles of the body into action and moreover, should be especially satisfying to the pregnant woman as she is "nestbuilding" and the "home work is a labour of love" (p. 138). However, more laborious household chores such as washing, scrubbing, and heavy lifting were to be avoided and indeed, exercise in general was never to be taken to the point of fatigue.

activities, though some physicians writing in medical texts did attempt to provide a scientific rationale for this common prescription. In his text, *Manual of Obstetrics, Gynecology and Pediatrics* (1889), Kenneth Fenwick, a professor of obstetrics and gynecology at Queen's University in Ontario, explained that any activity or behavior that led to the contraction of the uterine fibers (and in turn the premature expulsion of the ovum) caused abortion or miscarriage. He differentiated between 'exciting' and 'predisposing' causes of uterine contraction. The former were described as anything that directly or indirectly excited the uterus to contract and expel its contents, such as fright, anxiety, falls, sudden shock, accidents, old peritoneal adhesions and displacements of the uterus (especially retroversion or flexion). Predisposing causes were "all those circumstances that increase the susceptibility or irritability of the cerebro-spinal nervous system" (p. 34)[89] which would in turn excite the uterus to contract and included excessive indulgence in the pleasure of society, overheated and ill-ventilated rooms, alcoholic indulgence, over-frequent sexual intercourse, fevers, bronchitis, pneumonia and syphilis. Stockham (1893) further differentiated between exciting and predisposing causes of miscarriage and suggested that predisposing (she called them 'remote') causes included tight, heavy clothing and insufficient exercise as these factors created a lack of room in the pelvis and abdomen. She also pointed to too much time indoors, overheated rooms and "violation of the laws of sexual congress" (p. 244) as remote causes, suggesting that these activities "diverts from its needed purpose the mother's energies, and weakens embryonic life" (p. 244). Stockham's advice appears to have been informed by Vital

[89] Fenwick viewed uterine contraction as controlled by nervous stimulation as opposed to hormones, suggesting that his understandings of the body were underpinned by VET.

Energy Theory, as she viewed certain activities as draining the woman's system of its vital energy, drawing it away from the developing fetus:

> the woman who indulges in the excessive gayety of fashionable life, as well as the overworked woman, deprives her child of vitality...If abortion is not the result, can any sane woman expect her child under such circumstances to be in possession of vigor and strength? Bounding health is the inheritance of childhood. Woe to the parent who robs it of this inheritance! (p. 93)

It appears, then, that exciting causes were thought to be directly responsible for miscarriage while predisposing causes were more akin to 'risk factors' and related to lifestyle activities that increased the chance of miscarriage. Interestingly, the word 'risk' was rarely used in the health literature during this time, becoming more common in the 1950s with the rise of epidemiology and risk calculation (Susser & Susser, 1996). A review of the literature provides evidence to suggest that exactly what might constitute 'exciting' and 'predisposing' causes was open to a wide variety of interpretations, allowing for spurious connections to be made regarding the cause of miscarriage. Indeed, the persistence of Vital Energy Theory informed the popular viewpoint that certain lifestyle activities (excessive gayety, overwork, too much alcohol, excessive indulgence) would divert vital energy from the fetus and cause a miscarriage or, if the baby was carried to term, a weakened child. Thus, the 'accepted' knowledge about the pregnant body (in turn rooted in fears about race suicide and the faltering moral ethos of the time) led to advice that acted as prescriptions for appropriate behavior and emotions, illustrating the contingent nature of the advice – that is, that it could have been otherwise.

While most of the exercise advice focused on how to prevent miscarriage (by limiting leisure and social activities, as well as undue emotional strains), there was some evidence of the 'fit for two' discourse in this early literature, more specifically the

concern that women receive plenty of fresh air during pregnancy as they are 'breathing for two.' As Scovil (1896) explained, the pregnant woman must ensure that she inhales enough oxygen to purify the blood of the child, as well as her own (p. 112). Scovil (1896) and Stockham (1893) both prescribed moderate exercises for the expectant mother so that she might improve respiration by developing muscles diminished by years of wearing corsets and other constrictive (fashionable) clothing. Stockham, in particular, was an advocate of women's rights, speaking out in favour of dress reform and birth control. In this context, her exercise advice took on a political tone, as it was constructed as a practice to mitigate the sartorial constraints imposed upon women by a patriarchal society. At the same time (and paradoxically), her advice at times infantilized women. She stated, for instance, that the pregnant woman is "no judge of her physical strength" and that the "prudent, watchful husband and loving friends must be her guardians" admonishing her not to over-exert herself lest she inflict great injury upon herself and her offspring (p. 92). Jefferis and Nichols (1894) also advised pregnant women on the importance of proper respiration and the need to wear loose clothing as tight dresses were thought to cause disease and produce "frailty and malformation of offspring" (p. 308).[90] While their advice might also be read as advocating women's emancipation, Jefferis and Nichols appeared to place more emphasis on the danger that corsets would impede a woman's reproductive capacities, preventing her from fulfilling her 'natural' role in life. A complex mix of messages about womanhood was therefore in evidence as statements

[90] Jefferis and Nichols suggested that tight lacing and corsets were a significant cause of infantile mortality, as well as "displacement of the womb, interior irritation and inflammation, miscarriage and sterility" (p. 311).

around dress reform and women's emancipation co-mingled with the view that motherhood is a woman's essential role in life.[91]

Kukla (2005) explains that the notion that the pregnant woman was 'living for two' was not new in the nineteenth century. It had already been disseminated in seventeenth century obstetrical and midwifery texts (in the form of the Theory of Maternal Imagination which held that cravings, thoughts and desires - especially those arousing immoderate passions - would mark the infant).[92] Kukla asserts that what *did* change over the centuries was the perceived *extent* of the mother's control over the fetus. She describes how, in the seventeenth century, there was little understanding of pregnancy as dissections of the pregnant body and thorough physical exams of women's bodies were rare due to fears of indecency. The female reproductive organs tended to be seen as unstable, shifting throughout the body and the womb particularly susceptible to corruption. The fetus was often described as fragile, ill protected and living in the dangerous space of the mother's womb, at risk of being 'corrupted' by pregnant women's behaviours. However, because it was believed that the fetus was already in miniature adult form and simply grew larger throughout pregnancy, woman's role was simply to avoid creating monstrosities and deformities (and avoid fetal death), not to enhance maternal outcomes. In the eighteenth century, however, the 'discovery' that fetal

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[91] While this may seem somewhat contradictory when viewed through a lens of modern day (liberal) feminism, it was very much in line with the ideology of late nineteenth century maternal feminism which acknowledged women's special maternal role and wished to expand it beyond the private realm to the public sphere, working to achieve reforms in areas deemed suited to women (e.g., reforms in family, property and labour laws affecting women and children; public health work) (Roberts, 1979).

[92] By the late nineteenth century, the notion that women could cause a physical deformity or 'mark' their child had largely been dispelled as myth, but physicians continued to believe that a women's state of mind during pregnancy could impact the child's personality/characteristics (e.g., worrying while pregnant would lead to a child that stutters). Ballantyne (1914) for example explained that although it was difficult to prove causality beyond reasonable doubt, there was "some evidence that maternal mental perturbations had been the cause of both psychical and physical derangements in the infant" (p. 200). Thus, physicians often recommended that women should be 'happy,' 'cheerful' and 'calm' during pregnancy.

development occurs in stages gave rise to the notion that mothers could positively contribute to fetal development and actually enhance fetal outcome through proper behaviour. (p. 70). As I will discuss in later chapters, the aim of controlling fetal outcomes through prenatal care has been taken to such extremes in contemporary society that some view it as a form of positive eugenics.

This overview of exercise advice provided to women in the late nineteenth century provides valuable insight into the set of rules or procedures that shaped thinking during this time and allowed for certain statements to be accepted as 'truth.' These 'truths' then led to the creation of exercise prescriptions that restricted the extent to which females were able to freely experience their bodies, while simultaneously re-inscribing them into appropriate gender roles. Such an examination of the production of knowledge allows for a more sophisticated approach to the working of power relations. It calls into question the notion that physicians' exercise advice had a purely misogynistic intent (although some definitely took a negative view towards women) and illustrates how the advice was tied to the current understandings of female reproductive functions, fears of the decline of the nation state and the dominant ideology of separate spheres. Exercise prescriptions that resulted (i.e., that women should avoid sitting bent at a writing desk for long periods of time, that light housework is the best activity for women) were not based on 'realities' of the female body but rather contingent or what Foucault termed 'accidents of history.' In other words, the advice did not have to take this shape, but was one possible result of a whole series of complex relations between other events. Indeed, the way of viewing the (middle and upper class) female body during this time represents

what Fleck (1979) called a 'thought collective' and Foucault termed an 'episteme,' a certain way of understanding the world and constructing reality.

By the turn of the twentieth century, notes Vertinsky (1994), outdoor sports and athletics such as riding, tennis, golf and rowing were increasingly being accepted by establishment physicians as "a means of using carefully managed activity to strengthen women for childbirth and as a tonic to revive their enthusiasm for their housewifely duties" (p. 80). According to a female physician writing at the time, athletics had the potential to act as a panacea to the ill-effects of 'civilized life' in which hard honest labour in the fields or about the house had given way "to the life of the cities with the confinement of shops and offices, of halls of learning, the excitement of places of amusement, theatres, operas, of perpetual tea and bridge parties and so forth" (Parry, 1912, p. 354). In the absence of normal manual work, she explained, perhaps athletics were "the next best thing" (p. 354). Indeed, in her discussion of exercise advice for young girls and women in Ontario (1890 – 1930), Lenskyj (1983) notes a shift from the early preoccupation of the medical profession on the negative effects of mental strain to an emphasis on the benefits of certain kinds of outdoor sports and physical training, which had been established as part of the curriculum at many women's colleges.[93]

The general rule surrounding athletics for girls and women, however, was 'moderation, not competition' as concerns about the effect of physical activity and athletics on the female reproductive organs persisted (Lenskyj, 1983; see also Parry,

[93] This is not to say that a focus on the evils of higher education in girls did not remain, for evidence suggests that some doctors continued to believe that higher education made females physically unfit for motherhood (see for instance, Carstens, 1903; Goffe, 1911; Roberts, 1919; Smith, 1904; Van Dyke, 1905). However, not all physicians were as vehement in their disapproval, and faced with the realization that higher education of women would continue, it is likely that many doctors shifted their focus from the evils of this practice and proposed athletics as a way to counteract mental strain and develop the female body.

1912; Tait McKenzie, 1930). When considering early twentieth century medical ideas about the athletic capabilities of the female body, particularly instructive is an article published in the *American Journal of Obstetrics and Gynecology* by Angenette Parry (1912). In her paper entitled "The Relation of Athletics to the Reproductive Life of Woman" she presented a preliminary study based on letters and personal interviews with about forty obstetricians, college physicians and college athletic directors. Citing a lack of facts and statistics on the topic, she suggested that it is the duty of the medical profession to examine the issue and come to some definite conclusion in order to advise and train "our splendid army of American girls into the highest type of physical perfection possible for womanhood and motherhood" (p. 357).[94] The paper suggests that the central points of debate at the time were the effect of athletics on menstruation, uterine displacement (which was thought to cause sterility) and the process of childbirth. Medical viewpoints on the first two topics varied, from more progressive to conservative, although many of the comments illustrate that doctors continued to focus not just on health, but prescribe appropriate social and lifestyle behaviours.

Medical opinions also varied with respect to the effects of athletics on labour, with "more than half" of those surveyed stating that athletics favour easy labours, and others cautioning against excessive exercise. The following are some of the rationales behind the latter advice:

> the reproductive system is often dwarfed by the force going into overdeveloped arms and legs. The abdominal and pelvic muscles and ligaments do not necessarily share in the general muscles development. (p. 347)

[94] Parry also noted that it is a topic in need of study given changing notions of what constitutes an ideal woman: "Fifty years ago the pale, delicate girl was fashionable. A hearty appetite was a disgrace, outdoor sports were masculine, so our girls spent much time in doors in fancy work, crocheting, embroidering, dancing. Now they are off with a rush for the tennis court, the golf links, perhaps driving the motor car that takes them there" (p. 354).

> athletic women have long, hard labours – muscles of pelvic floor less flexible and not sufficient force to overcome them. (p. 348)
>
> the resistance offered by the cervix and perineum is greater than uterine development. The nervous condition suffers at the expense of our modern life. (p. 348)

There was no discussion of pregnant women performing athletics in the article, its exclusion suggesting that the performance of exercise and other rigorous activities during pregnancy remained taboo within the eyes of the medical profession. In what follows, I illustrate that during the first half of the twentieth century, medical ideas regarding physical activity during pregnancy shifted very little. What did change, however, was the context in which this advice was provided. It became part of the growing governmental apparatus called the prenatal movement such that the authority of those presenting the knowledge changed, as did the manner in which it was presented and the audience that it was intended for.

Significantly, early twentieth century prenatal exercise advice was also provided at a time when, in an attempt to gain greater control of the function of childbirth, members of the obstetrical profession began to construct *all* pregnancies and births as *potentially* pathological – and therefore in need of close medical attention (Arney, 1982; Mitchinson, 2000; 2002). In his genealogy of the rise of obstetrics, Arney (1982) explains that before childbirth was professionalized in the late nineteenth century, midwives handled 'normal' childbirths and called in obstetricians (male midwives) to handle 'abnormal' childbirths (often using barbs and hooks and, from the mid-eighteenth century onwards, forceps). Throughout the eighteenth and nineteenth century, the status of obstetricians grew as they positioned themselves as better equipped to deal with pathological pregnancies due to

their superior scientific knowledge (which was afforded increasing respect during this time). However, notes Arney, as obstetricians (and the medical profession, more generally) attempted to gain full control over childbirth in the late nineteenth and early twentieth century, it became obvious that not all births were pathological, nor could they be made to seem so. A central tactic was to cast birth as *potentially pathological*. Indeed, within the texts and journal articles that I reviewed, a common argument was that birth is an essentially normal or natural phenomenon but that there is an ever present chance that something might go wrong. Arney captures the changing view of pregnancy and childbirth and is worth quoting at some length:

> Birth was no longer simply 'normal' or 'abnormal'; nor was the birth process 'efficient' or 'inefficient' and subject to improvement through the intervention of a skilled practitioner. Now birth was something to be watched, not through the eyes of a person like a midwife whose job it was to attend birth, read its revelatory messages, and call for help when something went wrong, but through eyes trained to be sensitive to the signs of impending pathology. (p. 54)

It appears then, that struggles over the control of childbirth resulted in the growing perception of birth as potentially pathological, with the corollary effect that the pregnant body came to be viewed as always in potential danger and in need of guidance and examination by physicians.

Governing the Pregnant Body: The Rise of the Prenatal Movement

Viewed through a lens of governmentality, prenatal care was a response to several problems identified in the first decades of the twentieth century. High immigration rates, the poor quality of health of military recruits for WWI and low birth rates of middle class Anglo-Saxon citizens continued to fuel fears of race suicide in Canada (Arnup, 1994) as well as in UK and United States (Lupton, 1995; Oakley, 1984; Thomson, 2001). It was, however, the high rate of infant mortality which raised particular alarm amongst

Canadians during these years. In 1907, for instance, one in five babies in Canada died in the first year of life (Arnup, 1994) such that in a 1914 article in the *Canadian Medical Association Journal*, Dr. Alan Brown declared that "infant mortality is today one of the great national, social and economic problems. The future of every nation depends on its children, their physical, intellectual and moral strength" (Brown, 1914, p. 690).[95]

In response to concerns about infant mortality (and following the model of the United States and Europe), several biopolitical techniques were implemented. A number of Canadian provinces established child hygiene departments which oversaw the creation of birth registration systems to better track infant mortality, as well as campaigns to educate mothers on proper childcare (Arnup, 1994). Public health nurses began to visit new mothers in their homes and 'well baby clinics' were established where babies were weighed and feedings supervised (Brown, 1914, also see Arnup, 1994). Indeed, Armstrong (1995) asserts that it was the 'child' in the twentieth century that became the first target of the full deployment of surveillance medicine. He explains that "the significance of the child was that it underwent growth and development: there was therefore a constant threat that proper stages might not be negotiated that in its turn justified close medical observation" (p. 396). With the rise of surveillance medicine, he suggests, the distinct binary between normal and abnormal began to blur as individuals

[95] Drawing on statistics taken from the *Third Infant Mortality Report in Canada* (1912), Brown points out that Montreal had the highest infant mortality rates where 290 of every 1000 infants died in the first year of life (or over 1 in 3 babies) and the average for five provinces from which data could be collected (Manitoba, Ontario, Saskatchewan, Nova Scotia and PEI) was 125 in 1000. For more on the establishment of national vital statistics in Canada see *Maternal Mortality in Canada* (MacMurchy, 1928, p. 6). It is described how, before the establishment of the Statistics Act of 1918, the Dominion Statistician took a census but each province collected vital statistics. With the 1918 Act, a system of cooperation was established and carried out by the Dominion Statistician and from January 1, 1926 onwards all the provinces cooperated. Thus, we see a rise of biopolitical techniques in these early years of the twentieth century.

were placed on a continuum. Everyone was normal yet no-one was truly healthy so that all were required to come within the purview of surveillance.

While infant mortality rates began to decline by the early 1920s, fears about the health of the nation lingered as physicians turned their attention to high maternal mortality rates (see for instance, Ferguson, 1920; Hendry, 1923). Maternal mortality was a concern, for a healthy mother meant a healthy baby and in turn, a healthy nation. As one doctor explained, motherless infants are more likely to die or, if they survive, become delinquents (Fleming, 1933). Mothers therefore needed better care in order to ensure "individual and national efficiency" (p. 159). According to proceedings from the first Conference on Medical Services in Canada held in December 1924, the incidence of maternal mortality was particularly disturbing to the medical community as there was a growing belief that it was preventable (MacMurchy, 1925). As one doctor observed "the case stands strongly against [the medical profession]; the mother in the prime of life, the most valuable citizen in the community, dying from a preventable disease" (p. 295). An official enquiry by the Department of Health Canada on the state of maternal mortality in Canada took place between July 1925 and July 1926, culminating in a 1928 report entitled *Maternal Mortality in Canada*. The enquiry entailed collecting data from all legally qualified medical practitioners in Canada on how many of the deaths of female patients were related to childbirth. The final tabulation revealed that on average, four women were dying every day of the year in childbirth (MacMurchy, 1928). After tuberculosis, complications of childbearing were reported to be the greatest cause of death among Canadian women.

Shifting childbirth from home to the hospital was one perceived solution (resulting in the further medicalization and pathologization of childbirth).[96] Another solution was the provision of better prenatal care. In fact, the *Maternal Mortality in Canada* report stated that women "can almost always be saved by prenatal care" – although it was acknowledged that poor health (related to poverty, poor living conditions and exhaustion) was a factor in the death of many of the women (1928, p. 27).[97] The top causes of maternal death, however, were identified as puerperal sepsis (childbirth fever caused by infection) and toxemias of pregnancy (with eclampsia or convulsions being the most serious symptom and pre-eclampsia being the label provided to describe less severe toxemia) (Tew, 1938). Sepsis was thought to be preventable (if women maintained proper personal hygiene and physicians practiced sterile birth techniques) while toxemia was thought to be controllable through proper prenatal care, which could be provided at a prenatal clinic or through a physician visit.[98] The perceived need for prenatal care likely stemmed from (and reinforced) the view of pregnancy as a potentially pathological event – bolstering the status of obstetrics as well as the importance attached to the growing public health movement.

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[96] See Arnup, 1994; Lewis, 1984; Mitchinson, 2002 for more on the medicalization of childbirth in Canada, as well as Arney, 1982; Barker, 1998; Lupton, 1995; Oakley, 1984 for a discussion of the US and British context.

[97] Within the general medical profession there was some awareness that prenatal care and the increased medicalization of pregnancy alone would not improve maternal mortality rates but also required social welfare measures. Fleming (1933), for instance, pointed to underlying social and economic factors as indirect causes of maternal mortality, further explaining that "the best medical and nursing care will not meet the needs of a hungry mother" (p. 160-161). However, even Fleming noted that despite being a complex social issue, maternal mortality was ultimately a medical matter.

[98] While sepsis (or infection - often by doctors failing to ensure sterile conditions) was the top factor of maternal death in the report, toxemia was identified as the second highest cause of maternal mortality. Physicians were unsure of the cause(s) of toxemias of pregnancy although it was widely believed that the condition was associated with high blood pressure and protein in the urine (see Munro-Kerr et al. (1954) for a brief history of the medical investigation of toxemia). According to McLeod (1940), toxemia had overtaken sepsis as the leading cause of maternal mortality by the mid-1930s in Ontario.

At a prenatal clinic or during a doctor's visit, a thorough medical history was taken and a woman underwent a complete physical examination: pelvic measurements were taken, urine examined, blood pressure noted and abdomen palpated (Hendry, 1923). The prenatal clinics were a site to gather knowledge and information on "normal mothers" in order to help detect the "slight abnormalities" in others (Pines, Sept.1928, p.13), and the doctor visits contributed to this biopolitical project of data collection. The education of mothers was also a key purpose of prenatal visits as experts endeavored to instill the 'norms' of a healthy pregnancy and produce responsible citizens (in line with the aims of the emerging welfare state). For instance, W. B. Hendry, a doctor from Toronto, explained that at the clinic the expectant mother:

> is instructed concerning clothing, diet, exercise, personal hygiene, told to report regularly for examination and also whenever anything abnormal affects her, and she leaves the clinic with a sense of security, confident that she is being cared for during this critical period of her life. The social service nurses keep in touch with her in the duties and responsibilities of young motherhood and impress on her the necessity of regular attendance at the clinic. (April 1923, p. 253)

From this description, one can see that the prenatal visit was an exemplary site of disciplinary power. The disciplinary techniques of hierarchal observation, normalizing judgment and the examination were all put to use, and women were encouraged to monitor their pregnant bodies, looking for any deviations from the 'norm' and to seek help if needed. The growing surveillance of the pregnant body was thus akin to that noted by Armstrong (1995) in regards to child health in the early twentieth century; as physicians collected knowledge about the pregnant body, they could place a woman on a continuum which indicated the healthiness or 'normalcy' of her pregnancy. All pregnancies were therefore constructed as potentially abnormal, requiring surveillance.

In addition to face-to-face meetings with physicians and public health nurses, expert knowledge about prenatal care was circulated in the form of advice literature for women (Lewis, 1984). Beginning in the early 1920s, the federal Department of Health (which was created in 1919, followed by the creation of the Child Welfare Division in 1920), published a number of advice manuals for mothers, often called the *Blue Books* (given their blue covers), the most popular being the *Canadian Mother's Book* (1923) written by Dr. Helen MacMurchy, the Chief of the Child Welfare Division (Dodd, 1991). Dodd (1991) explains that this literature was not just for upper and middle class women (as was medical literature in late nineteenth century) but all women, including working class women. The *Blue Books*, according to Dodd, were the first recognition of the federal government's responsibility for the health of its citizens and foreshadowed the implementation of universal health care in Canada.[99] The books emphasized the necessity of listening to the doctor, and as educational tools they taught the reader about the necessary hygiene of pregnancy (including moderate exercise), how to prepare herself (mentally) for childbirth, how to prepare her home for the birth of her baby and how to care for the baby once it arrived. The government literature was thus another tool in the larger biopolitical strategy of prenatal care.

Chatelaine, a popular women's magazine at the time, also trumpeted the importance of prenatal care. From Sept 1928 to April 1929, for instance, the magazine ran a 'Mothercraft' series, explaining the basics of the hygiene of pregnancy and the responsibilities of women as they embarked on the "great adventure" of motherhood (Pines, October 1928, p. 19). The first article in the 1928-29 Mothercraft series stressed

[99] She also notes that the books highlighted a central contradiction of the time: women were expected to provide excellent care for their children and ensure their own good health – despite serious restrictions on accessibility of medical services.

the importance of prenatal care in creating a nation of healthy citizens, explaining that "many defects and tragedies are traced back to pre-natal times. Pre-natal or pre-maternity work is of interest to everyone and is being impressed on the nation as a whole" (Pines, September 1928, p. 12). The Mothercraft feature returned several years later as a regular 'Baby Clinic' column which shared the 'science' of proper childcare with readers and would intermittently remind mothers about the basics (and importance) of proper prenatal care.[100]

As alluded to above, the stress was not just on prenatal care, but the importance of starting with good genetic stock or having 'healthy' men and women who are "mentally, morally and physically free from disease" coming together to create children. The headline of one of the Mothercraft articles cried, "We Want Perfect Parents!" (Pines, September 1928) and to be sure, there was an obvious eugenics undertone to the prenatal movement in Canada (Dodd, 1991; McLaren, 1990; Thomson, 2001). Helen MacMurchy (who led the prenatal movement), along with many other public health reformers of the time, were at the forefront of the eugenics movement in Canada which sought to limit the reproduction of the socially unfit and breed hereditary weakness out of the population. While the segregation, institutionalization and sterilization of the 'feebleminded' - especially sexually deviant, unwed mothers - were the more drastic strategies advanced by reformers, there were also proponents of 'positive' eugenics, encouraging the 'fit' segments of society to reproduce (Dodd, 1991; McLaren, 1990; Thomson, 2001). Lewis (1984) notes that for many health care professionals, prenatal care meant not only medical attention for the pregnant woman by a qualified physician but also "the

[100] The "Baby Clinic" column ran until May 1941 (and was written by Dr. John McCullough) when it was taken over by Dr. Elizabeth Robertson and called the "Child Health Clinic." The child health column ran under various names and with differing authors well into the 1980s.

application of the eugenicist's view...that only those individuals certified healthy be permitted to marry and reproduce" (p. 338). The prenatal movement, inextricably tied to the promotion of white, middle class Motherhood, was part of this positive eugenics platform, another strategy intended to ease fears of race suicide and women's untamed sexuality (Dodd, 1991; Kline, 2001).[101]

Obstacles and Challenges: Instilling Prenatal Care as Patriotic Duty

Despite some recognition of the role that poverty and poor living conditions, as well as poor physician care played in the high rates of maternal mortality, responsibility for decreasing mortality rates was also placed on pregnant women who were to seek out prenatal care early in their pregnancy and closely follow medical advice (see for instance, Hall, 1928; Pines, September 1928; October 1928; Hendry, 1923; 1934).[102] Different approaches to the 'responsibilization' of women were evident, however. Some physicians and health care professionals openly chastised pregnant women for not obtaining proper care and laid direct blame on them for negative maternity outcomes. Writing in the *Canadian Medical Association Journal*, Atlee (1937) noted that in a review of toxemia-related maternal deaths, "all of these occurred in women who attended for the first time well-advanced in the condition, or who neglected to carry out advice" (p. 548). In an article that appeared in *Chatelaine* shortly after the release of MacMurchy's maternal mortality report, the assistant superintendent of the Victoria Order of Nurses (VON), Bertha Hall, reported that:

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[101] In her discussion of eugenics in the US between 1900-1960, Kline (2001) suggests that the movement appealed to many middle class women because it provided them with a central role in society. Motherhood was constructed as essential in the quest for race betterment.

[102] This idea was conveyed in government reports (MacMurchy 1928; Couture, 1940), medical literature (Hendry, 1923; 1934), as well as in the popular press (Hall, 1928; Pines, September 1928; October 1928).

> Prenatal care was given in 230 cases only, about fifteen percent. In forty instances, the physician reports that the prenatal care did not avail because the mother did not follow instructions, or because she came to see the doctor only once or twice at the beginning of pregnancy and did not return. (Hall, July 1928, p. 6)

And in *Hygeia*, a journal published for the general public by the *American Medical Association*, Edward Cornell (1934) posed the question:

> Why is it that child-bearing so often ends tragically? Is it the fault of the medical profession? In the large majority of instances I say, 'No'...It lies at the door of the general public, particularly the women...who had not had any medical attention previous to the onset of labor or had had medical attention only for a short time. (p. 981)

Other physicians (and government texts) took a softer approach, idealizing motherhood and calling on women to obtain prenatal care as part of their patriotic duty (although blaming was sometimes used in conjunction with this method). Dr. John McCullough, a doctor writing a guest column in the 1931 edition of *Chatelaine* magazine explained to the reader: "efficient prenatal care is the best means of reducing maternal mortality" and "the motto of every pregnant woman should be: constant supervision of doctor or clinic during the entire pregnancy" (McCullough, October 1931, p. 53). He went on to state that:

> if the ills of pregnancy are discovered early, and this can be done only through supervision by doctor or clinic, there will follow immediate improvement in the death rate of pregnant women. As soon as all women learn the value of this precaution, we shall soon observe...lower maternal death rates...it is a patriotic duty for the safety of the mothers of Canada, the preservation of a great race of people. (p. 54)

Similarly, the opening page of *The Canadian Mother's Book* (MacMurchy, 1923) stated that:

> This book has been written for you – a Canadian Mother. The Government of Canada, knowing that the nation is made of homes, and that the homes are made by the Father and Mother, recognizes you as one of the Makers of Canada. No

> National Service is greater or better than the work of the Mother in her own home. The Mother is "The First Servant of the State."(p. 5)

The text then went on to emphasize that obtaining prenatal care would help women fulfill their patriotic duty, illustrating how prenatal care was overtly linked to the health and strength of the nation-state, clearly a biopolitical strategy.

These entreaties by health care professionals to women to seek prenatal care (through blaming or by appealing to patriotism) illustrate that physicians and members of the public health movement had to work to incorporate prenatal care into the growing governmental apparatus of Canadian society. Through the use of this popular literature (in addition to the implementation of clinics and other health care policies) they constructed prenatal care as an essential part of pregnancy – attempting to instill the 'norms' of health into mothers. They also constructed physicians as the ultimate authority or expert in maternity care. In the *Canadian Mother's Book* (1923), the reader is told repeatedly to either "ask the doctor" or "see the doctor." In Letter No. 1 of *A Series of Nine Prenatal Letters for the Protection of the Mother and Child* (published by the Canadian Welfare Council) the reader is informed that "our first and most important instruction to you as the expectant mother is that you will at once place yourself under the care of your family physician for regular advice and supervision" (p. 2).[103] In the 1940 edition of the Canadian Mother and Child, Dr. Ernest Couture, urges women to "remain throughout these months [of pregnancy] under the constant supervision of a medical man" which, combined with adhering to the government advice literature, "should enable them to prevent and correct any irregularity in the course of their pregnancy" (p. 3-4).

[103] She is further told to "disregard the advice of well-meaning friends and neighbours if it differs from the advice of your family doctor" (1937, p. 2). Indeed, in her close examination of Canadian government texts from 1900-1960) Arnup (1994) also found that the advice of doctors was privileged over that of friends and neighbours which were often characterized as consisting of 'old wive's tales' (p. 68).

It was not just women (and the general public) who needed to be educated about the importance of prenatal care, for prenatal care advocates also recognized the need to inform physicians, as evidenced by articles within the Canadian medical journals and reports such as *Maternal Mortality in Canada* (1928) which laid some of the blame of high maternal mortality rates on doctors, calling for them to stop taking obstetrical care too lightly (see also McLeod, 1940). Such entreaties suggest that physicians (general practitioners) in Canada resisted the viewpoint being put forth by obstetricians that pregnancy and childbirth was a potentially pathological undertaking and required close and careful physician attention.[104]

We are therefore reminded that the importance attached to prenatal care (and obstetrics) in contemporary Western society is not a 'given' or 'the way it had to be' but the result of a complex assortment of power relations. In fact, a review of the literature of the time suggests that many women resisted seeking prenatal care in these early years. According to Fleming (1933), many women (especially middle class women) would not use the government funded 'in-patient/out-patient' clinics as they were viewed as charity clinics intended for the 'indigent' segments of society. On the other hand, they found the expense of a private physician to be non-essential or just plain prohibitive (see also Croft, 1957). Moreover, several articles in which physicians pleaded for an increase in state care (health care was privatized at this time in Canada) provide evidence to suggest that there was a lack of clinics in the early years of the prenatal movement. McCullough, for example, stated that:

> Much of the excessive mortality of mothers would be avoided by universal supervision of the pregnant woman. Indeed, so important is prenatal care as a

[104] Arney (1982) notes a similar attitude amongst the 'average' physician in the United States (p. 58).

> national economic measure that for those unable to employ a competent physician, such care should be provided by the state. (December 1935, p. 53)

With the rise of the welfare state in Canada (during and following WWII), additional state funding was provided and more clinics established – that is to say, prenatal care was more firmly incorporated as part of the governmental apparatus. In the 1949 edition of the *Canadian Mother and Child* it was observed that:

> To the credit of those in authority it may be stated that governments of the present day are giving more attention than ever before to the care of mothers, because it is recognized that the mother holds the key position with regard to the health of the nation. As evidence of the efforts made in the Field of Maternal and Child Hygiene, attention is drawn to our progressive health and welfare services, prenatal clinics, well-baby clinics, and visiting health nurses. Yet, however willing, governments and voluntary organizations cannot accomplish much without the response of the people, particularly of the mothers. (Couture, 1949, p. 6)

Arnup (1994) notes that while mostly poorer classes of women used the clinics in the early twentieth century, by the 1940s an increasing number of middle class women were attending prenatal classes and receiving care "perhaps as a result of the continued emphasis placed on prenatal care coupled with the growing number of pregnant women in the labour force because of the war effort" (1994, p. 73).[105] We can see, therefore, the link between the sayable (statements) and the visible (practices and arrangements) (Kendall & Wickham, 1999) as medical discourse/knowledge accepted as 'truth' impacted the routines and practices put into place in order to solve what was perceived to be a central problem: maternal mortality and in turn, the ill health of the nation. These early (welfare state) efforts to implant the 'norms' of health and education into mothers may be viewed as precursors to (and important in the success of) the current (neo-liberal) era of intensive motherhood in which prenatal care is no longer merely a biopolitical

[105] The number of hospital births in Canada also rose substantially during the first several decades of the twentieth century. In British Columbia, for instance, Lewis (1984) notes that almost 85% of births were in hospitals by 1940 (up from 46.7% in 1927) and almost 99% by 1960.

strategy but an ethopolitical one, as women voluntarily engage in 'technologies of the self' to be 'fit' mothers (see Rose, 2001). That said, when reviewing literature published in the late 1950s, I continued to come across articles lamenting high infant mortality rates and blaming women for ignoring the importance of prenatal care and not following doctor's advice in regards to proper lifestyle habits (see for instance Chant Robertson, April 1954; Croft, Feb. 1957).[106] And indeed, Arney (1982) argues that the technologies of self monitoring and surveillance did not fully gain ascendancy in obstetrical care until the 1980s.[107]

While my primary focus has been on the Canadian context, it is important to note that the push for prenatal care was not unique to Canada. In fact, Canadian physicians and public health promoters followed developments in the United States and Britain. Writing in 1951, a time when the importance of prenatal (or antenatal) care had been fairly well-established as a 'necessity' for women in Western society, Browne (1951) explained that "antennal care in its widest sense is no modern concept" (p. 1) given that many of the early writers on midwifery (dating back to mid 1500s) made some reference to the care of the health of the pregnant woman or to the treatment of the diseases and disorders of pregnancy. He asserted, however, that it was not until the early twentieth century that

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[106] Infant mortality was linked to babies born prematurely and premature birth was in turn linked to toxemia during pregnancy, something thought to be under the woman's control. In his article "Why Do So Many Canadian Babies Die?" featured in the February 1957 issue of *Chatelaine* magazine, Frank Croft explains that while the cause of toxemia is still unknown, "overweight predisposes all women to toxemia; there are likely to be four times as many cases in the overweight group as among women of normal weight. It certainly has a suspiciously close relationship to the banana split and chocolate éclair" (p. 66). Mothers were thus constructed as at least partly responsible for premature birth because too many had the tendency to 'eat for two.' These concerns about body weight during pregnancy (and toxemia) and their impact on pregnancy outcomes have gained prominence in contemporary Western society.

[107] The work of Weir (2006) provides further insight into the rising concern with infant death in the 1950s and beyond. She asserts that, with the merging of the categories of 'fetal' and 'neonatal' mortality, the rate of infant death 'around birth' (before, during and after birth) automatically increased and overshadowed the issue of maternal mortality, becoming an area of biopolitical concern.

there was an attempt to "secure the *routine supervision* of all pregnant women" in order to promote prevention of pregnancy-related difficulties (p. 2, emphasis in original).[108]

According to Browne (1951), it was Dr. J. W. Ballantyne who was the inspiration behind the prenatal movement in the early decades of the twentieth century and who, incidentally, came to be dubbed the 'Father of Prenatal Care.' Ballantyne advocated the establishment of pre-maternity hospitals which would facilitate the study of the physiology and pathology of pregnancy, furthering "knowledge of these subjects" (Browne, 1951, p. 7). He lamented the lack of interest shown by the medical profession in learning about the anatomy/physiology of the fetus and in using prenatal care as a way to improve the health of the child (this focus on the fetus instead of the 'problems of labour' was atypical at the time) ("Ballantyne and the New Midwifery," 1923, p. 441). According to Brown (1951), Ballantyne viewed the falling birth rate as one of the most pressing problems of the twentieth century and spent much of his time and energy advancing antenatal therapeutics that would benefit the fetus (as opposed to focusing on the mother's health) in order to ensure that the babies that *were* created were as healthy as possible. While his initial focus was on the study of fetal pathology (and the impact of intrauterine conditions on fetal life), by the end of the first decade of the twentieth century, Ballantyne was stressing the importance of the hygiene of pregnancy (i.e., ensuring the health of the mother so that she could have a healthier baby) in which "every medical man made it his duty to review with the pregnant patient all the rules relating to the care of the bodily functions, putting right what was wrong and warning against

[108] Browne acknowledged that, as early as the late 1700s, a few shelters/hospital wards had been created to care for pregnant women (mostly 'abandoned' or destitute women) but as of the late nineteenth century, there were few maternity hospitals or wards for all pregnant women and none in which a concerted effort was made to better understand the pathology of pregnancy.

possible errors in diet, clothing, habits and the like" (Ballantyne, 1906 cited by Browne, 1951).

Although Ballantyne might have been the 'Father of Prenatal Care,' Browne observed that he was not all that effective at implementing antenatal clinics and Britain owed the creation of such clinics to the United States, "...where the new ideas concerning prevention...had fallen on fertile soil" (p. 11). As early as 1901, a nurse began making antenatal visits to some of the women in the out patient department of the Boston Lying-in Hospital, and by 1912 the frequency of visits increased as had the number of women visited. Ballantyne began a similar programme in the UK, and as described above, Canada followed suit. According to an editorial in the *CMAJ*, it was not until Ballantyne's death in 1923 that the importance of his work (and prenatal care) was more fully recognized ("Ballantyne and the New Midwifery," 1923). As stated in the editorial:

> The need of prenatal care for the pregnant woman is now so universally accepted that it is difficult to believe that it is an idea with a history of but one generation, and due in no small measure, to [Ballantyne], who from a worldly standpoint, was comparatively undistinguished. (p. 441)

The writer of the editorial underscores the contingent nature of the newly established 'truth' that women require prenatal care (albeit unintentionally).

A quote by Ballantyne shortly before his death indicates that in his opinion, prenatal care had become incorporated into the governmental apparatus: "the pregnant, the parturient, and the puerperal woman and her infant have passed under the aegis of the public health authorities just as surely as the fever patient, the tuberculosis patient, the insane, and the school child" ("Ballantyne and the New Midwifery," 1923, p. 442). The pregnant body had become firmly established as the object of the medical gaze. In the

decades that followed medical professionals worked to instill the disciplinary techniques of self monitoring and surveillance into women.

Physical Activity During Pregnancy: Problem and Solution

In broad terms, exercise advice to pregnant women was quite similar to that which had been provided in the late nineteenth century, although subtle differences were apparent. With the increased attention towards antenatal care and the pathologies of pregnancy in the early decades of the twentieth century, the notion that proper hygiene in pregnancy could prevent the 'diseases' of pregnancy was given increasing weight – and scientific authority. Moreover, prenatal advice was no longer intended only for upper class women – or very poor 'indigent' women - but 'all' women and this was reflected in the emphasis on the importance of receiving sufficient rest during pregnancy. Although not specific to exercise but rather to physical activity, this likely influenced ideas about the physical capabilities of the pregnant body. Despite these subtle changes, notions about the dangers of violent activities persisted, as did exercise prescriptions that reinforced the separate sphere ideology.

In the *CMAJ* articles that I reviewed, physicians discussing toxemias of pregnancy typically explained that prenatal care (including proper diet, sufficient sleep and moderate exercise) could help to prevent toxemias from assuming malignant forms (Mitchell, 1929, p. 386; Dyer, 1945; Hendry, 1934; McQueen, 1924).[109] This idea was supported (and given more attention) by New Jersey physician, Dr. Arthur Bingham, who wrote an article entitled "The Prevention of Obstetric Complications by Diet and Exercise" (1932), suggesting that a combination of (moderate) exercise and diet could be used to help

[109] As mentioned previously, physicians were unsure of the causes of toxemias of pregnancy, and some suggested that excess weight gain during pregnancy was a possible cause of eclampsia and toxemia (see Atlee, 1937; Mitchell, 1937; Tew, 1938).

prevent toxemia, reduce anemia (in women) and make labour easier by "reducing the amount of fat in the pelvis" (p. 39). Similar to the authors published in the *CMAJ*, Bingham did not provide detailed exercise prescriptions for women (aside from a walk in the open air) or further explain his comment about reducing the fat in the pelvis. On the latter point, perhaps he was referring to earlier work regarding the importance of pre- and post-natal abdominal exercises (see Baughman, 1913; Koster, 1920).[110] Stressing the importance of prenatal care – and doctor's central role in overseeing it – one Canadian physician explained that:

> at the very outset the patient should be instructed as to her personal hygiene, the type of housework which she may carry on, her mode of living, the recreations in which she may indulge, etc, and if on interrogation, any or all of these should be found to be faulty, then it is incumbent upon the physician to rectify them, and thus avert any untoward results which not infrequently may be productive of much harm. (Nathanson, 1924, p. 496)

However, while prenatal exercise was referred to in several of the medical journals as part of the hygiene of pregnancy, references were typically vague, with little detail regarding actual exercise prescriptions. This suggests that while there was greater awareness of the role of prenatal care in helping to prevent toxemia (identified as a leading causes of maternal death), exercise was only one practice falling under the larger rubric of prenatal hygiene and didn't warrant all that much attention.

One of the few more detailed descriptions in a medical journal of appropriate prenatal exercise was provided by Atlee (1937) in the *CMAJ*. Referring to the pregnant patient, he explained that:

> she should get enough exercise, but this should not be of a violent nature: in effect, this means walking, golf or simple calisthenics. In this connection she should be warned against taking long automobile trips, since I have seen several abortions

[110] In this work, exercise was deemed helpful not only for the overall hygiene of pregnancy but with the mechanics of delivery.

> result from this apparently innocuous pastime. With regard to clothing the important thing is that a pregnant woman should wear enough of it, which is hard to enforce these days. (p. 551)[111]

More detailed guidance around prenatal exercise was provided in obstetrical textbooks. In *Expectant Motherhood*, Ballantyne (1914) advocated the importance of regular exercise in preventing constipation, toning muscles (an important consideration because the muscles in the abdominal walls play an important part in the birth of the baby), promoting a healthy appetite and digestion, helping to prevent "ennui" (p. 194) by affording interest and even recreation, and finally, keeping the circulation and respiration in good order. However, he did note that "there are different kinds of exercise" and that:

> the violent kinds, such as cycling, dancing and such games as tennis and hockey are obviously unsuitable for the pregnant woman and are, indeed, dangerous in the early months by reason of the tendency they have to produce abortion. (p. 194)

Walking was deemed to be "by far the best way in which the expectant mother can keep herself in condition" (p. 194-5) and motoring was also thought to be safe - provided the "car be a large, smoothly running one, with a careful driver who takes no risks" (p. 194).[112] There was no discussion as to why cycling, dancing, tennis and hockey have the tendency to produce miscarriage.

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[111] In a 1906 journal article on the hygiene of pregnancy written by New York physician Dr. Walter Jennings, a similar patronizing tone is taken as it is noted that "the large majority of [pregnant] women need certain hygienic rules laid down." With respect to exercise, he explained: "fatigue and violent exercise should be avoided, but moderate exercise, particularly in the open air is beneficial. Horseback riding, dancing or lifting heavy weights is injurious. Long journeys by land or water should be postponed...sewing on the machine should be restricted" (p. 38).

[112] There appears to have been a debate within the medical community in the first half of the twentieth century as to the impact of motoring while pregnant (and upon the female reproductive organs more generally) (see Beach 1947; Davis, 1909; Edgar, 1911; "Women Motorists," April 1913). A central concern was that the rapid motion of the motor car would subject women to frequent small jars that would be more or less violent depending on the condition of the road. The fear was that such a motion would cause the ovum to separate from the wall of the uterus. Physician views differed with respect to what point in a pregnancy was the most dangerous for motoring (first trimester versus second), as well as to just how dangerous this activity was, with some taking a less conservative view (see Edgar, 1911).

Joseph DeLee, a prominent obstetrician from the United States whose name and research was oft-cited in *CMAJ* articles, was a proponent of the idea that pregnancy is a 'pathological' process and this stance was reflected in his prenatal exercise advice.[113] In his text, *Principles and Practice of Obstetrics* (1913), he stated that:

> violent exercise, of course, is to be avoided. It is not possible to build up a strong muscular system during pregnancy. That should have been done before. To be avoided are jolts, running, sudden motions, lifting great weights, going up and down stairs quickly, horseback riding, cycling, riding over rough roads, golf, tennis, dancing and swimming. (p. 227)

He went on to assert that "railway travel, the automobile and ocean voyages had better be avoided, and if travel is necessary, the most comfortable accommodations must be secured" (p. 227) and further that pregnant women must "avoid crowds, for fear of getting into a crush" as well as "gatherings in close rooms, especially with stove heat, because the fetus is very susceptible to coal-gas" (p. 227).

In *A Combined Textbook of Obstetrics and Gynecology* (1928) (authored by four influential physicians from the UK, Munro-Kerr, Ferguson, Young & Hendry), it was also observed that "the condition of pregnancy, physiological though it may be theoretically, has a very narrow dividing line separating it from the pathological, and it is easier to tip the scale in the wrong direction during pregnancy than in ordinary circumstances" (p. 153).[114] Their stance is illustrative of the emerging trend within the

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[113] His moral stance and judgment on social issues is obvious in the text and he used medicine as justification for prescribing social roles. He was a proponent of eugenics and also subscribed to VET, suggesting that pubescent girls avoid 'crowding' their minds with studies and accomplishments as these would combine with "inappropriate reading and company" and "premature social duties" to rob girls of their vitality and develop minds at expense of bodies. He also cautioned that "too frequent intercourse during pregnancy often causes abortion, premature labour and even abruption placentae" (p. 224). While he questioned the notion of maternal impressions, he was a proponent of the notion that sudden frights/violent emotions could cause miscarriage or deform the fetus (p. 229).

[114] The authors noted that while pregnancy may be a normal function, under modern conditions (especially in cities), women do not always lead a healthy and natural life, and that "this is chiefly the case in the two

medical profession to construct all pregnancies as *potentially* pathological – and in need of close medical attention (Arney, 1982). The authors went on to advocate moderate exercise as essential for pregnant women and suggested that "a daily walk, short of inducing fatigue, should be insisted on" (Munro-Kerr et al., p. 153) From the middle of pregnancy onwards, an hour's rest per day (in a recumbent position – preferably with the feet up to relieve pressure on the pelvic veins) was recommended. Activities to be avoided were "standing about" (as it tends to produce pelvic congestion), as well as "violent forms of exercise such as cycling, riding, etc" – although "the milder recreations may be indulged in with advantage" (p. 154).

Exercise advice was also presented to pregnant women in the popular literature and government texts under the rubric of Mothercraft and as such was linked to notions of patriotic motherhood. It was explained in one of the initial Mothercraft articles in the October 1928 issue of *Chatelaine* that:

> [n]o athlete enters for a race and then prepares for it by eternally resting. During the pregnancy and birth of the baby the mother's abdominal muscles are constantly in use and exercise is absolutely necessary to strengthen them for the ordeal. Simple exercises must be commenced gradually and done evenly, always bearing in mind that one must *stop short of fatigue*, and these should be done under the direction of the doctor or public health nurse. (Pines, October 1928, p. 56, emphasis in original)

In addition to drawing upon the late nineteenth century notion of 'training for childbirth,' Pines also warned that "strenuous exercise and heavy lifting should be avoided as should too much motoring" (p. 56) and the medical doctor (or nurse) was clearly positioned as an expert on appropriate activities for the pregnant woman who was in turn constructed as in danger of damaging her reproductive outcomes if she exercised too vigorously or alternatively, not enough. The reader was also warned that when pregnant "there is no

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extremes of society – the wealthy and the luxurious class, and those at the other end of the scale, who are often underfed and overworked" (p. 153).

great change in the normal manner of living but the individual personal responsibility to maintain this fitness is accentuated because the expectant mother has another helpless life dependent on her actions and thoughts" (p. 19). In the advice offered in the first Mothercraft column, the pregnant woman was constructed as personally responsible for a healthy outcome by carrying out the appropriate amount of exercise. The emphasis on the personal responsibility for health – something typically linked to the neo-liberal turn – clearly had emerged in the early twentieth century for the pregnant woman, reflecting the increased emphasis on fetal health that had arisen out of the prenatal movement.

The notion that the pregnant woman must strike a fine balance with regards to exercise – enough but not too much – was common in the *Chatelaine* column over the next several decades. Although I did not encounter any articles that focused on prenatal exercise exclusively, the topic was discussed in the context of prenatal care several times from the late 1920s (in the initial Mothercraft articles) and into the 1940s. In February 1933, the editor (Byrne Hope Saunders) announced the beginning of a regular column entitled "The Chatelaine's Baby Clinic" which would feature an article, as well as a question and answer section written by Dr. John W.S. McCullough, Medical Officer of Health for Ontario. In his first article on prenatal care, McCullough (Feb, 1933) explained that women "must not be afraid of exercise" as "a normal life is best. She may continue to carry on her household duties, taking care that she does not unduly tire herself. Overwork, lifting of heavy weights or straining overhead work and over-reaching must be avoided" (p. 60). The next month he explained the importance of exercise in removing waste matters from the body, noting that exercise "causes deep breathing with consequent ventilation of the lungs and the removal of wastes therefrom. It induces perspiration and

activity of the skin; it strengthens the muscles and helps to relieve constipation" (March, 1933, p. 58). However, he advised against engaging in "the more strenuous forms of exercise such as rowing, swimming, golf, tennis and horseback riding" as these activities were thought to cause miscarriage.[115]

The government literature provided similar exercise advice - although the pro-natal message was stronger. The *Canadian Mother's Book* (MacMurchy, 1923), in particular, provided relatively detailed information relative to other publications of the time. The reader was reminded that "you are not an invalid and are not going to be an invalid. You need exercise and fresh air as much as ever" (p. 20). Despite this assurance (and attempt to construct pregnancy as 'natural'), the reader was then given a series of cautions:

> Don't run the sewing machine too much. Don't climb the step-ladder, and if the street car steps are too high, get the conductor or some other kind man or woman to help you up and down. No sudden stops, or shocks, or jerks, or jumps or jars for you just now. You are not dancing at present or playing tennis or climbing mountains. Gentle exercise for you – walking is the best. (p. 21)[116]

Viewed through a feminist lens, such advice is problematic as it serves to restrict the 'allowable' activities and behaviours of pregnant women, also having the potential to make women who could not avoid 'running the sewing machine' or climbing the step-

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[115] His advice about prenatal exercise became increasingly curt over time and in a later column he told the reader "Get eight hours sleep with plenty of fresh air in your room. Rest for an hour after the midday meal. Take moderate exercise every day. Avoid lifting anything heavy" (August 1939, p. 48).

[116] Lenskyj (1983, p. 81) notes that the bicycle and sewing machine were viewed by some as using the same muscles, which might explain the cautions related to sewing, even though it was a traditionally 'female' pursuit. Indeed, some doctors in the late 1890s, referring to the stimulation of similar muscle groups in the two activities, suggested that women might as well stay home and sew in their leisure time (as opposed to cycle) to get the same benefits. This example illustrates how housework was seen as appropriate exercise/therapy for women, and draws attention to a sexist double standard: women (not men) must spend leisure time productively. That pregnant women were cautioned *not* to do this activity demonstrates the extent to which the pregnant (middle class) body was viewed as at risk.

ladder in their daily lives feel anxious and guilty, negatively impacting their experience of pregnancy and their bodies.

Similar sentiments were expressed in the *Prenatal Letters* (issued by the Canadian Welfare Council) – although a direct link was made between certain activities and the possibility of a miscarriage. The reader was told that "one of the dangers of pregnancy is the possibility of a miscarriage, a danger that is greatest during the first four months. A miscarriage is usually the result of not carrying out the rules already laid down" (1937, Letter No. 3, p. 3). She is specifically warned of the dangers of overwork, violent exercise, lifting heavy objects, running the sewing machine and long motor trip – and told to avoid these unsuitable activities.

Despite the popular advice that pregnant women should avoid all 'violent' exercises, within some medical texts it was acknowledged that the cause of miscarriage was more nuanced than this advice might suggest. DeLee (1913) noted that many women view miscarriage as caused by trauma or violence and questioned this reasoning, explaining that a "special disposition" must be present to bring on a miscarriage:

> unless it is applied to the uterus direct, we must assume that one of the predisposing causes – endometritis, etc – is really active. A special predisposition must exist to explain those cases where a slight jar, a misstep, a nervous shock, an automobile ride, and other mild occurrences bring on abortion. (p. 418)

According to DeLee, some pregnant women could endure the "severest injuries, mental and physical" without the slightest effect on the uterus and therefore "much depends on the individual" (p. 227). Despite this recognition, he advised all women to avoid rigorous activities with the warning that "violent exercise, of course, is to be avoided. It is not possible to build up a strong muscular system during pregnancy. That should have been

done before" (p. 227). Canadian physician, Atlee (1937) took an approach akin to DeLee with his observation that:

> while the average pregnant woman can indulge in fairly violent forms of exertion without aborting there is no doubt that these do threaten the life of the fetus in a considerable number of cases and for that reason should be advised against for all pregnant women. (p. 550)

Physicians thus continued to differentiate between exciting and predisposing causes of miscarriage, although a slightly different approach was taken than in the late 1800s when predisposing causes were overtly linked to immoral lifestyle behaviours such as excessive indulgence, occupying overheated and overcrowded rooms, and too frequent intercourse, to name a few. Instead, for DeLee and others, a predisposing cause was typically a diseased, degenerated or previously injured uterus – although such disorders were often linked to the woman's previous lifestyle behaviours such as contracting syphilis or wearing too tight clothing (Ross, 1903, p. 101; see Riddel, 1926).[117] Thus, it appears that there was a shift away from VET and greater attention to (as well as investigation of) the pathological nature of women's actual reproductive organs (her uterus). Because physicians could never be certain as to the state of a women's uterine health prior to pregnancy, many issued blanket statements advising *all* women to avoid any possible 'exciting' causes that might in turn cause a miscarriage. That said, some physicians provided a slightly more nuanced view. In his discussion of the safety of certain types of travel by air or ocean steamer Ballantyne (1913) noted that there were differing opinions on the matter. His suggested that physicians base their advice on women's past pregnancy experiences:

[117] Significantly, Ross suggested that tuberculosis and syphilis lower the vitality of the mother causing disease of the placenta and malnutrition of the ovum, with syphilis being the "more frequent cause of abortion" (p. 101). Miscarriage was therefore positioned as the fault of the mother who is careless and sexually promiscuous.

> If the woman has in a previous pregnancy had a miscarriage, everything beyond the gentlest exercise is a danger, whilst if she has carried several children to the full term without a mishap, she may be allowed much more liberty; consequently, if hers is a first gestation, and her tendency in respect of abortion unknown, the wise plan will be the cautious one. (p. 195)

The need for rest was also a central theme to arise in the rules of pregnancy hygiene – preferably for at least an hour during the daytime in the recumbent position, plus 8-9 hours sleep at night. Munro Kerr et al. (1928) recommended an hour of rest per day from the middle of pregnancy onwards (in a recumbent position – preferably with the feet up to relieve pressure on the pelvic veins), and an afternoon nap was recommended in the *Canadian Mother's Book* (1923). The government text advised women to:

> take off your clothes, put on your nightdress and lie down and take a rest every afternoon; often you will sleep. It will do you all the good in the world…lie down in ten minutes in the morning, too, if you feel tired. (p. 22)

The importance attached to rest during pregnancy in these years is not surprising considering that one of the key aims driving the implementation of routine prenatal care was to reduce maternal mortality. For instance, the report *Maternal Mortality in Canada* (MacMurchy, 1928) cited fatigue as one of the major causes of maternal mortality and morbidity – with more rest being one solution. Physical activity per se was not likely the cause of maternal death but rather a combination of poor housing, nutrition and extreme exhaustion. However, the notion that the pregnant body was fragile and in need of rest continued to cling to the pregnant body once material and social conditions improved.

In a related point, the emphasis on rest also reflected the intended audience of the texts and the object of prenatal care more generally: *all* women. Texts were no longer written solely for upper class women (as was the case in the nineteenth century literature) but poor and middle class women as well - including those who labored rigorously in

their daily lives (on farms, cleaning their houses and/or in factories). Indeed, in several of the texts it was suggested that 'additional' exercise was unwise for women who worked in factories (as well as often hard to obtain) (see Feldman, 1927; Lobenstein & Bailey, 1926). Ballantyne (1914), for instance, asserted that:

> there are expectant mothers...to whom rest is a more important matter than exercise. These are the working women, the married women who are employed in factories and other forms of exhausting labour; to them, for their own sakes as well as for the welfare of their unborn infants, rest in the last weeks of pregnancy is of immense value. (p. 195)[118]

Despite constant reminders to rest, housework continued to be positioned as an excellent form of exercise for the woman provided she did not overstrain herself (see Canadian Welfare Council, Letter 4, 1937; DeLee, 1913; Lobenstein & Bailey, 1926; Randell, 1939).[119] The notion of housework as therapeutic exercise is a theme that has run throughout medical literature from the mid nineteenth century (for pregnant and non-pregnant women alike) reinforcing traditional gender roles and inscribing women into the domestic realm (Stanley, 1996; Vertinsky, 1991). I came across several examples of

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[118] I also came across a body of literature advocating the creation of social welfare programmes for female factory workers who became pregnant (although not in the Canadian context). In several of the articles physicians expressed concern about the impact of work on expectant women and new mothers and advocated the legislation of paid post-natal leave for women (Sykes, 1907; McCord & Minster, 1922; McIlroy, 1922; "Women in Industry," 1919), as well as a short period of pre-natal leave (Sykes, 1907; McIlroy, 1922). Several physicians asserted that women should be permitted to continue to work while pregnant - but at lighter duties and under the strict supervision of the plant or factory physician - as they could then earn wages to buy food as well as receive prenatal care from the factory physician (see Adamson, 1929; Sykes, 1907; Deacon, 1918; "Women in Industry," 1919; McIlroy, 1922; McCord & Minster, 1922). In contrast, Martin (1916) and McCullough (1920) both published articles in the (Canadian) *Public Health Journal* in which they pointed to the ill-effects of women in the workplace. McCullough argued that it led to increased rates of infant death and Martin pointed to the decrease in birthrates as married women shirked their maternal duties in favour of paid labour. See also Jones (1912).

[119] Advocating housework as appropriate physical activity of course worked to maintain the gender order of the time – keeping women in domestic realm and dependent on the male. Dodd (1991) notes that MacMurchy was an advocate of certain domestic rights for mothers in the hope that this would lead to better health care for women (and result in healthier babies). She demanded that domestic work be accorded greater respect, even professionalized, and that women be given assistance in the home (from husbands, children, hired help). Thus, while advocating women's rights, she reinforced traditional roles for women – as opposed to moving towards a liberal feminist notion of equality.

attempts to legitimize the idea by making it more 'scientific.' For instance, a 1921 article in *Science* reported on the caloric output of sewing (Langworthy & Barott, 1921) and a 1923 *JAMA* article entitled "the cost of work – in calories" discussed energy expended by women in household tasks such as ironing, sweeping and washing (which, incidentally, was more than in knitting, croqueting, darning and sewing) and suggests that new research provides "a liberal range of choice of therapeutic tasks for women" ("Cost of Work," 1923, p. 188). This line of research still exists as evidenced by an article published in 2007 in which the authors measured the energy expenditure by pregnant women conducting household tasks, with the inference that such activities would facilitate the completion of recommended levels of exercise (Chasan-Taber, Freedson, Roberts, Schmidt, & Fragala, 2007).

Conclusion

Concerns about violent activity, calls for rest during pregnancy and exercise advice that (re)inscribed women into 'proper' gender roles constituted the status quo within the medical literature well into the 1960s. Even after unprecedented numbers of women (including middle class married women and pregnant women) entered the labour force during WWII to work in munitions factories and other 'male' jobs,[120] medical ideas about the physical capabilities of the pregnant body showed little change. In fact, the disruption to the social order caused during WWII generated numerous articles within the medical literature concerning the compatibility of female (reproductive) bodies with

[120] Between 1939 and 1944, the number of women in the paid labour market almost doubled to 1.1 million with the most pronounced increase amongst married women and mothers (Keshen, 2002, p. 253; see also Roach Pierson, 1977; 1986).

heavy factory work.[121] As Arney (1982) explains in his Foucauldian-inspired examination of professional power and obstetrics "changing a significant part of culture is never an easy task nor does it proceed simply" (p. 21). He continues that changes are typically required on at least two levels:

> one must effect change in the symbolic order and in the material aspects of society, the level of meaning and the level of social practices. Changes in the symbolic, conceptual aspects of culture are used to bring about change at the material level, and vice versa. (ibid.)

Middle class and pregnant women working in factories during the war constituted a change in social practice. However, this change was constructed as 'temporary' such that the ways of knowing and meanings attached to the female body were only troubled, and following WWII there was a concerted effort to re-inscribe women into domestic roles leading to what Betty Friedan (2001, original 1963) famously called 'the feminine mystique' (Porter, 2004; Roach Pierson, 1986).

Following the war, the pregnant woman continued to be cautioned about the dangers of vigorous activity, overexertion and the need for rest within the medical literature (Browne, 1951), popular advice literature (Chant Robertson, March 1943; Aiken, January 1955; Hilliard, 1954; 1957; 1960) and in government texts (Couture, 1949). In fact, in the 1949 edition of the *Canadian Mother and Child* (1940; 1949) (which was written by Dr. Ernest Couture and replaced the *Canadian Mother's Book*), the reader was not only warned that "horse-back riding, bicycling, motor cycling, skiing, curling and bowling are out of the question" and that "competitive sports also are too

[121] In my Index Medicus review I found several articles concerning how best to deal with women in the workplace. The primary concern was that the weaknesses of women's reproductive organs would prevent them from being productive and efficient employees but also in evidence was concern that the hard physical labour would damage their reproductive organs, with special attention to how best to deal with the pregnant worker.

strenuous to be indulged in" (p. 22-23) but was informed that she should not even attend certain sport events as *spectators*.[122]

Despite changing ideas regarding the importance of prenatal care (or perhaps because of them), the ways of viewing the female body and appropriate gender roles had changed little since the nineteenth century. Similarly, ideas regarding appropriate physical activity during pregnancy remained similar, although there was some alteration due to the growing medicalization of childbirth and the concomitant attention to the pathologies of pregnancy. More specifically, some physicians linked moderate exercise to a reduction in the occurrence of toxemia (pre-eclampsia) - an idea which has increased in prominence in the last several years as I will discuss in later chapters. Because toxemia was identified as one of the leading causes of maternal mortality, mild exercise was recognized as a component in pregnancy hygiene – albeit not a central one. However, by linking mild physical activity to the growing practice of prenatal care, physical activity in turn became linked to notions of 'health,' 'nation-state' and 'patriotic motherhood,' all part of the solution to the problem of maternal mortality. That said, the more prominent theme to emerge in the literature was the dangers of 'rigorous' physical activity to the safety of the fetus and to the mother. Calls for caution – and the need for rest - were dominant.

Within the governmental complex, exercise during pregnancy occupied the double position of solution (to maternal mortality) and problem (to fetal and maternal health). The emphasis remained on the latter, however, and the key physical activity-specific concept to arise from the medical statements and enunciations of the time was

[122] Couture explained that attendance at events such as hockey and football matches "is not suitable during these momentous months because of the excitement, and also at times on account of the prolonged exposure to cold" (p. 22).

that of danger (to mother and fetus). There were, however, additional discourses in circulation in the first several decades of the twentieth century that, on the surface, challenged mainstream medical ideas about pregnancy and exercise in that they linked together the concepts of 'pregnancy' and 'athletics.' In the next chapter I examine these discourses in more depth, exploring the extent to which they functioned as counter-discourses, creating alternative knowledges and speaking alternative truths – a form of resistance.

CHAPTER FIVE

Resistance and Counter Discourses? Athletics and the Pregnant Body

In this chapter I examine two groups of statements pertaining to pregnancy and exercise that emerged in my examination of medical and popular literature from the early twentieth century to the early 1970s: 'training for childbirth' and 'sporting moms.' I focus on the relation of these discourses to the mainstream (or 'traditional') medical statements discussed in the previous chapter, and then consider the extent to which they acted as 'points of resistance' to traditional ways of thinking about the pregnant body and its physical capabilities. I comment on the degree to which they challenged existing power relations and how/if they worked to effect social change.

This chapter therefore serves as a case study to examine Foucault's ideas regarding power and resistance. According to Foucault, resistance always operates within power relations and occurs at multiple points throughout society. Because it is in discourse that power and knowledge are joined together, resistance takes the form of 'counter discourses' or 'reverse discourses' that produce new knowledge, speak new truths, and in doing so constitute new powers (Ramazanoglu, 1993). Indeed, it is important to note that, according to Foucault, discourse can be viewed as a series of discontinuous segments whose tactical function are never uniform or stable. As Foucault explained:

> Discourses are not once and for all subservient to power or raised up against it, any more than silences are. We must make allowances for the complex and unstable process whereby discourse can be both an instrument and an effect of power, but also a hindrance, a stumbling-block, a point of resistance and a starting point for an opposing strategy. Discourse transmits and produces power, it reinforces it, but also undermines and exposes it, renders it fragile and makes it possible to thwart it. (p. 101)

Foucault's work on resistance has been critiqued as vague as well as androcentric. Feminists, in particular, have noted that the examples that he *does* provide are typically male-centered (McLaren, 2002; Ramazanoglu, 1993). This chapter therefore aims to extend and build upon Foucault's ideas regarding resistance by examining counter-discourses in the discursive field of exercise and pregnancy.

I begin with a discussion of work published by health care professionals interested in 'training for childbirth' (which later became linked with and subsumed by the larger 'natural childbirth' movement which focuses on the psychosomatic aspects of childbirth). I suggest that while 'training for childbirth' and natural childbirth advocates challenged traditional medical ideas and statements in some respects (i.e., who should be in control of childbirth), the extent to which they disturbed notions regarding the capabilities of the female body and social roles is questionable. I use this example to illustrate that discourse cannot be viewed in binary terms such as accepted/excluded or dominant/dominated as the tactical strategies and moral positions of individuals and groups involved in the production of discourses are more complex than such binaries allow. Following this focus on 'training for childbirth,' I turn to an examination of discourses within the field of sports medicine which emerged in the 1950s and grew in status in the following decades (Safai, 2007). It was in this field that long-standing ideas regarding the limited physical (sporting) capabilities of pregnant women began to be challenged, particularly in the mid to late 1960s. In this section I argue that it was the actual *act* of pregnant women competing in high level athletics while pregnant (i.e., resistance through embodied acts) that resulted in a gradual shift in medical viewpoints and ways of thinking. I assert that while it was the social (lived) practices of women that began to shift the meanings

attached to the pregnant body, these stumbling blocks or developing oppositional strategies found further footing in wider social changes that were occurring at the time.

Training for Childbirth: Childbirth as an Athletic Feat

As discussed in the previous chapter, the idea of 'training for childbirth' was evident in the late nineteenth century medical literature. Some physicians had pointed to the dangers of an overly indulgent and sedentary lifestyle, suggesting that women should engage in a modicum of exercise in order to emulate the (perceived) easier birth experiences of 'savage' women and poor women. A few of the texts (notably the ones written by women) even provided detailed exercise programmes and drills for expectant mothers. For example, in *Preparation for Motherhood*, Scovil (1896) outlined a number of exercises intended to help women train the muscles involved in expelling the child from the uterus, as did Stockham (1893).

Despite these early allusions to 'training for childbirth,' it was in the 1930s and 1940s that the belief that labour was a great muscular feat - and that exercise could act as a prophylaxis against prolonged and abnormal labour - began to gain momentum in England (Blankfield, 1967; Burnett, 1956; Rankin, 2002).[123] It is significant, however, that the 'new' training for childbirth discourse existed in a field of power relations that was altered from that of the late nineteenth century. As discussed in the previous chapter, the first several decades of the twentieth century witnessed the growing medicalization of pregnancy and childbirth as obstetricians came to exert an increasing amount of control over the birth experience and obstetrics became a respected specialty area (Arney, 1982; Mitchinson, 2000; 2002). In this context, the 'training for childbirth' discourse that

[123] There was also a body of literature discussing the value of abdominal exercises in helping young women prepare for pregnancy (before conception) (see Baughman, 1913; Knowles, 1933; Koster, 1920; Parry, 1912).

emerged in the 1930s and 1940s offered an alternative view of the birth experience and how it should be prepared for (see, for instance, Dick Read, 1933; Morris, 1936; Randell, 1933; 1939; Vaughan, 1942; 1943). 'Training for childbirth' advocates were often women (although the two programmes that rose to prominence in the 1950s and beyond were created by men) and they proposed to help women prepare for birth, with the aim of making childbirth less fearful and painful, thus decreasing the need for medical intervention. The ultimate goal was to limit the use of anesthetics/drugs given to the mother so that she could stay in control of the birthing experience and experience the true pleasure of motherhood (Sandelowski, 1984). Natural childbirth and the 'training' that it required therefore posed a challenge (or alternative viewpoint) to traditional medical authority and practices.

While variations in the programmes existed, the typical strategy was to teach women relaxation exercises as well as exercises which trained their birthing muscles (see Blankfield (1967) for an overview of the various viewpoints/techniques). In her 1933 article "In Pregnancy, Puerperium and After," Minnie Randell, a British physiotherapist, proposed several yoga-like exercises for the expectant woman unable to take sufficient exercise during pregnancy. The exercises were intended to help her relax during pregnancy (through deep breathing/meditation) and to train core muscles used in child bearing (as well as tightening up the muscles afterwards). Randell later wrote a book called *Training for Childbirth: From the Mother's Point of View* (1939; 1949) which expanded upon her earlier article. In it she explained that the exercises and postures that she outlines were all adapted from those used in "well-known Swedish, American and

German systems [of gymnastics]" (1939. p. ix). She further extended the sport and training analogy stating that:

> just as practice and development of highly specialized technique are required for athletic success, so in training for childbirth every muscle, ligament and joint in the body should be supple, because they will all be required to work in the expelling. They should be under control, some relaxed, some active, using energy when energy is required and conserving it when it is not required. (1939, p. 34)[124]

The work of Randell had much in common with that of Kathleen Vaughan, a female obstetrician from London who coined the phrase 'childbirth as an athletic feat' (1934; 1942; 1943; 1951).[125] During her time in India, Vaughan observed that hard-working outdoor women had little difficulty in birth while women of the 'better-off' classes (who did little physical labour) and urban-dwelling women (who worked hard but behind a counter or closed doors and ate processed foods), often had difficult confinements. She suggested that the solution to the problem of excessive medical intervention in childbirth was to lead a more 'natural' life (out-of-doors) and to regain the lost art of a natural childbirth. Indeed, referring to the outdoor women she asserted that "strenuous exercise keeps her whole body fit and flexible, and she bears a family of healthy children with less trouble than the townswoman makes over one" (1943, p. 252). She believed that her combination of exercises - which were always to be performed to

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[124] In the introduction of her book she describes how earlier in her career she worked with Dr. J. S. Fairbairn, a respected and well-known obstetrician in a London hospital who advocated a combination of postnatal relaxation exercises (training for rest) and special bed exercises (training for activity) to help women recover from childbirth. Fairbairn believed that some form of physical preparation could help women to prepare for childbirth and upon his retirement he urged Randell to expand the postnatal exercises to include prenatal instruction. She did so and notes that while she was not asked back to the London hospital (after Fairbairn's retirement) she was asked to pilot a class for antenatal postures and exercise in two of the Fulham Clinics. She began to work with Margaret Morris, who was trained in massage and medical gymnastics, and helped Morris to write a book called *Maternity and Post-operative Exercises in Diagrams and Words* (Morris & Randell, 1936), which contained many of the same exercises in Randell's 1939 book and more – arranged to music. Rankin (2002) suggests that Randell and Morris were largely responsible for the development of antenatal and postnatal exercise programs (in Britain) (p. 28).

[125] Vaughan's work is referred to several times in Randell's books as she describes how – after working on the topic independently for several years – she discovered Vaughan's ideas which were similar to her own.

music - would lead to an easier and shorter labour by training the muscles groups used in childbirth to contract and/or relax in a synchronous manner (i.e., as one group contracted the opposing group would relax) and that they would also increase the flexibility of the pelvic joints (she viewed the development of joint flexibility to be particularly important).[126] As she explained:

> Perfect ease in parturition is like perfect ease in swimming or in playing games and necessitates a trained control of muscular contraction, and still more difficult to learn – relaxation of the opposing muscles until the coordinated movements become instinctive. Childbirth is really an athletic feat in which the mother must be the chief attendant, and to play her part properly she needs specialized teaching and training. (1942, p. 6)[127]

Both Randell and Vaughan advocated squatting exercises (and Randell lunging exercises) to help enlarge the pelvis, as well as increase the elasticity of the perineum to minimize damage during birth. The practice of conducting exercises to widen the pelvis was subsequently critiqued as ineffective and even dangerous by members of the medical profession (Young, 1940; see also Rankin, 2002), a critique that may have been related to the fact that the creators of the exercises (especially Vaughan) also believed that squatting *during* birth was optimal. Indeed, assuming such a position during birth did not conform to the standard procedure established by obstetricians in the first half of the twentieth century: giving birth in a dorsal position (with the woman's legs in stirrups). Both Arney (1982) and Sandelowski (1986) suggest that this spatial arrangement was favored (even enforced) by obstetricians as it allowed them greater control over the actual birth procedure and better 'visibility' of the woman. It is also possible that squatting during childbirth symbolized a move towards 'native' or 'savage' forms of birthing in the eyes

[126] Her exercises consisted of a series of movements which entailed hollowing the back, squatting , leg-swinging and stair-stepping and some pelvic arch/pelvic floor stretching.
[127] She also felt that exercise was a good way to keep fat down on the mother and baby – and thought that women should aim to have a small baby (Vaughan cited in Randall (1939)).

of some obstetricians, this 'animalistic' version of birth being exactly what they were attempting to 'tame' through their techniques of Western medicine (Kitzinger, 1990; Sandelowski, 1986). In order to gain greater acceptance of her exercises, it appears that Vaughan reframed her teachings in later years, acknowledging the physician's position of authority. In her final published book, *Exercise Before Childbirth* (1951), she wrote: "Remember you must co-operate with your doctor and nurse. Do just as they wish" (p. 35). She further explained that the two squatting positions for confinement illustrated in her book were "only to show you the natural postures in childbirth, and most women find they relieve backache and make for quick and easy delivery" (p. ibid). However, if the reader practiced for confinement by doing the exercises outlined in the text, she would have helped to shape her pelvis and increase joint flexibility so that the actual posture assumed during childbirth "need cause but little anxiety" (p. 35).

Dr. Grantly Dick Read, a male physician from Britain, focused on psychological preparation for childbirth, arguing that if fear could be replaced with knowledge and understanding, then women could have pain-free labours without the use of anesthetics (Thoms & Goodrich, 1949; Hamilton, 1958). The first step of Read's natural childbirth was to "learn the true facts about childbirth to overcome the fears planted in her mind by association and hearsay since she was a young child" (Hamilton, January 1958, p. 17). The second step was to learn how to breathe correctly which would in turn help women to relax and ease the pain of birth. Pregnant women following Read's programme were to learn a series of exercises which fell into two groups: "those which aimed to increase the tone and efficiency of the back, abdominal and perineal muscles" and "those that promote physical relaxation" (Thoms & Goodrich; 1949, p. 1257).

Randell, Read and Vaughan can be considered pioneers in the field of antenatal education and individuals that subsequently published books on the topic often cited indebtedness to their ideas. For example, Helen Heardman, a British physiotherapist who wrote *A Way to Natural Childbirth: A Manual for Physiotherapists and Parents-to-Be* (1948) explained that her views came from a combination of the work of Read (his ideas about relaxation) and Vaughan (for her understanding of the development of the female pelvis and the effects of exercises and postures on it), and her inspiration from fellow physiotherapist Minnie Randell (p. v). Heardman also drew on a sporting analogy to describe the need to train for childbirth in order to make it safer and more pleasurable. She explained that due to lack of proper education about childbirth (a women has generally "gained what little knowledge she has from hearsay, novels, plays and the cinema"), the expectant woman:

> is practically certain to think that she is facing an ordeal by pain, if not agony, which may even endanger her life. The fact that she is to enter upon a rhythmic muscular effort which can be as painless and joyful as playing a hard set of tennis would cause her intense surprise, yet when it is put to her that a man who is to row in a boat race enters a period of very strict training beforehand, toils through the race with anything but apparent enjoyment, collapses over the oars at the end, and does it for the PLEASURE of it, she may begin to see the light. (p. 7, emphasis in original)

Having set up the sporting analogy, she then delivered her main argument:

> if a man so trains for a heavy muscular effort, how is it that we have allowed women, whose function is the reproduction of the race by muscular effort, to embark upon the heavy muscular effort of labour without even a second of real training – and in FEAR? (p. 7, emphasis in original)

Significantly, Heardman used the sport analogy not to challenge long-standing medical views about the dangers of vigorous exercise or athletics during pregnancy but rather to

construct childbirth as a monumental event (*the* event in a women's life) that if trained for, could be as pleasurable for a woman as winning a race is for a man.

The extent to which proponents of 'training for childbirth' challenged standard medical ideas regarding the physical capabilities of women in the athletic realm is unclear for ideas varied between different authors and programmes. An article entitled *Physical Activity and Maternity* (1933) written by Ivens-Knowles, a female gynecological surgeon from England, provides further insight into the issue. Ivens-Knowles, who was a proponent of Vaughan's work, explained that "obstetrical authorities in the past differ considerably in their recommendations with regard to the subject of exercise during pregnancy and on the whole do not dwell much on its importance" (p. 341). She further elaborated, noting that there are those who:

> consider that the pregnant woman should lead a very quiet life, taking only walking exercise and never to the point of fatigue, though exercises to strengthen the abdominal muscles may be recommended. All athletic exercise, such as dancing and cycling, is to be given up, though a gentle game of croquet may be permitted! (p. 341)

There is, she explained, another authority which recognizes that labour demands prolonged muscular exertion on the part of the mother – and is perhaps the hardest day's work that the average women will have to carry out. Thus:

> women who are not of the working class should be trained for labour just as men are trained for athletic competition, and during pregnancy women should have as much exercise as possible, short of actual fatigue, though it should not be violent, but rather prolonged and, if possible, should be taken in the open air. (p. 341)

Working class women, of course, were thought to have the easiest labours as "daily labour strengthens the power of muscular endurance" (p. 341) whereas "present-day civilization has introduced the sedentary worker, and household duties are so simplified that physical exercise in preparing food, the care of the house, and the provision of

clothing, has been reduced to a minimum" (p. 345). Knowles seems to suggest that pregnant women were capable of more strenuous forms of exertion than a short walk – although most of the article focused on how the activity (or lack thereof) of a woman *before* she conceived could influence her experiences of childbirth, with little in the way of prescription for pregnancy women. She did, however, express pleasure in the apparent growth in the popularity of open air games, organized walking tours and "dancing of a more strenuous character than has been prevalent of late years" as they are "all signs of a reaction towards a simpler and healthier life, and the attainment of a good physique and healthy muscles which will answer satisfactorily all the calls made upon them" (p. 348).

An article published in *Hygeia* (a publication of the AMA which changed names to *Today's Health* in 1950) called "Your 'Daily Dozen' During Pregnancy" (Sweeny, 1939) is also instructive. The author, Miriam Sweeny, positioned herself as a strong proponent of exercise during pregnancy in order to "assure good posture, circulation, elimination and muscle tone" (p. 795) also noting that "it is not necessary to make the period of pregnancy a dull one." She further explained that "the more normal [the pregnancy] is allowed to be, the better. Therefore, unless there is some reason why the doctor advises against sports and other recreational activities, it is well to enjoy them, at least through the fifth month." She provided the typical caveat to "always discuss this point with the doctor, and always use judgment regarding fatigue" (p. 795).[128] Sweeney's encouragement to engage in sport and other recreational activities was, however, unusual for this time (at least in texts written by physicians and health care providers) and

[128] Her 'daily dozen' consisted of floor exercises (to be performed on a thick mattress or in bed) as "exercises done off the feet will be far more beneficial than any done in the standing position as many foot troubles are started at this time by overstraining relaxed foot musculature" (p. 795). She then offered several exercises to help women 'train for childbirth.'

foreshadowed the shift in discourse which would occur about three decades later.[129] Ivens-Knowle's (1933) discussion as well as the article by Sweeny (1939) provides evidence to suggest that there was an alternative discourse circulating with respect to appropriate exercise during pregnant that did not receive 'mainstream' coverage.

At the same time, it appears that other 'training for childbirth' proponents expressed concerns in line with the traditional medical establishment. Randell (1933) warned against 'too violent exercise' explaining that "the mother should avoid heavy lifting, especially entailing sudden or severe straining efforts, or anything which may jar her body, as abortion [miscarriage] is sometimes caused in this way" (p. 271). Moreover, when describing her two types of training exercises (training for relaxation and training special muscles groups), she explained that:

> these two types of training will be found to inculcate a form of discipline which will be invaluable to the obstetrician, and to the midwife, as the patient will have been trained to obey instructions when the time comes, thus playing an important part in obtaining a natural childbirth. (p. 271)

Thus, not only did Randell share the traditional medical viewpoint as to the possible causes of miscarriage (which dramatically limited women's activities while pregnant) but she touted her own exercise routine as a way to instill discipline in women, allowing the members of the medical profession a greater degree of control. While it is likely that she emphasized the discipline-instilling aspects of the exercise programme as a way to gain acceptance from the wider medical profession, framing it in this way did little to trouble existing power relations. In her book, *The New Childbirth*, Wright (1964) also warned women against exertion as she considered this as leading to a danger of high blood

[129] Sweeny also placed an emphasis on the aesthetic benefits of exercise during pregnancy, an early indicator of the emphasis on the 'yummy mummy' that has become so prominent in contemporary western society.

pressure and Dick Read included rotatory movements among his taboos (Hamilton, 1958). In a 1958 interview published in *Chatelaine*, he also tried to distance himself from any association with the gymnastics or calisthenics commonly associated with 'training for childbirth.' He acknowledged that gymnastics used to be part of the programme but were dropped because "a few simple exercises designed to help correct breathing and postures are enough" and he went on to explain that:

> the early days of physiotherapy did a good deal of harm and most of the exercises we had thought necessary were not beneficial...Here in Canada, though, and in some parts of the United States, gymnastic preparation is still being used to a greater extent than we think is desirable or helpful. (Hamilton, 1958, p. 28)[130]

Despite coupling the terms 'athletics' and 'pregnancy' through the use of such phrases as 'training for childbirth' and 'childbirth as an athletic feat,' it appears that many proponents of 'training for childbirth' (and the natural childbirth movement) did not challenge standard medical guidelines regarding appropriate exercise during pregnancy. That is to say, they assigned greater importance to the act of toning/preparing the muscles used in childbirth than the traditional medical profession but their ideas regarding what was 'safe' versus 'dangerous' were largely grounded in nineteenth century medical ways of viewing the pregnant body. Nor did they challenge societal 'norms' regarding women's roles in society (as mothers and guardians of the race) and in fact, their calls to train for childbirth were intended to make birth a more pleasurable experience for women so that they might be encouraged to fulfill and more fully experience their maternal destiny. Heardman's (1948) book began with the lines:

> The most important biological function of Woman is the reproduction of the race. Nature leads her to this crown of her womanhood by the pleasant and lovely ways

[130] It is possible that the removal of the gymnastics exercises from Dick Read's programme was part of the effort to become accepted by the mainstream medical profession. Gymnastic exercises (performed to music) were central to the programmes of Minnie Randell and Kathleen Vaughan (see Heardman, 1948, v).

> of courtship and marriage. Surely the ultimate plan cannot be the delivery of the child...in pain and anguish. These pages therefore, set forth one method of preparing women to experience, in full, the happiness which is their right. (p. 1)

Other proponents of training for childbirth further reinforced women's social roles by presenting ways to incorporate "ordinary housework" into their training exercises (Heardman, 1948; Madders, 1958; Randell, 1939).[131]

While the training for childbirth movement may not have been controversial with respect to appropriate exertion levels for women and reinforced women's ultimate role as mothers,[132] it posed a challenge to physician's control over the actual birth experience as the training exercises were intended to help women to take greater control over the birthing process. The idea that women give birth in positions other than the supine (e.g., crouch when giving birth) or that women avoid using drugs/anaesthetics countered the practices that obstetricians had established as the norm over the first several decades of the twentieth century (Arney, 1982; Sandelowski, 1984). In the early years of the training for childbirth (natural childbirth) movement, advocates were often not taken seriously by the mainstream medical profession, likely due in part to the mystical quality of some of their work (for example, performing exercises to music – exercises not 'proven' through scientific enquiry to even be effective).

The methods or techniques that did become accepted (namely the work of Grantly Dick Read) had to conform to more mainstream medical ideas in order to gain acceptance

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[131] One of the exercises outlined by Heardman (1948) is titled "polishing the floor on hands and knees" (p. 18) and in her short instructional booklet for mothers entitled "Before and After Childbirth: Exercises and Relaxation," Jane Madders (1958) outlines both relaxation exercises (for use in labour and general well-being) and exercises that will help to prepare the joints and muscles for labour. She explains that "many of these are hardly exercises, but natural postures which can be used while doing housework" (p. 6).

[132] In her discussion of natural childbirth in America, Sandelowski (1984) suggests that one of the reasons that natural childbirth became more mainstream was the demand from women who, in the post war years of the feminine mystique, felt unfulfilled when they could not fully experience and/or remember childbirth, an event that was positioned as a woman's ultimate life event.

(Kitzinger, 1990; Sandelowski, 1984) – as evidenced by the way that Randell (1933) positioned her exercise programme as a way to 'inculcate a form of discipline' and Vaughan's (1951) previously mentioned warning to "remember you must co-operate with your doctor and nurse. Do just as they wish" (p. 35).[133] In her discussion of natural childbirth in Britain, Kitzinger (1990) explains that in the struggle to have natural childbirth accepted as mainstream, the concept or practice lost much of its women-centred approach. She describes how one central women's group, the National Childbirth Trust (who were originally proponents of the work of Grantly Dick Read and then Lamaze), attempted to fit natural childbirth into the existing system by 'wooing' the professionals – doctors (p. 100).[134] She argues that:

> far from explicitly challenging medical power, the NCT appealed to doctors' paternalism, asking them to be more indulgent of women at a time of particular vulnerability [and let them practice natural childbirth]...Thus, the NCT's campaign for the more humane treatment of women drew on and reinforced mainstream values of male chivalry, doctors' paternalism and female weakness. (p. 105)[135]

Sandelowski explains that the concept of natural childbirth was also altered in the United States as obstetricians and obstetrical nurses were not prepared by education or training to conduct childbirth as if it were a normal and painless event (and given the actual labour room setup and practices, could not do so even if they agreed with the ideological

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[133] Kitzinger (1990) notes that in the first half of the twentieth century, birth was viewed as a private if not shameful and animalistic act, with doctors and midwives being the only ones needing to know the details. This led to a monopoly of the medical profession over childbirth which was reinforced by women's demands for hospital births and anesthetics to help combat maternal mortality and the pain of birth. Thus, proponents of natural childbirth had to battle not only the disdain of the medical profession (who viewed the new technique as an encroachment on newly gained power over childbirth) but had to reeducate the general public about 'birth' and disassociate it with pain/shame (i.e., make it seem like a natural experience).

[134] The NCT were originally called the Natural Childbirth Association but changed their name in 1961 in an attempt to change their image and became more widely accepted.

[135] Indeed, when describing her two types of training exercises (training for relaxation and training special muscles groups), Randell (1933) explains that "these two types of training will be found to inculcate a form of discipline which will be invaluable to the obstetrician, and to the midwife, as the patient will have been trained to obey instructions when the time comes, thus playing an important part in obtaining a natural childbirth" (p. 271).

underpinnings of natural childbirth). The result was that natural childbirth proponents downplayed the rhetoric of trying to achieve a painless (and drug free) birth and instead emphasized the *pleasure* that women could derive from using the natural childbirth method. It would allow females to fully experience - and actually remember - the most important event of their lives, an argument that was aligned with the pronatalist emphasis of the post WWII years.

This brief examination of the 'training for childbirth' discourse reveals the complexity of the discursive field of power relations. Discourses that one might be tempted to frame as 'counter' discourses appear to both complement *and* counter traditional medical views of the female body. Indeed, Foucault warned against thinking of discourse in such binary terms as accepted/excluded or dominant/dominated, "but as a multiplicity of discursive elements that can come into play in various strategies" (1990, p. 100). He further argued that:

> Discourses are tactical elements or blocks operating in the field of force relations; there can exist different and even contradictory discourses within the same strategy; they can, on the contrary, circulate without changing their form from one strategy to another, opposing strategy...we must not expect the discourses on sex [or another issue] to tell us...what strategy they derive from, or what moral divisions they accompany, or what ideology – dominant or dominated – they represent. (p. 101-102)

While perhaps not challenging ideas regarding women in the sporting realm or in various social roles, the training for childbirth or natural childbirth discourses did represent "a hindrance, a stumbling-block, a point of resistance and a starting point for an opposing strategy" (Foucault, 1990). To be sure, natural childbirth became a central issue that second wave feminists rallied around in the 1970s as women fought to control their

reproductive rights, and Kitzinger explains that it was in these years that childbirth activists finally began to empower women with choice and control over birth.[136]

Athletics and Pregnancy: Sporting Moms

In this section, I move away from the field of obstetrics and examine the discourses about the female sporting body circulating in the realm of sports medicine. While physicians had commented on sports, fitness and the body for many years, 'sport' was not established as a subspecialty of medicine until the years following WWII (Beamish & Ritchie, 2006; Safai, 2007).[137] Safai (2007) notes that the first significant sport medicine development in the United States (and to a certain extent Canada) occurred in 1954 with the founding of the American College of Sports Medicine (ACSM) (p. 337). While interest in organized sport medicine in Canada emerged as early as the mid 1940s, it was not until 1966 that a Canadian entity, the Canadian Association of Sport Sciences (CASS) - now known as CSEP - was created.[138]

One area of interest in the growing field of sport medicine was women's athletics. Attention to the topic of exercise and female reproductive functions was, of course, not new having been the object of medical discourse since the late nineteenth century

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[136] Other scholars have illustrated the complexity of the issue. Wetterberg (2004), for instance, has critiqued the 'natural' childbirth movement for becoming too militant in the other direction and also pointed out how, in gaining control of pregnancy and childbirth, women are held solely responsible for a safe outcome. Similarly, Arney (1982) argues that physicians integrated natural childbirth into their practices in such a way as to maintain a semblance of control over childbirth, in large part by instilling women with the disciplinary techniques of self-surveillance.

[137] The rise in sport medicine was driven by/tied to the ethos of excellence in sport which arose in the post WWII (Cold War) era (with Eastern Bloc countries leading the way and pushing the Western world to compete). Sport medicine emerged as tool to improve athlete's performance, as well as to ensure the health of athletes (Beamish & Ritchie, 2006; Safai, 2007).

[138] In the mid 1940s, but especially during the 1950s, there was discussion of Canada joining the FIMS (Federation Internationale de Medicine du Sport), the international sport medicine organization that had its roots at the 1928 winter Olympics and is still affiliated with the IOC (Safai, 2007). Overall, North America lagged behind Europe in its development of sport medicine where scientific knowledge was being used to pursue athletic success by the early to mid-twentieth century – a shift from the nineteenth century trend towards using the athletic body mainly to pursue scientific knowledge (Berryman & Park, 1992).

onwards (Lenskyj, 1983; Vertinsky, 1994). A shift was occurring, however, and the advice became less restrictive, with some sports medicine physicians questioning and even critiquing longstanding beliefs about the dangers of vigorous exercise (Jokl, 1957; Ryde, 1956).[139] Ernst Jokl (1957) (a founder of sports medicine in Germany, South Africa and the United States) even linked his critique to feminist arguments that women's subordinate status in relation to men was not a result of natural feminine characteristics but rather the result of unequal educational and sporting opportunities. Indeed, by the 1950s it was increasingly accepted within medical circles that girls and women were capable of enduring more vigorous exercise – and even highly competitive sport – without negative long terms effects on women's reproductive organs (Hall, 2002).

The growing acceptance of sportswomen was likely tied to an expanding body of data collected by physicians who were studying the impact of participation in high level sport (including the Olympic Games) on the menstrual and reproductive functions of the athletes. Data was typically in the form of athlete surveys, interviews with athletes and physicians as well as the evaluation of menstrual charts and pelvic/rectal examinations. It was generally concluded that competitive exercise during menstruation was relatively safe, that menstruation did not negatively impact athletic performance and that exercise prior to pregnancy did not lead to complications during pregnancy or childbirth - and in some cases that elite athletes had faster labours (Erdelyi, 1962; Jokl, 1955; 1957; Ryde, 1956; Zaharieva, 1965). Ironically, then, it was women's resistance to medical advice warning them *not* to participate in strenuous activities that prompted the collection of data

[139] While it was commonly thought that the female body was incompatible with more rigorous activities in the first half of the twentieth century, some physicians such as Agnette Parry (1912) and Clelia Mosher (see Mosher & Martin, 1919) had challenged the idea that females are incapable of more strenuous forms of exertion, especially during menstruation.

that was then used to 'confirm' that these very activities were not as damaging as once thought. Social practices were thus slowly changing and reshaping the meanings attached to the female sporting body – although as Hall (2002) reminds us, women were directed into 'feminine' sports such as figure skating and their good looks and femininity were often the focus of attention in media coverage.

The interest by the North American sports medicine profession on the female athlete was likely also prompted by the efforts of their European counterparts who had shown an interest in women's sports since the 1930s (Lenskyj, 1983). Many of the North American reviews of literature cited studies conducted in the European context and in an editorial note prefacing an article by Ernst Jokl (1955), it was observed that:

> The increasing interest shown in Europe, especially in the Scandinavian countries, Poland, Czechoslovakia, Hungary and Russia in physical education and competitive athletics for women raises a number of special physiological and clinical problems which Dr. Jokl will discuss in a number of articles of which this is the first. (1955, p. 48)

As the above quote suggests, physicians may have been more optimistic about the reproductive future of the sportswoman but in light of new knowledge emerging from Europe, felt that it was necessary to weigh in on the debate regarding 'how much and how far.'

Despite the growing acceptance of girls' and women's participation in sport (albeit with continued concerns and caveats), the notion of mothers – especially pregnant women - engaging in competition (particularly at high levels) met with continued resistance. For instance, while I noticed some examples in which the popular advice was slightly less restrictive (in both the 1953 and 1960 editions of the *Canadian Mother and Child*, the reader is advised that she can swim, golf, dance, skate or go for walks if she is

used to these activities and performs them in moderation), little changed with respect to ideas regarding more strenuous forms of exercise. In the Canadian government texts, for instance, women were told not to start any new strenuous activity, not to carry on any activity for too long and also told that certain activities should be stopped because of the risk of falls or injuries, including skiing, diving and tobogganing (p. 24). Similarly, the British physician, Ryde (1956), who was more progressive in his views regarding exercise for girls and women, remained conservative about exercise during pregnancy. He explained that:

> it has been reported in the sports press of recent years that Mrs. L. played tennis until the day her child was born, that Mrs. W. played county hockey until her fifth month of pregnancy and only stopped then because the season finished, whilst Mrs. J. won a bronze medal for diving at the 1952 Olympic Games when her child was well on the way. These, of course, are exceptions, but pregnant women should give up games in the second and third trimesters. (p. 75-6)

Thus, while Ryde took a less conservative and even progressive stance with respect to women/girls and athletics, concerns about the pregnant body remained. He went on to explain that the notion that women should refrain from exertion while pregnant "is not exactly a new opinion" and cited the work of Louise Bourgeois (who officiated the birth of the French King Louis XIII in the early seventeenth century) who:

> disapproved of the then current teaching that 'a woman seven months gone ought to walk very much'. Her view was that exercise at this time would allow the child to turn round into a possibly unfavourable presentation, would 'dilate the belly', drag down the womb and bruise the child's head against the bones of the mother's pelvis. (p. 76)

His readiness to rely upon seventeenth century beliefs about the dangers of overexertion in pregnancy as opposed to observations that pregnant women were competing in Olympic Games without any negative outcomes speaks to the tenacity of ideas regarding appropriate exercise for pregnant women. The Amateur American Athletic Union

(AAAU) (1953) took a similar position in its report, expressing caution about "horse-riding and high-jumping in pregnancy, mainly on account of the risk of malposition" (cited in Ryde, 1956, p. 76). This was the organization's official position despite the fact that in the athletes surveyed and studied "no record was obtained of harmful effects to the offspring" (AAAU, 1953; cited in Ryde, 1956, p. 76). In an extensive review of data on the gynecological condition of female athletes which aimed to dispel many 'myths' about the dangers of exercise on women's bodies, Erdelyi (1962) included data from his own examination of the pregnancies and deliveries of 172 female athletes), noting that he found fewer complications of pregnancy, especially toxemia in athletes (2.19%) compared to the control group of non-athletes (4.4%). Erdelyi concluded that "threatened abortions (6.5% in athletes) did not reach the usual average and could not be associated with sports since most of them stopped their sports activities as soon as their pregnancies were determined" (p. 177). In spite of this finding, he advised that continued caution was the most appropriate measure:

> However two-thirds of all my cases continued their sports activities during the first 3 or 4 months of their pregnancies. Although I could not prove any harmful effect of sports on pregnancy, I believe we should not generally approve competitive sports during pregnancy. We must judge each case individually. (p. 177)

The social climate following WWII provides context for the exercise advice provided to pregnant women, perhaps helping to explain why it changed so little – despite the fact that there were instances of women with children and pregnant women engaging in rigorous exercise typically considered 'taboo' with no apparent negative effects on their reproductive outcomes (Hall, 2002; Jarvis, 2003). Hall (2002) explains that in Canada, even the role that women played in WWII (taking over 'male' jobs in munition plants or even facing physical danger in war zones of Britain and Europe) "did little to

change attitudes towards mothers competing" (p. 120). In fact, many feminists have argued that it was precisely women's role in 'male' jobs during the war that provided the impetus for postwar efforts to re-inscribe women into the domestic realm as wives and mothers and/or into lower paying (pink) jobs, all in an attempt to restore the 'normal' gender order (Arnup, 1994; Keshen, 2002; Porter, 2003; Roach Pierson, 1986; Strong-Boag, 2002). Arnup (1994) and Kline (2001) argue that post WWII was the most intense period of pronatalism in both Canada and the US. The Canadian government, for instance, implemented a number of new policies which reversed many of the wartime policies designed to encourage women to enter the labour force.[140] The mass media, especially women's magazines, also played a central role in efforts to re-establish the social order of the time, inundating women with an "unprecedented barrage of advice linking their identity to their roles as mothers and offering dire forecasts about those who failed to embrace their place in the child-centred nuclear family" (Strong-Boag, 2002, p. 314; see also Freidan, 2001; Korinek, 2005).[141]

By the mid 1960s, however, there was evidence of a slight shift in medical discourse regarding exercise, especially more strenuous forms of exercise. While I cannot assert anything close to causality, it may be that the open resistance displayed by female athletes who continued to participate and compete in sport events while pregnant (with no

[140] Amongst these new policies were the closure of government run daycares and nurseries, the renewal of civil service regulations which prevented married women from working for the federal government, the reversal of tax incentives set up in the war years to encourage married women to work for pay as well as the implementation of UI benefits that discriminated against women and were based on the assumption that their work was in the home (Keshen, 2002; Porter, 2003).

[141] There is some debate amongst scholars with respect to the impact of the war on women's social roles. Roach Pierson (1977; 1986), for instance, argues that WWII did not challenge the traditional gender order and advance women's struggle for equal status with men. Others offer a more nuanced analysis of the post-war years (see Keshen, 2002; Korinek, 2005). Keshen (2002), for example, notes that "undoubtedly, transformations in the daily lives of so many women during World War II raised widely reported fears over social instability, and ultimately helped strengthen a post-war conservative reaction; but it also appears that too much had transpired for too many women to permit things to return to the *status quo ante bellum*" (p. 251).

apparent harm) provided the impetus for doctors to start to question the long standing advice, in much the same way as occurred with non-pregnant elite athletes. The questioning by physicians was gradual however. The text *Sports Medicine* (1962) by J.G.P. Williams (considered by Jokl to be "the first British treatise on sportsmedicine") contained a short paragraph on exercise during pregnancy in which he explained that "practically all obstetricians would agree that there is no place for violent exercise and competition during pregnancy. Gentle exercise is certainly desirable and can satisfactorily take the form of running and swimming" (p. 406).[142] While the idea that 'gentle exercise is desirable' was not new, the notion that running was a gentle and acceptable form of exercise for pregnant women was most certainly a deviation from traditional medical opinion.[143] However, in line with earlier ideas regarding pregnancy, Williams explained that "more strenuous activities such as jumping, throwing and riding are best avoided" but weighed in on the longstanding debate regarding the impact of athletics on labour asserting that "all the evidence suggests that the course of labour in athletes is generally smoother and easier than in the normal population" (p. 406). In a later 1965 book, *Medical Aspects of Sport and Physical Fitness*, Williams also included a brief excerpt on prenatal exercise, asserting that:

> Physical activity of any degree of violence is generally agreed to be contra-indicated during the course of pregnancy although there are of course numerous instances where pregnant women have engaged in violent exercise both sporting and otherwise and had an uneventful pregnancy and safe delivery. (p. 66)

He commented no further on the seeming contradiction.

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[142] Interestingly, this information was located in the last paragraph of the book giving the impression that it was an 'afterthought.'

[143] Williams cited two articles in European research journals from the 1950s (Rummpf, 1952; Kiss, Endelyi & Iffy, 1957), so it is possible that notions of appropriate exercise during pregnancy differed in Europe.

Another popular text (according to Jokl) was *Sports Medicine for Trainers* (1963) written by US physiologists Laurence Morehouse and Philip Rasch of California and it also included a short section on pregnancy and athletics. Notably, the authors did not assert their own opinions on the topic but rather referred the opinions of others. They explained that:

> as a safety precaution, pregnant athletes are usually barred from competition. However, a platform diver placed third in the 1952 Olympic Games while three and a half months pregnant. Another pregnant athlete was on the skiing team. Both subsequent births were uneventful. At the 1956 Olympic Games three of the women competitors – a shot putter, a discuss thrower, and a sprinter – were pregnant. Numerous other examples of women winning championships while pregnant have been recorded. (p. 43)

Despite presenting evidence that women competed at high levels without negative outcomes, the authors then cited Ryde's recommendation that a pregnant woman should forgo competition in the second and third trimester and explained that "the authors of the Amateur Athletic Union study urged caution in horseback riding, high-jumping and skating while pregnant because a fall might result in malposition of the fetus" (p. 43). Morehouse and Rasch did not comment any further on the impact of sport on pregnancy, and while not stated explicitly, their review of the literature seems to imply that the evidence barring women from athletics while pregnant was weak.

Dr. Michael Bruser, a Canadian physician from Winnipeg, was more outspoken in an editorial entitled "Sporting Activities During Pregnancy" which appeared in the November 1968 edition of *Obstetrics and Gynecology* and was something of a polemic against traditional medical ideas regarding exercise during pregnancy. Bruser began his editorial by calling into question the vagueness of typical guidelines, observing that "[t]extbooks have little to say about the topic of sporting activities during pregnancy

beyond stressing the need for caution and for common sense – yet there can be no precise definition of the phrase 'common sense'" (p. 721). He cited the guidelines provided by Browne & Browne (1955), a standard obstetrics text at the time:

> All violent exercise, such as tennis, riding, cycling, or swimming, should be avoided during the last six months. Speaking generally, the amount of exercise should be regulated by the patient's own feelings, and should always stop short of fatigue. (Browne & Browne, 1955, cited in Bruser, p. 721)

In his assessment of these guidelines, he pointed out that none of these activities need be violent and further critiqued the liberal use of the vague term 'fatigue' asking "and what does fatigue mean?" He argued that studies of fatigue during pregnancy are limited and asserted that it has never been proven that fatigue is harmful. In fact, he argued, one would think that fatigue from housework (an acceptable activity) is just as harmful as fatigue created by sporting activities – yet "every day we hear the pregnant patient complain of fatigue" with no adverse consequences. Bruser also pointed to the illogic of texts which suggest that physical activity to any degree of violence is 'contraindicated' during pregnancy, yet in the next sentence cites a list of women athletes who competed in the Olympic games with no adverse effect on the progression of pregnancy or fetus. He explained "in fact, most women athletes continue their activities for some time before discovering their condition, and most of their pregnancies progress normally. The incidence of miscarriage is not known to be greater among athletes" (p. 722).[144] He looked to European research to substantiate his critique of conservative notions about pregnancy and sport. Referring to a 1961 report from a German sports school, he explained that the physicians there had learned to allow all sports during pregnancy

[144] He does acknowledge that pubic bone alteration sometimes occurs in pregnancy - which can be quite painful and precludes most activities, even walking (p. 723).

except those accompanied by bumping and compression. Bruser also cited a collaborative project carried out by a Bulgarian and a Spanish researcher (Zakharieva and Sigler, 1963) in which the authors studied 207 well-trained athletes with up to 4 children – 70% of whom continued their athletic activities until the sixth month of pregnancy (with some even competing) – and concluded that pregnancy and sports are compatible, that sports lead to better labour and that early resumption of the sport is advisable" (p. 723).

Bruser further suggested that it has generally been considered that a large number of conditions (such as abortion, premature labor, abruption placentae and others) may occur spontaneously without physical activity or stress being a major factor in their production, and "unless and until it is proved that any of these conditions occurs as a result of physical activity, it would appear to be an exercise in timidity to disallow such physical activity through fear of such events" (p. 724). He argued that while common sense must be implied:

> surely we can allow much greater activity than has been considered proper up to now. Specific sports should be considered in relation to two questions: Is the patient physically fit and accustomed to this sport; and, secondly, is it likely that there will be 'bumping and compression'? (ibid.)

Bruser acknowledged that pregnant women may need to cease competition in the advanced stages of pregnancy since these situations call for maximum effort and since changes in balance and weakened pelvic structures might cause difficulties.

The questions being asked by Bruser (and the researchers that he cited) represent a disruption of what Fleck called 'thought circles'; after years of thinking about the pregnant body as incapable of more rigorous levels of exertion – especially in the sporting realm - individuals were beginning to question these long-held assumptions. It appears that (similar to the case with non-pregnant women), the actions or practices of

pregnant athletes may have provided the impetus for this shift in thinking; by continuing to perform at high levels – with no apparent negative outcomes – these women challenged ideas about the limitations of the pregnant body. The very act of engaging in such resistant practices represented an alternative discourse to the commonly accepted medical statements of the time. Although it took some time (and would later be challenged throughout the 1980s) some physicians/body experts also took up this discourse, investigating it further through their research and writing about it in medical journals. A fissure or break in the way of thinking about the pregnant body, physical activity and sport had begun to appear.

This is not to say that previous ideas were completely discarded. In a 1964 article entitled "Education of the Pregnant Woman" published in the *British Medical Journal*, Dr. Brown asserted that "the best exercise is regularized and sensibly planned housework, light shopping and light gardening – all the tasks in a contented housewife's day." He further stated that:

> scrubbing and polishing on hands and knees is permissible, provided it is not overdone...gentle swimming, cycling and dancing (including a gentle 'twist') may be encouraged; strenuous swimming and cycle races and dancing the jitterbug are to be strongly discouraged. Rigorous exercise such as is involved in horse-riding and sailing should be forbidden. (Brown, 1964, p. 824)

However, the alternative (sporting) discourse was increasingly evident in the late 1960s and early 1970s and likely found footing in the wider social changes that were taking place during this time, most notably the rise of second wave feminism.[145] Hall (2002) explains that in both the United States and Canada, the grassroots women's movement was an outgrowth of the leftist student movement of the mid-1960s, as female

[145] The1960s was a time of social change in North America, with civil rights and student movements - and beginning in the late1960s, a resurgence of feminist activity.

student activists met in "informal groups and shared their dissatisfaction with the treatment of women not only in the student movement, but also in the larger society" (p. 162). Many of these women split off to form their own women's rights groups, taking with them their socialist beliefs and willingness to bring about change through the use of demonstrations and consciousness-raising. Hall relates how, in 1967, the Committee on Equality for Women (an amalgamation of women's groups from Quebec and English Canada) obtained a Royal Commission to examine the status of women, "marking the beginning of the organized (second-wave) feminist movement in Canada" (Hall, 2002, p. 162). *The Report of the Royal Commission on the Status of Women in Canada* was published in 1970, outlining women's role in the economy, education, public life, the family and law, and providing a number of recommendations which gave "second wave feminism in Canada a badly needed agenda, one with the potential to transform Canadian Society" (p. 162).

One arena in which second wave feminism had a major impact was in the realm of sport. The passage of Title IX in the United States – legislation passed in 1972 which prohibited sex discrimination in federally assisted education programmes - played a significant role in providing more sporting opportunities for females at schools, colleges and universities and participation levels of women dramatically increased. Hall notes that in the Canadian context, women's sport and physical activity slowly (but eventually) became part of the feminist agenda.[146] However, while 'official' or legislated change was

[146] The initial Report, explains Hall, only contained two recommendations specific to sport and pertained to the lack of equal opportunity for girls within school sport programs. Because schools fell under provincial purview, the recommendations received little attention from the federal government.

implemented more slowly in Canada than in the US,[147] more and more girls and women were participating in sport and fitness throughout the 1970s, likely inspired and enabled by the larger feminist movement.

Also occurring in North America in the late 1960s and throughout the 1970s was the fitness boom (along with the commodification of the 'hard body' in the 1980s) (Bordo, 1993b). Dr. Kenneth Cooper is often credited with galvanizing the popular fitness boom, particularly the recognition of and interest in aerobic activity as a health benefit (see Reice, 1985; Stahmann Dilfer, 1977) with his 1968 book *Aerobics*, followed by a number of others including *New Aerobics* (1970) and *Aerobics for Women* (1972), the latter of which he co-authored with his wife, Mildred Cooper.[148] While the Coopers encouraged women's participation in fitness activities, citing improved physical appearance as the main reason to exercise (with improved health and fitness as a convenient side benefit), the women's fitness movement gained momentum in the late 1970s and 1980s with the rising popularity of celebrities such as Jane Fonda and her aerobic programmes. Women had been identified as a distinct market segment by the growing fitness industry and it grew exponentially throughout the 1980s and beyond (Bordo, 1993b).

Significant to the Canadian context, the notion that physical activity, particularly aerobic exercise, could improve one's health was seized upon by the Canadian government. The Lalonde report of 1974 was particularly influential in emphasizing the

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[147] Persistent feminist activism within the Canadian sport system resulted in the establishment of an official Women's Program within Fitness and Amateur Sport in 1980, with the mandate to "develop and promote ways of involving more women in sport and fitness activities" (as cited in Hall, 2002, p. 168). Further strengthening the position of women and sport in Canada was the creation of the Canadian Association for the Advancement of Women and Sport and Physical Education (CAAWS) in 1981.

[148] As an aside, in his chapter on women in Aerobics (1968), entitled "Mostly about Women", improving physical appearance was touted as the main benefit of aerobic exercise for women, with improved fitness and health merely fringe benefits.

importance of individual lifestyle decisions in the pursuit of health (MacNeill, 1999). Following the Second World War, the role of medicine and the notion of 'health' had shifted. In 1946, the World Health Organization broadened the meaning of 'health' to encompass a state of complete physical, mental, emotional and social well-being – as opposed to merely the absence of disease (Bolaria, 2002, p. 13). This allowed for a broader consideration of the meaning of health and the societal causes of collective health and illness. Arney (1982) asserts that it had the important effect of changing the view of the body as 'machine' to the body as an 'ecological system' (see also Sandelowski, 1984). Previously viewed as the vehicle that brought disease, the patient was now *the whole person* in a complex environment - and the physician was positioned as responsible not only for caring for this person but also attending to the social, political and economic processes that impacted the health care system to which the patients looked for care and cure. Arney (1982) explains that this was a challenge for the physician who was required to pay more attention to the *individual* at the same time that (s)he had to try to achieve harmony in the wider *social* order (or ecology). The answer, asserts Arney (1982), was "to be found inside the individual" (p. 91) and more specifically, adapting a model of self-surveillance and monitoring.[149]

The growing emphasis on personal lifestyle management advocated in the Lalonde report (1974) was thus a governmental strategy to ease the pressure on physicians. It was also a step towards solving the additional 'problems' of growing health care costs and the patient's assumption that he/she had a right to medical care (Wheatley,

[149] The emphasis on individual surveillance was likely reinforced by the rise of risk factor epidemiology in the years following WWII which, when articulated with health promotion programmes in the 1970s, resulted in a model of preventive health dedicated to the identification of 'high risk' individuals and the inculcation of personal responsibility for risk reduction (Weir, 2006, p. 58-9) – with physical activity and diet identified as two modifiable risk factors.

2005). The Canadian government implemented healthy living programmes aimed at increasing the health of the population, most notably ParticpACTION which was viewed as 'cutting edge' amongst health promotion advocates at the time. MacNeill (1999) has subsequently critiqued ParticipACTION's media representations of gendered bodies and lifestyles for being "steadfastly middle class and heterosexist" in nature and has also questioned the programme's tendency to ground meanings of 'fitness' in scientific language that privileges "both physiological measurements of health and fitness, and behavioural solutions to the 'problem' of sedentary living" (p. 216). She points to the ideology of healthism evident in ParticipACTION campaigns (i.e., the failure to acknowledge structural barriers to one's participation in health promoting activities) – and in following chapters I illustrate how this (neo-liberal) form of governance came to bear upon the active pregnant body as well.

Throughout the 1970s, it appears that there was growing sense of permissiveness with regards to appropriate activities for pregnant women on several fronts - within medical texts, government health promotion literature and the consumer culture industry. In the second edition of his book, *Sports Medicine* (1976), J.G.P. Williams, who had previously stated that "practically all obstetricians would agree that there is no place for violent exercise and competition during pregnancy" (1962, p. 406) explained that "there is no evidence that a normally established pregnancy in a fit woman is threatened by exercise at any particular level" – although women with obstetric complications may be prescribed rest at various stages of pregnancy (Williams & Sperryn, 1976, p. 223). He also asserted that "there is little doubt" that physical fitness during pregnancy contributes to an easier delivery and also cites research suggesting that athletic women, in general,

have an easier time at childbirth. In the 1979 version of the *Canadian Mother and Child*, it was explained that:

> Most of the sports you normally enjoy can be continued during pregnancy as long as you use common sense. Keep on swimming, curling, skating, etc., but avoid violent and competitive sports because your balance is not as good as usual, and falls could cause bleeding and other problems. If you do not participate in sports, at least walk outside an hour every day. Above all, do not consider yourself an invalid. Your body needs plenty of exercise each day to maintain its health and strength for pregnancy and childbirth. (Health Services and Promotion Branch, 1979, p. 69)

In addition, the book contained an entire chapter on relaxation and posture exercises for women while pregnant (in line with the growing natural childbirth movement).

The promotion of exercise during pregnancy also became increasingly prevalent within the popular (commercial) literature during the 1970s (see Bertram, 1975; Crompton & Chernov, 1975; Katch, 1978; Prudden & Sussman, 1978). Readers were advised that they could engage in cardiovascular exercise if they did not have medical complications and if they had received clearance from their obstetrician. Writing in *Glamour* magazine, Frank Katch (1978) explained that:

> several recent experiments have documented the physiological and performance response of women before, during and after their pregnancies. These results, reinforced by previous studies of pregnant Olympic athletes, demonstrate clearly that the body's response to the stress of exercise training has no negative effects during pregnancy. (p. 80)

He went on to provide the reader with a word of caution that "such findings may not apply to other apparently healthy pregnant women; be sure to consult your doctor before you embark on your own or a similar program" (p. 80) and provided some further words of encouragement: "if you're a tennis player, play tennis; cycle, run, jog, swim, dance, jump rope, or whatever you choose – but bury the myth [of the dangers of exercise] forever" (p. 80).

In his book *New Aerobics* (1970), Cooper informed the reader that a backache is one of the most common complaints a doctor hears from women post-pregnancy and he went on to cite an article published in the *Journal of the American Medical Association* in which it was reported that "lack of exercise in women 18-23 years of age was a frequent cause of backache following pregnancy" (p. 135).[150] Ideally, he explained, the pregnant woman should be in good condition before the onset of pregnancy, but "she can start into an exercise programme during pregnancy, if she consults her obstetrician" (p. 135) as she may have a condition what would make exercise inadvisable. Given medical clearance, however, he asserted that "normally it is possible for women to continue their regular aerobic exercise programme up to the sixth month of pregnancy" (ibid.). He suggested that in the last trimester exercise should be less strenuous, although he noted that there are "exceptions to every rule":

> One of my correspondents...kept right on jogging throughout her pregnancy. "Even during the ninth month," she writes, "I kept up my daily routine. A 12 minute morning jog, and another 12 minutes jogging late in the evening. All with my obstetrician's approval, of course...The [previously planned] Caesarian section was not necessary and due to the jogging, I still have my waistline and a flat tummy – not the deflated beach ball I thought I'd end up with". (p. 135)

In some instances, the call to be physically active while pregnant was overtly linked to the women's movement. Carol Stahmann Dilpher (1977) wrote a book called *Your Body, Your Pregnancy* which was an extension of an exercise programme she had created which was designed to help women feel and look better during and after pregnancy. The title of the book appears to play off of *Our Bodies, Ourselves* (1973), a book written by a group of feminist activists in Boston that is now synonymous with the women's health movement, and in it Dilpher set out to counter the idea that women

[150] While Cooper did not provide a full citation of the article (he only provided the journal name), I believe that the article he referred to is "Pregnancy, Fitness, and Sports" by Gendel (1967).

cannot exercise while pregnant.[151] In the first chapter entitled "Of course you can exercise during pregnancy" she took to task the notion of the pregnant body as incongruous with exercise:

> How many times have you heard that pregnant women should take it easy – relax, read a lot, sit down most of the day? Or that pregnant women should not bend over (that might squash the baby). or not stretch their arms above their heads (never can tell when the baby might strangle on its own umbilical cord). Or, for heaven's sake, never do such strenuous things as take walks or ride a bike or play tennis. Plenty of times? Me too. But to all of that I say...HORSEFEATHERS! (p. 1)

One of the aims of her book was to help women understand how and why their bodies work the way they do and in the book she explained (in some depth) the impact of aerobic exercise on the body, the exercise-related bodily changes that occur during pregnancy, and the changes that occur to the breast, circulatory system and the changing relationship between the abdomen and lower back.[152] The feminist magazine, *Ms,* featured a story in 1978 entitled "Who says athletes can't be pregnant?" The bold title was followed by the subheading: "You can – and should – swim, run, jog, row, exercise, cycle, skate and play tennis, squash, volleyball, soccer, softball, basketball, field hockey..." (p. 47). The cover page of the article featured photos of active, pregnant women with descriptive subheadings such as: "Georgia Myers...six months pregnant...a teacher [who] plays three sets of doubles a week, and weather permitting, rides her bike eight to 10 miles three times a week"; and "Lynn Terreri Blackstone, nine months pregnant, works full time as a programme associate for arts at the Rockefeller

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[151] As the book cover explains: "her approach to 'total fitness' during pregnancy combines calisthenics and strengthening exercises to promote muscular strength and flexibility, and aerobic exercise to increase cardiovascular efficiency, stamina, and endurance."

[152] In the foreward it was stated that "pregnant does not equal ," stressing that one of the benefits of exercise during pregnancy was not gaining too much weight and avoiding becoming one of "tomorrow's dumpy young mothers" (p. ix). While this takes away from the feminist slant of the book, it was one of the few occasions where feminine beauty was dwelled upon - as opposed to other texts such as the Cooper's books. Indeed, Dilpher's book repeatedly encouraged women to put the household chores aside and to go out and exercise to "do something nice for *you*" (p. ix).

Foundation…a marathoner (she finished 58th out of 102 women at last year's Boston marathon) she runs twice around Central Park's reservoir (three miles) every evening." In the December 1980 edition, *Chatelaine* published an article entitled "Exploding exercise myths" which began with the obvious feminist agenda:

> Throughout history, despite overwhelming evidence to the contrary, concern has been expressed about the effect of strenuous physical activity of the so-called "weaker sex". It was not until 1953, when the English author Ashley Montagu wrote *The Natural Superiority of Women*, refuting myths about the biological frailty of women, that a different view was heard. (p. 32)

The article proceeded to dispel such myths as "women who exercise may endanger their breasts and/or reproductive organs"; "pregnant women who exercise will have difficult deliveries"; "women shouldn't exercise during menstruation"; and "exercise during pregnancy can be dangerous." Views of the female body – including the pregnant body – were changing, representing a moment of rupture or discontinuity in the episteme. Yet, as I discuss in the following chapter, this shift met with further challenges from within the medical community.

Conclusion

My examination has pointed to the usefulness of studying specific practices, interactions and discourses in their wider social context in order to better understand the workings of power, counter discourses and resistance. Through my analysis I have illustrated how traditional medical views about *who* should be in control of childbirth were challenged by the 'training for childbirth' advocates, but that these points of resistance were transitory and unable to take hold as the 'training for childbirth' movement was pressed to assimilate to the more integrated and well-established traditional medical profession. This example also illustrates that discourse cannot be

viewed in binary terms such as accepted/excluded or dominant/dominated as the tactical strategies and moral positions of individuals and groups involved in the production of discourses are more complex than such binaries allow. Indeed, while the 'training for childbirth' and natural childbirth advocates challenged traditional medical ideas and statements in some respects (i.e., who should be in control of childbirth), the extent to which they disturbed notions regarding the capabilities of the female body and social roles was variable, at best.

It appears that it was women's *bodily acts* of resistance (especially high profile female athletes who continued to be active while pregnant) which eventually led some physicians to change their ideas about the capabilities of the pregnant body (and in turn, the meanings attached to it). While these acts of resistance to medical advice were only one point of resistance, they did begin to gain leverage within the wider social changes occurring during this time, namely second wave feminism and the emerging fitness movement. The former impacted the symbolic meanings attached to the female body while the latter impacted ideas around the benefits of physical activity. The result was a rupture, a shift in ways of viewing physical activity and the pregnant body as different points of resistance came together at a certain time and in a certain manner.

An overarching aim of this chapter was to build upon Foucault's ideas regarding power and resistance. While Foucault has been critiqued for failing to lay out a strategy of resistance or even offer images of subjects resisting, his conceptualization of power as ubiquitous means that there are numerous opportunities for resistance (see Best, 1997; Pickett, 2005). Through a close reading of the work of Foucault, Pickett further argues that Foucault did, in fact, provide a more concrete conceptualization of resistance as he

viewed bodies and pleasure as the rallying point for the counterattack against the deployment of normalizing knowledge by the modern power regime (p. 46).[153] Foucault did not provide a neat summary of how this might work (Pickett argues that such a globalizing meta-theory would be antithetical to his project), but in my own examination I indeed identified bodily acts (i.e., women continuing to engage in the pleasurable and/or empowering practice of exercise during pregnancy) as a tool which helped to chip away at the 'rules of formation' that had previously delimited the sayable. These acts helped to create spaces for new statements about and ways of understanding the female body – which then linked up with other changes occurring at the time (the women's movement and the fitness boom). Drawing on the work of Arney (1982), one can see how disturbances at the material level (material acts of the body) are used to bring about change at the symbolic level (the meanings attached to the female body) – and vice versa.

Thus, although Foucault did not clearly articulate a strategy for resistance (and as I discuss in the conclusion of this document, some commentators suggest that his rejection of a normative framework negates the very possibility of resistance), his ideas around the working of power (especially the ubiquitous nature of power) can be taken up usefully to help think about how resistance may unfold. Power, of course, is never static and in the following chapters, I examine the power relations surrounding the active pregnant body as exercise during pregnancy became rationalized and developed into a scientific specialty area dispensing 'authoritative' advice and prescriptions.

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[153] For Foucault, the body is the rallying point for resistance, for the body itself *is* the object of power – and revolt against dominant practices must take place at the same level. Ideological critique is insufficient for this counter attack as criticizing an institution for not living up to its own stated principles is an implicit acceptance of those principles (Pickett, 2005, p. 46).

CHAPTER SIX

The Rationalization of 'Pregnancy and Exercise' Science: Weighing the Risks and Benefits

In this chapter I examine the statements regarding exercise during pregnancy produced by the scientific and medical community since the 1980s, while attending to the professional power struggles as 'exercise and pregnancy science' developed into a specialty area bringing together the domains of sports medicine and obstetrics. The overarching aim of this chapter is to illustrate how the perceived risks (and benefits) associated with exercise during pregnancy have been influenced by the social, political and economic context within which they are produced, maintained and reproduced (Robertson, 1998, p. 155).

In what follows, I outline the chief concerns of obstetricians and exercise scientists that informed their assessments of the theoretical risks of prenatal exercise, the controversies that emerged as experts debated 'how much' and 'how far' pregnant women could safely push themselves, as well as the creation of official guidelines and knowledge by professional organizations to help women monitor and manage the risks of prenatal exercise. My primary focus is on the creation of the American guidelines which were the central focus of most of the medical journals (and popular texts) – in part because they were the first 'official' guidelines created by a prominent medical organization, the American College of Obstetricians and Gynecologists (ACOG). However, I also examine the Canadian guidelines, drawing on some of my interview data which provides further insight into both their formation and reception. The chapter concludes with a discussion of the shift in risk discourse in the early twenty-first century as health care professionals began to examine the risks of *not* engaging in moderate

exercise while pregnant. That is to say, physical *inactivity* during pregnancy has been identified as a risk factor in the development of 'maternal-fetal diseases' (such as pre-eclampsia, gestational diabetes, and obesity) and body experts are increasingly turning their attention to the role of moderate maternal exercise in the treatment and prevention of a variety of chronic health conditions in both the mother and child. Before turning to my analysis of the rationalization of 'exercise and pregnancy science,' I provide some important political and social context regarding how the (newly) active pregnant body was viewed in the 1970s and 1980s.

Contextualizing the Active Pregnant Body: Change and Uncertainty

As discussed in the previous chapter, the 1970s witnessed a significant change within the discursive field of physical activity and pregnancy. The view of the pregnant body as incompatible with anything more than gentle exercise began to be questioned within both the medical and lay community and, in conjunction with the rise of second wave feminism and the fitness boom, the meanings attached to and practices of the pregnant body began to shift. The popularity of engaging in exercise during pregnancy continued to grow throughout the 1980s. Fitness guru, Jane Fonda, created a popular workout programme (in collaboration with registered nurse Femmy DeLyser) called Jane Fonda's Pregnancy, Birth, and Recovery Programme[154] and a number of additional exercise programmes for pregnant women were marketed throughout North America with names such as 'Better Bodies Before Babies' (see Keerdoja, 1984), 'Conceptual Images' and 'Pregnagym' (see Mantell, 1984). Following the trend of the late 1970s, women's

[154] The aims of Fonda's exercise programme as stated in her book, *Jane Fonda's Workout Book for Pregnancy, Birth and Recovery* (DeLyser & Fonda, 1982), were threefold: to build strength, endurance and flexibility; to help ease common pregnancy-related discomforts (i.e., lower back pain, leg cramps, hemorroids, varicose veins); and to prepare mind and body for labor (i.e, train for birth).

magazines continued to present articles on prenatal exercise. *Redbook* (Straley, 1981), *Chatelaine* ("Jane Fonda's Workout," 1983) and *Parents* (Hart, 1983) all featured exercises from Fonda's workout, and in its "Your Pregnancy" section, *Glamour* magazine intermittently published short (calisthenic) workouts created by fitness experts who were part of the growing pregnancy fitness industry (see MacCallum, February 1981; March 1985; August 1985).[155] Articles promoting the benefits of aerobic exercise (such as jogging and cycling) and providing medical opinions on how to do so safely were also featured in *Parents* (Panter, September 1981; Cole & Laibson, February 1983), *Glamour* (Gordon, May 1982) and *Women's Sport and Fitness* (Mantell, June 1984), among others. And it was not only the fitness industry promoting prenatal exercise. As part of its larger *ParticipACTION* initiative, of which a central aim was to teach Canadians to take responsibility for their health by engaging in positive lifestyle behaviours (including daily moderate exercise), the Canadian government published a book called *Fitness and Pregnancy* (1983). The book encouraged pregnant women to maintain at least their pre-pregnant fitness levels through a combination of aerobic and muscle toning/stretching exercises.[156]

The promotion of calisthenic and muscle toning exercises for pregnant women (with an emphasis on building abdominal/pelvic strength and flexibility to help to 'train' for birth) had been around for many years but participation in more vigorous programmes that stimulated the cardiovascular system was, of course, antithetical to years of advice

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[155] In addition to the goals of Fonda's programme (which were shared by many of the other fitness programmes), one of the purported benefits of the pregnancy workouts was aesthetic: looking better during pregnancy and recovering one's pre-pregnancy figure more quickly. For instance, the May 1984 edition of *Redbook* featured an article called "10 Keep-Your-Figure-Exercises" for pregnant women (see also Hart, 1983, p. 84 in *Parents*).

[156] In the introduction to the book it was stated that "In particular, by promoting fitness to pregnant women, Fitness Canada is hoping to instill the importance of active lifestyles in women who in turn will pass these attitudes on to their children" (p. 2).

provided to pregnant women by the medical profession. Some health care professionals as well as pregnant women questioned the safety of aerobic exercise during pregnancy and wondered exactly how much was prudent – if at all. Fitness programmes being marketed to pregnant women were also critiqued by some within the scientific community as being unsafe, created by 'nonprofessionals' who lacked the scientific knowledge to fully understand the risks involved in prenatal exercise (see ACOG, 1985; Wolfe et al., 1989a). Also questioned was the enthusiasm for prenatal exercise expressed in the Fitness Canada text *Fitness and Pregnancy* (1983). The text asserted that the benefits of fitness "far outweigh the traditional view that the pregnant woman should 'stay off her feet' to avoid injuring herself or her baby" (p. 3)[157] leading Bagnall, Mottola and McFadden (1983) of the University of Alberta to counter that "a review of the literature reveals little information concerned with the effects of this exercise during pregnancy on both the mother or on the developing fetus" (p. 254-5).[158]

Fueling concern about appropriate levels of exercise during pregnancy was the reconfiguration of medical and lay knowledge about pregnancy that was occurring in the latter half of the twentieth century. As noted previously, Weir (2006) asserts that the creation of the concept of 'perinatal mortality' (death before, during and after birth) in the late 1950s first troubled the idea that life begins at birth, marking a shift in the status of

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[157] In *Fitness and Pregnancy*, the reader is told that the benefits of prenatal exercise included: a more efficient circulatory system (which nourishes your baby); increased energy and less fatigue; improved abdominal strength which would reduce back pain but may also assist in labour and delivery as "you are better able to cope with the whole experience"; ease of discomforts of pregnancy (backaches, varicose veins, constipation and extreme weight gain); quicker recover of one's pre-pregnancy figure (1983, p. 3).
[158] *Fitness and Pregnancy: Leader's Manual* was produced by Fitness Canada (1983b) because there was little consistency in existing prenatal exercise classes with respect to class design, types of exercise, and exercise precautions. In other words, the organization wanted to standardize training for fitness leaders to ensure some continuity across classes as well as increased awareness of safety issues, suggesting that despite the promotion of prenatal exercise, there was concern within the Canadian fitness community about its safety.

the fetus and a re-direction of biopolitical strategies toward ensuring the well-being of the fetus (as opposed to maternal health). Other feminist scholars have illustrated how this change in the status of the fetus (and the maternal-fetal relationship, more generally) was reinforced by the events of the following decades. Armstrong (2003), for instance, discusses how the 'reproductive revolution' - which began in the late 1960s with the approval of birth control and led to the abortion debates of the 1970s - repositioned reproduction as a 'choice' and the mother and fetus as separate entities, even adversaries. In the context of the women's movement, then, the pregnant woman began to be perceived as a threat to the fetus due to her growing control over her body and reproductive decisions. Adding to this, technological advances in fetal imaging and assessment (such as amniocentisis, ultrasonagraphy and fetal monitoring) meant that the fetus could literally be seen, monitored, and tested and was more firmly established as a patient in its own right, with needs separate from (and often placed above) those of the mother (Armstrong, 2003; Lee & Jackson, 2002; Wetterberg, 2004). The result of these social and techno-medical changes, argues Wetterberg (2004), was that from the 1970s onwards the pregnant women has been constructed as predominantly responsible for and the main risk factor in fetal outcomes. While the pregnant body had been the target of biopolitical interventions since the late nineteenth century, the changing maternal-fetal relationship meant that the apparatus of governance surrounding the pregnant body grew throughout the closing decades of the twentieth century with perinatal health becoming the primary target of governmental techniques and strategies.

Perhaps most relevant to these increasing anxieties around the reproductive body (and women's growing appetite for physical activity during pregnancy) was the

emergence of medical research linking women's behaviours and lifestyle during pregnancy to congenital birth defects (Armstrong, 2003).[159] In a June 1977 *Chatelaine* article entitled "Giving Your Baby the Best Start Yet," Joan Engel summarized the medical findings around congenital birth defects and provided the reader with a detailed account of a number of possible (and preventable) causes: infections during pregnancy (German measles, syphilis), drugs (certain antibiotics, epilepsy medicine, hormones), environmental toxins (latex paint, food additives), improper nutrition/insufficient weight gain, tobacco smoking and alcohol consumption (FAS). She explained that the aim of her article was not to alarm but to educate women in order to prevent "avoidable mistakes" and went on to state that:

> [w]e can begin by avoiding the trap our grandparents fell into – the error of regarding the womb as nature's perfect ivory tower – a shelter where the fetus, bathed in warm nourishing fluid, developed in a velvety darkness, protected from all ills…we know that far from being protected in a guarded nest, the fetus is helplessly trapped in a uterine prison, exposed to many maternal habits and fads. (p. 72)

One 'fad' viewed as a potential risk was prenatal exercise. In a 1979 editorial in *JAMA*, Dr. Carl Schaefer warned that marathon running might pose a teratogenic effect during early pregnancy. Citing recent studies showing an association between birth defects and episodes of maternal hyperthermia, he concluded that marathon runners who experienced sustained increases of core temperature into the 'high fever' range might also be at risk. He lamented that:

> it would be sadly ironic if the great pain and effort invested by these women in conditioning their bodies were at the same time causing tragic and irreparable malformations to their babies. Since exercise induced hyperthermia undoubtedly occurs in other sports and in certain occupations, I hope that efforts will soon be

[159] Unlike hereditary birth defects, congenital birth defects are caused by teratogens (any agent such as a virus, drug, or radiation that causes malformation of an embryo or fetus) – and are therefore said to be preventable.

> made to evaluate the teratogenic risk associated with exercise-induced hyperthermia during the various stages of pregnancy. (p. 1892)[160]

Writing in the *Canadian Journal of Applied Sport Sciences*, Bagnall et al. (1983) noted that since even a small amount of alcohol ingested by a pregnant woman leads to a decrease in fetal breathing movements and given that maternal smoking had been shown to reduce fetal body movements "[i]t is conceivable that maternal exercise can also affect the fetus by altering the transfer across the placental barrier and altering considerably the fetal environment" (p. 255-6). In addition to the longstanding concerns that excessive jarring would cause a miscarriage, exercise during pregnancy was now thought to be a potential cause of (or contributor to) birth defects.

The rise in the number of women of 'reproductive age' who were exercising (many at or above a conditioning level) and who appeared intent on continuing during pregnancy was therefore a source of anxiety to some health care providers (Clapp & Dickstein, 1984). The result was a rapid increase in research on exercise during pregnancy in the 1980s as exercise scientists and the medical profession attempted to learn more about the interaction of aerobic exercise and pregnancy so that sound advice could be provided to physicians and their patients. To illustrate this point, a PubMed

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[160] Richard Orselli, a physician from California, subsequently wrote an editorial explaining that Schaefer's letter might cause unnecessary anxiety unless certain qualifications were made (Orselli, 1980, p. 332). He pointed out that the literature cited by Schaefer showed an association between birth defects and disease-induced maternal fever – and in these cases there are "the known fetal hazards of pathogens, drugs and maternal anorexia" (ibid). He then pointed to the lack of evidence that exercise-induced hyperthermia resulted in birth defects in either humans or animal studies as well as research suggesting that sauna-induced hyperthermia (as opposed to fever-induced) was not linked with birth defects. He finally suggested that the healthier lifestyle of runners (who had lower smoking rates and healthier diets and body weight) would likely have favourable effects on the fetus. This exchange foreshadowed the debate regarding appropriate exercise during pregnancy which emerged in the following decade as researchers struggled to define acceptable limits.

search of the term 'exercise and pregnancy' yielded 8 studies from the two decade stretch of 1950-1969, 20 studies from between 1970-79, and 141 studies from 1980-90.[161]

Researchers who produced scientific knowledge about exercise during pregnancy in an attempt to delimit appropriate levels of exertion for pregnant women were not necessarily making a conscious effort to 'keep women down.' As I will discuss in the next section, many of their theoretical concerns about the dangers of exercise during pregnancy were (and are) logical and legitimate from a medical perspective. For instance, several early research studies (mostly performed on animals) suggested that theoretical risks might, in fact, exist (Clapp & Dickstein, 1984). However, as opposed to taking what Lupton (1999, p. 2) calls a 'techno-scientific' approach to risk assessment - which does not consider 'risk' as a socio-cultural phenomenon in its own right - the growing anxieties about the pregnant exerciser must be placed within the social context of the time. The growing participation of pregnant women in sports and fitness activities (both high level and recreational) was in large part a result of second wave feminism and it challenged long held notions about the physical capabilities of pregnant women. These long held notions were, of course, grounded in late nineteenth century medical opinions (and 'rules of formation') about appropriate social roles for women and mothers-to-be (Lenskyj, 1983; Verbrugge, 2002; Vertinsky, 1994). Anxieties were exacerbated by the reconfiguration of the pregnant body at a time when the expectant woman was increasingly being constructed as largely responsible for and the primary risk to the fetus

[161] Research specific to physical activity (lab-based and clinical observation) was rare in the first several decades of the twentieth century - due in part to the fact that exercise science itself was a growing field of study during these years (Verbrugge, 2002). There was a body of laboratory based research (beginning in the 1930s) on the physiological changes associated with pregnancy (i.e., changes to cardiovascular and respiratory function, joint laxity, etc) but research specific to exercise during pregnancy was scarce and those which existed were in the European context and/or were clinical studies of the pregnancy outcomes of athletes as opposed to actual laboratory studies.

(also due in part to changes brought about by the women's movement). It was in this context of change and uncertainty that the field of exercise science began to engage in a more careful examination of exercise during pregnancy with the aim of more clearly defining the limits of safety.

The Emerging Field of Exercise & Pregnancy Science: Constructing the Risks

By the early 1980s, physiologists and scientists had identified (and had a better understanding of) the adjustments occurring in the respiratory and cardiovascular systems of the pregnant woman in order to accommodate the growing fetus - although there was uncertainty as to the exact mechanisms causing some of the changes (see Artal & Wiswell, 1986; Gorski, 1985; Lotgering, Gilbert & Longo, 1984; 1985; Mullinax & Dale, 1986). These changes included: a 16-30% increase in oxygen consumption by late gestation; a 40-50% increase in ventilation (to facilitate the increase in oxygen consumption)[162]; a 40-50% increase in blood volume[163]; a 30% increase in cardiac output (the amount of blood that is pumped by the heart per minute)[164]; and a decrease in systemic vascular resistance (to accommodate the increase in blood volume/cardiac

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[162] The increase in ventilation is the result of a 40% increase in tidal volume at rest (the volume of air inspired or expired in a single breath during regular breathing) such that pregnant women breathe more deeply as opposed to more frequently (Romem & Artal, 1986, p. 64). Artal (1992) noted that the increase in ventilation occurs in order to decrease the arteriole PCO2 (tolerance to CO2 decreases in pregnancy due to hormonal changes) and the result is a mild maternal alkalosis that facilitates placental exchange and prevents fetal acidosis (p. 369).

[163] The increase in blood volume is due to an increase in plasma volume (up to 50%) and red blood cell (RBC) volume (up to 20%). The disproportionate increase has a dilutional effect and causes a drop in hematocrit – termed 'physiologic anemia.' However, the relative decrease in red cell mass does not impede oxygen distribution to the various organs as a decreased arteriovenous (A-V) difference suggests that more oxygen is carried to the tissues than is needed (Romem & Artal, 1986, p. 67). Note: A-V difference is the difference between the oxygen content of arterial blood and mixed venous blood. The value represents the extent to which oxygen is removed from the blood as it passes through the body (see http://www.answers.com/topic/arteriovenous-oxygen-difference).

[164] In the third trimester, CO becomes quite variable (and even below postpartum levels when resting in a supine position). This is thought to be caused in part by venous pooling (due to venous relaxation) and occlusion of the inferior vena cava by the enlarged uterus (when the woman is in a supine position). Changes in hemodynamics (cardiovascular changes) are significantly influenced by body position during pregnancy.

output and prevent a rise in blood pressure). It was understood that the increase in cardiac output (which reached a peak toward the end of the second trimester) was facilitated by a rise in both heart rate and stroke volume, the latter being the amount of blood pumped by the left ventricle per heart beat. In addition to the obvious biomechanical changes occurring in the pregnant body due to the increased body mass and changes to the centre of gravity and posture (lordosis), it was suggested that the release of estrogens and/or relaxin early in pregnancy caused laxity in the pelvic joint, as well as laxity in other joints of the body.

Given that physical activity influences many of the same variables as those altered during pregnancy (i.e., heart rate, ventilation rates and substrate utilization), there was concern about the possible *interactive* effects of pregnancy and exercise.[165] Mullinax and Dale (1986), for instance, reasoned that if exercise brings about physiologic alterations similar to those during pregnancy, when pregnancy and exercise were combined there would be "a doubled physiologic impact" (p. 563) – with the fetus possibly suffering the consequences. In their oft-cited review article on exercise and pregnancy in the *American Journal of Obstetrics and Gynecology*, Lotgering et al. (1984) explained that "when the stress of strenuous physical activity is superimposed upon that of pregnancy, the metabolic demands of the gravid uterus may come in conflict with those of the exercising muscles" (p. 560). Morton, Paul and Metcalfe (1985) added that "[c]ircumstantial evidence suggests that when maternal respiratory and hemodynamic [cardiovascular] adjustments to pregnancy are compromised, the health and development of the fetus suffers" (p. 97).

[165] Interactive effects on variables such as heart rate and ventilation are difficult to predict and in turn are dependent on a number of other factors such as stage of pregnancy and the type of conditioning programme (see McMurray et al., 1993, p. 1314).

Based on their understanding of the physiology of both pregnancy and exercise as well as their theories about the interaction between the two, researchers had several common concerns about prenatal exercise (see Artal & Wiswell, 1986; Lotgering et al., 1984; Morton et al., 1985; Shangold, 1980; Snyder & Carruth, 1984).[166] More specifically, it was postulated that maternal exercise would result in a re-distribution of blood flow to the woman's working muscles and away from the pregnant uterus. This would in turn force the fetus to compete with maternal skeletal muscles for: oxygenated blood (potentially leading to fetal hypoxia and distress)[167]; essential substrates such as glucose (possibly contributing to fetal growth restriction); and heat dissipation (potentially leading to fetal hyperthermia and potential teratogenic effects) (see Wolfe, Ohtake, Mottola & McGrath (1989b) for a summary of research in the mid-1980s). The possibility that maternal exercise – especially strenuous exercise such as long distance running – would negatively impact fetal outcomes by leading to premature labour and/or lower birth weights was another identified risk.[168] There was also, of course, the long-standing anxiety that the impact of stress forces created by certain physical activities (i.e., running, aerobics) on the large pregnant uterus might cause membrane rupture, placental separation, premature labor, direct fetal injury or umbilical cord entanglement (see Clapp, 1994, p. 445; Bagnall et al., 1983). There was also concern that the pregnant exerciser

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[166] In their clear and comprehensive review of existing research on aerobic exercise and pregnancy, Sady and Carpenter (1989) explain that there are two types of research, those examining the acute effects of exercise during pregnancy (often animal studies) and those examining chronic responses to exercise (i.e., exercise training during pregnancy). The latter consisted of three case studies, group studies (critiqued as limited and unreliable), and anecdotal /observation data on pregnant elite athletes.

[167] Fetal heart rate was a common measure of fetal well-being, although Lotgering et al. (1984) indicate that fetal distress could also be associated with changes in other fetal variables such as blood pressure, cardiac output and hematocrit levels. They further explain that previous examinations of fetal heart rate prior to and following mild to moderate exercise were inconclusive – although many reported no significant changes during short term or prolonged exercise. They also suggest that, based on animal studies, other fetal cardiovascular variables appear to be largely unaffected by maternal exercise.

[168] Shangold (1989, p. 1677) noted that pregnancy outcome was best assessed by reports of perinatal morbidity and morality, by birth weight and by neonatal growth and development.

was at increased risk of suffering from chronic fatigue and musculoskeletal injury (due to an increase in joint laxity caused by hormonal changes during pregnancy and/or changes in posture and centre of gravity).

Although the majority of research focused on the impact of exercise on the fetus, there was also interest in the possible benefits to the mother which included the prevention of maternal weight gain, the facilitation of labour and recovery (i.e., make them easier/faster), the promotion of good posture, the prevention of low back pain and improved feeling of maternal well-being (see Wallace & Engstrom, 1987 for a concise review of this research). There was also interest in the extent to which women (especially competitive athletes) could actually *increase* their physical fitness and elicit training effects while pregnant – or at the very least, avoid losing their pre-pregnancy fitness levels (see Dressendorfer, 1978; Sibley, Ruhling, Cameron-Foster, Christensen, & Bolen 1981 for more detail).

Reflecting back on the situation in the early 1980s, Canadian researchers Wolfe and Davies (who helped to create the 2003 Canadian guidelines on exercise during pregnancy) noted that "as a result of the conflict between the postulated benefits and risks, the idea that a dose-response relationship existed between the quantity and quality of exercise and maternal/fetal well-being quickly emerged" (2003, p. 488). In other words, researchers believed that there was an optimal zone for exercise prescription after which the risks of fetal growth retardation, altered fetal development, premature birth, as well as chronic fatigue and musculoskeletal injury (in the mother) increased (see also Wolfe, Brenner & Mottala 1994).

There was, however, uncertainty regarding exactly what constituted the 'optimal zone' for exercise during pregnancy, due in large part to the fact that findings from many of the studies were contradictory. Research on fetal heart rate (FHR), a commonly used measure of fetal well-being, is illustrative. Some investigators reported no changes in fetal heart rate following short bouts of moderate intensity exercise while others reported an accelerated FHR (tachycardia). Research on FHR *during* exercise was similarly inconsistent as some investigators observed a slowed fetal heart beat (fetal bradycardia) and others an accelerated rate (tachycardia)[169] (see Lotgering et al., 1984, p. 564; Wallace & Engstrom, 1987, p. 282). This is only one such example and there were also contradictory and inconclusive findings regarding the impact of exercise on birth weight, fetal adaptability to thermal stress, glucose uptake by the fetus during maternal exercise, maternal exercise and risk of early miscarriage, as well as the effects of exercise on length of gestation (i.e., premature labour). A common conclusion in review articles published in the 1980s was that more research was needed in order to come to definitive conclusions.

Methodological difficulties were identified as a central barrier to the study of exercise during pregnancy (see Artal & Wiswell, 1986; Lotgering et al., 1984; Wallace & Engstrom, 1987). Ethical considerations prevented pregnant women from being tested

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[169] There was evidence of debate about how to best assess fetal heart rate (Doppler ultrasound fetal monitors or M-mode echocardiographs). A series of "Letters to the Editor-in-Chief" appeared in *Medicine and Science in Sports and Exercise* following the publication of an article entitled "Fetal heart rate measurement during maternal exercise – avoidance of artifact" by Paolone, Shangold, Paul, Minnitti & Weiner (1987). Paolone et al. concluded that motion artifact resulted when fetal ultrasound monitors were used to assess FHR so that the fetal bradycardia reported by others (most notably a group led by Artal) did not actually occur (i.e., was motion artifact). They advocated the use of M-mode echocardiographs for artifact-free determinations of FHR. The Paolone et al. article was followed by letters to the Editor-in-Chief by Clapp (1988) and Artal (1988) which questioned the conclusions of Paolone et al. (1987), as well as responses by Paolone (1988) and Paolone & Shangold (1988) to the letters of Clapp (1988) and Artal (1988).

under strenuous circumstances (i.e,. exhaustive exercise near term), making it difficult or even impossible to determine the extent to which exercise responses differed as a result of pregnancy per se, and for a similar reason, there was no data regarding fetal outcomes under strenuous circumstances (Lotgering et al., 1984, p. 560; Lotgering, Gilbert, & Longo, 1986, p. 21). As a result, the most reliable physiologic data at the time were derived from animal studies - although even these studies were of questionable reliability. In their 1989 review of the state of knowledge on exercise during pregnancy, Wolfe et al. (1989a) noted that physical conditioning studies involving lab animals had resulted in conflicting observations, with some researchers citing negative findings with respect to reduced maternal weight gain, reduced fetal weight, and increased fetal mortality and reduced litter size while other investigators reported no significant ill effects of chronic exercise on pregnancy outcome (p. 278). The varying experimental results, they noted, "may be related to differences in the species being studied, the modality, intensity and duration of exercise employed, presence or absence of familiarization of animals to exercise before pregnancy and methods and timing of fetal outcome assessment" (ibid.). It was also acknowledged that animal studies were (and are) of limited applicability to humans due to physiological differences – quadrupeds are less subject to venous pooling, they eliminate heat by a different mechanism and cannot necessarily be motivated to perform exhaustive exercise in the absence of other stress (Lotgering et al., 1984).

Researchers agreed that more studies needed to be conducted on humans, but such studies had to be large scale and well-controlled in order to avoid intervention of confounding variables. "The effect on fetal outcome of a single factor such as exercise," explained Lotgering et al. (1984):

> is easily obscured by the wide normal variation in outcome caused by a multitude of variables, including genetic and socioeconomic factors, nutrition, environmental factors, 'stress', and so forth. Thus, the question of whether physical activity affects fetal outcome can be answered only by *large, well-controlled prospective epidemiological studies. We know of no such study in pregnant women.* (p. 565, emphasis added)

According to researchers, many of the exercise studies lacked suitable control groups. As Wallace and Engstrom (1987) explained, "randomization of subjects into treatment groups is nearly impossible since exercising people are rarely willing to stop exercising for significant periods of time" (p. 277). Thus, researchers were unable to randomly assign participants into experimental groups and control groups – a methodology which provides maximum validity within the positivist paradigm. Studies of pregnancy outcomes of women who engaged in *vigorous* exercise were perceived as even more methodologically unsound as they were based on a few case studies and anecdotal evidence (from elite and/or Olympic athletes who had continued to compete). In addition to the small sample sizes and lack of control groups, review articles noted that there was also little consistency in exercise protocols used between the studies which made it difficult to compare data across different studies and likely contributed to the inconsistent results across the various studies (See Clapp, 1991; Wallace, Wiswell & Artal, 1986, p. 134).

Early anecdotal evidence and case studies that had spurred some physicians to alter their exercise advice and encourage pregnant women to engage in physical activity were thus being called into question when assessed by what was largely becoming accepted as more rigorous research standards. Under these new standards, randomized control trials (RCT) were privileged as the most reliable form of knowledge and other knowledges (those not quantitative or RCT-based) were viewed as less 'true' or

dismissed altogether. The privileging of RCT's is reflective of the move towards a system known as 'evidence based medicine' (EBM) which "ranks 'evidence' according to the reliability and verifiability of the epidemiological research design used, from randomized controlled trials at the top to physicians' anecdotal reports and case studies at the bottom" (Lambert, Gordon & Bogdan-Lovis, 2006). Interestingly, EBM originated in the context of pregnancy and childbirth in the late 1980s as three obstetricians published a text call *Effective Care in Pregnancy and Childbirth* (Enkin, Keirse & Chalmers, 1989) that was "a landmark in the development of an authoritative knowledge of birthing practice" (Johnson, 1997, p. 351). The EBM movement grew in subsequent years and numerous fields of medicine currently receive systematic scientific evaluation of existing research.[170] With this shift, what had previously counted as knowledge in the eyes of some was being critiqued as inconclusive and uncertain. We see how the 'rules of formation' guiding the scientific community (i.e., a positivist paradigm) shaped what could be counted as definitive knowledge or 'truth.' In recent years, social scientists have critiqued this 'way of knowing' whereby certain types of knowledge are celebrated for their purported 'objectivity' or freedom from bias, while ignoring the social, historical and political contexts that "lend them their currency and power" (Murray, Holmes, Perron & Rail, 2007, p. 515; see also Holmes, Murray, Perron & Rail, 2006; Lambert et al., 2006). "[T]he problem with EBM," argue Murray et al. (2007), is that "at best, it downplays, and at worst, it utterly disavows the subjective elements operating at the heart of its own system" (p. 514).

[170] In 1993, Iain Chambers (who was a driving force behind the original effective care collaboration) spearheaded the formation of the Cochrane Collaboration, a group of over 15,000 volunteers in more than 90 countries who apply a rigorous, systematic process to review the effects of health care interventions tested in biomedical randomized control trials (Johnson, 1997).

Significantly, the perception of inconclusive evidence and lack of definitive 'truth claims' created uncertainty with respect to just how much was safe, leading to disagreements within the scientific community regarding appropriate activity for pregnant women. Experts who viewed the pregnant body as inherently 'at risk' and prenatal exercise as a danger to the fetus advocated caution in the face of uncertainty, while those who perceived the pregnant body as less risky took a more flexible approach. Within the academic and trade journals, there was notable variation with respect to the types of activities deemed to be appropriate, at what stage of her pregnancy a women should begin to exercise (and if at all if she was previously sedentary), as well as the optimal target range with respect to duration, frequency and intensity (see Diddle, 1984; Morton, Paul & Metcalfe, 1985; Shangold, 1980; Sibley et al., 1981; Snyder & Carruth, 1984).

The exercise prescriptions provided by Snyder and Carruth (1984) represented the more conservative end of the spectrum. According to them, walking was an excellent activity for pregnant women but:

> jogging should be discouraged, at least in the later stages of pregnancy, due to the progressive lordosis characteristic of the last trimester. Jogging could present a problem with balance and place a strain on the pelvic ligaments, which are softening due to the hormone changes of advancing pregnancy. (p. 36)

They went on to explain that "maternal heart rate should not exceed 140-150 bpm (depending on fitness level) for approximately 15 minutes, 3-5 times a week"[171] and concluded that "because of the paucity of information about exercise during pregnancy and the stress it may create for the fetal heart rate and breathing movements, a conservative approach seems justified due to our limited knowledge" (ibid).

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[171] Similar to Morton et al. (1985), the rationale for this intensity, duration and frequency was that it would elicit an aerobic training effect in most women of childbearing age thereby allowing for maintenance of fitness level in most women, while producing minimal fetal response (p. 36).

Others, however, provided advice that was less prescriptive and restrictive. In their book, *The Complete Sports Medicine Book For Women* (intended for the layperson), Shangold and Mirkin (1985) stated that in the absence of obstetrical problems or complications a woman could probably continue exercising at "the same perceived level of exertion" right up until delivery (p. 128) (i.e., no heart rate limits were provided). They also explained that "despite some old wives' tales to the contrary, exercising does not increase a woman's chances of having a miscarriage or stillbirth" (p. 128) and provided a long list of sports recommended throughout pregnancy, including jogging, softball, basketball, roller skating, waterskiing, downhill skiing and aerobics (p. 130).[172] Judy Lutter (1985), President of the Melpomene Institute (a grassroots feminist health centre in the US), also refrained from providing specific guidelines concerning intensity, duration, and frequency of exercise. Women wishing to run throughout pregnancy were advised to continue but to be aware that they may need to decrease exercise speed, intensity and frequency, should avoid exercising to exhaustion (and overheating/dehydration) and should resist making preset (and unrealistic) goals regarding their running (i.e., be willing to switch to other lighter impact sports if need be). They were also encouraged to seek

[172] They did, however, caution that: endurance sports may decrease the supply of oxygen available to the fetus or increase fetal temperature especially if the session was over thirty minutes in length; that women not used to these activities should not begin during pregnancy; and that women should avoid activities with risk of abdominal trauma. Significantly, the advice of Shangold was often cited in popular magazines such as *Parents* (Cole & Laibson, Feb 1983, p. 39), *Glamour* (Gordon, May 1982, p. 114), *Ms.* (Bonavoglia May, 1983, p. 69) and *Women's Sports and Fitness* (Mantell, June 1984, p. 62). While many of the articles in popular women's magazines encouraged aerobic exercise during pregnancy and were quite liberal with respect to what women could and could not do, some focused more attention on the uncertainty regarding the effects of aerobic exercise during pregnancy, taking on a tone of caution (see Hillard (1985) in *Parents*; Kaplan (1984) in *Vogue*; Keerdoja (1984) in *Newsweek*).

moral support for their decision to continue to exercise – in order to counteract unfounded concerns, rumors and heckling (p. 682).[173]

Lutter (who was neither a physician nor an exercise scientist) based many of her recommendations on a survey conducted by the Melpomene Institute in which women were asked about their pregnancy and exercise experiences. The Melpomene Institute research thus privileged women's voices as opposed to laboratory studies measuring heart rate, cardiac output and other physiological variables. The data produced using this women-centered approach received a poor rating according to the rules of evidence based medicine, but was deemed by Lutter and her organization to provide a valid basis for shaping exercise recommendations. The pregnancy and exercise research conducted by the Melpomene Institute was part of the larger mandate of the women-centered research center (created in 1982 and of which Lutter was the founder and president) that worked to dispel exercise myths that deterred women from many activities and sports (Weider & Weider, 1994).

That a women's health organization weighed in on the debate regarding 'how much' – and that the key piece of advice provided was to 'listen to your body' - illustrates how, in the early to mid-1980s, the issue of exercise during pregnancy was about more than 'what is safe.' The methodological limitations of the research and conflicting data that resulted meant that the existing investigations were open to a wide range of interpretations, allowing the ideological, political and professional commitments of the experts to emerge. Disagreement over acceptable guidelines thus reflected wider societal debates over control of the female body, as well as whose knowledges (guidelines) would

[173] Part of the research focused on the experiences of pregnant women who ran throughout pregnancy, listing the problems encountered along with recommendations for how to overcome certain obstacles (see p. 681).

be accepted as the dominant discourse in the growing field of prenatal exercise research.[174] The debates within the medical community regarding how much and how far are particularly interesting because they shed light on the contingent nature of knowledge – something that it usually hidden under the aura of scientific objectivity.

Professional Power Struggles and Epistemological Debates: Controversy over the Creation of a 'Gold Standard'

In May 1985, the American College of Obstetricians and Gynecologists published a set of guidelines concerning exercise and pregnancy entitled "Exercise During Pregnancy and the Postnatal Period" (ACOG, 1985).[175] According to the introduction of the document, it was necessary to create exercise guidelines for pregnant women because although regular exercise might appear beneficial during this time, "the unique physical and physiological conditions that exist during pregnancy and the postpartum period create special risks that do not affect nonpregnant women" (p. 313). It was further explained that "exercise standards for pregnant women, one of the major subgroups in the general population, have not been set" (p. 314) and as a result current advice was commonly based on intuition and common sense. This was perceived to be a problem because "[t]he societal pressures to exercise today and the competitive spirit that challenges some women to place performance goals above safety indicate the need for a scientific

[174] Although there was disagreement around several issues (the advisability of jerky/bouncy movements; safety of weight training; optimal target range with respect to intensity, duration and frequency; and when to initiate a new exercise program in pregnancy) there was also general agreement that women should avoid exercising in hyperthermic environments, activities with risk of traumatic injury and that exercise prescriptions should be individualized.

[175] The ACOG, established in 1951, is the national society that represents practicing obstetricians and gynecologists in North America. One of the mandates of the society is the continuing education of its members in the United States and Canada. Hence, it frequently publishes educational bulletins regarding current knowledge and technology (Visscher, 1991, p. 313 in Artal Mittelmark, Wiswell & Drinkwater, 1991). The College does not conduct the original medical research but "develops consensus documents through the work of committees and task forces composed of its members who have both special expertise and practical experience" (p. 313).

approach to recommendations for exercise" (p. 314). A central motive behind the creation of the guidelines, then, was to compile expert knowledge that physicians could pass onto pregnant women to use to monitor and regulate their exercise practices and reign in their 'competitive behaviour.' Scientific knowledge was thus privileged over women's own knowledge of her body, the suggestion being that women could not be trusted to know and/or acknowledge their bodily limitations. In Foucauldian terms, the guidelines were part of the apparatus in the growing institution of exercise and pregnancy science, creating norms to which the women were expected to internalize and adhere to, ensuring that they did not harm the growing fetus or themselves – albeit with a focus on the former.

Professional power also appears to have been a motive in the creation of the guidelines as they were positioned as a panacea to the unscientific (and therefore dangerous) advice provided by 'nonprofessionals' who were marketing programmes to pregnant women which contained medical content that was "often inappropriate, inaccurate, or incomplete" (p. 313). Although not stated as explicitly, the guidelines were also likely intended to counter the less restrictive advice being put forth by other professionals within the research and medical community. Establishing the guidelines thus allowed the creators to increase their authority in the emerging field of exercise and pregnancy – as well as weigh in on social issues of the time (i.e., the boundaries of appropriate behaviour for pregnant women).

Following a brief outline of the pregnancy-related changes that impact a woman's ability to exercise (i.e., changes to the connective tissue, cardiovascular and respiratory system, as well as metabolic and fetal response to exercise) and how exercise during

pregnancy might impact the fetus, advice for 'developing an exercise prescription' was provided.[176] It was explained that:

> the potential for maternal and fetal injury is significant because of the musculoskeletal and cardiovascular changes at this time. Although the risk of fetal injury is probably small, there are insufficient scientific data to support this belief. Therefore, exercise recommendations must err on the conservative side. (p. 316)

According to the guidelines, the goal of exercise during pregnancy was to maintain the highest level of fitness possible while maintaining a maximum level of safety. Given the privileging of fetus over mother, it was acknowledged that "it is not possible to maintain cardiovascular fitness at optimum levels, nor to achieve the level of strength-training that would be reasonable in the nonpregnant state, at least as far as our knowledge at present is concerned" (p. 316). A detailed list of specific exercise guidelines were provided (for both the pregnant and postpartum woman), including several activities to avoid: vigorous exercise in hot, humid weather; ballistic movements (jerky, bouncy motions); deep flexion or extension of joints (i.e., stretching) due to connective tissue laxity; activities requiring jumping, jarring motions or rapid changes in direction (because of joint instability). It was also advised that regular exercise (at least 3 times per week) is preferable to intermittent exercise, that women should ensure they undertake a proper warm-up and cool-down and are properly hydrated. Guidelines specific to pregnant women were also listed – and were largely a series of prohibitions: maternal heart rate was not to exceed 140 beats per minute; strenuous activities were not to exceed 15 minutes in duration; maternal core temperature was not to exceed 38 degrees Celsius; and

[176] The discussion of changes to the pregnant body and the possible impact of exercise provided little nuance. Animal studies suggesting that the fetus was not negatively impacted by maternal exercise were dismissed and in light of the paucity of human studies to corroborate such findings, a cautionary tone was taken – which carried into the actual guidelines.

women were to avoid exercises that employed the Valsalva maneouver[177] as well as exercises in the supine position after the fourth month of gestation. Sedentary women were advised to begin with physical activity of very low intensity and to advance activity levels very gradually.

The response to the guidelines was not overly positive from some individuals within the scientific and medical community. In an article featured in *The Physician and Sportsmedicine* almost a year following the release of the ACOG guidelines, assistant editor Michele Gauthier wrote:

> since the ACOG guidelines for exercise and pregnancy were released almost one year ago, they have been the subject of some controversy. Some critics contend that the guidelines are too general, others think they're too specific. ACOG stands behind the guidelines. (April 1986, p. 162)

According to Artal (who was central in the creation of the guidelines and was interviewed for Gauthier's article), the guidelines were well-received by the media and public, with an "overwhelming demand" for the videotape that was created in conjunction with the guidelines. He further contended that "of all the highly specific programmes available today, none of the programmes except ACOG's were based on research or tested in the laboratory" (Gauthier, 1986, p. 164).[178] However, noted Gauthier, "some exercise researchers, athletes, and physicians, including one of the original members of the planning committee, disagree with the guidelines" (p. 162). A central problem of the

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[177] This occurs in activities such as weight lifting where the lifter temporarily holds her breath while pushing a weight, increasing blood pressure.

[178] The guidelines were created following deliberations by an educational task force of eight content experts (p. 313). The planning committee created an exercise programme which was field-tested on 10 pregnant women and modified based on their feedback (see Gauthier, 1986). Once the programme reached a stage where the women were comfortable performing the exercises, Artal (along with two exercise physiologists, a bio-chemist and a nurse) examined the cardiovascular, respiratory and hormonal responses of the 10 pregnant women in his laboratory. Artal also played a central role in the actual writing of the guidelines. At the time, he was an Associate Professor of Obstetrics and Gynecology and of Physical Education and Exercise Sciences at the University of Southern California. He was also co-author of the book *Exercise in Pregnancy* (1986).

guidelines, she explained, was the lack of input from other professionals beyond the 8-member ACOG committee. Since the guidelines were presented to ACOG members in a completed form, any discussion or debate within members of this organization or the ACSM was precluded.

Another concern lay with the lack of data supporting the guidelines. Dr. Mona Shangold, a prominent figure in the women and sports medicine community, lamented that the guidelines "are rather sweeping conclusions that are not based on his or any other data. [Artal] recommends do this and this, but his advice doesn't reflect the data he presented in his book" (cited in Gauthier, 1986, p. 165).[179] Shangold's critiques are thus focused directly at Artal, illustrating how the debates took on a personal tone that was evident in several of the exchanges published in the medical journals. The instructions to avoid bouncy movements and to keep heart rate below 140 beats per minute also came under fire for being arbitrary with no evidence to back up these restrictions. Another point of contention was the caution that the pregnant woman should not perform exercises while lying on her back.[180] According to several health care professionals cited in Gauthier's article, very few women actually suffer from low blood pressure while lying in the supine position and because the first symptom is dizziness, it is easy to identify the issue and have the woman flip over onto her side. It was also suggested that in trying to design a programme that would be safe for 99.9% of women, the guidelines did not recognize the different fitness levels and backgrounds of pregnant women – and were therefore too conservative. While Artal acknowledged that exceptional athletes

[179] Shangold was at that time, an Assistant Professor of Obstetrics and Gynecology, Director of the Sports Gynecology Center at Georgetown University, and chair of Sports Gynecology Society of ACOG.
[180] The rationale for this caution was that in early pregnancy, significant changes in cardiac output and blood pressure can result in orthostatic hypertension while later in pregnancy, lying on the back can cause the uterus to impinge on the aorta and cause a reduction of blood supply to the uterus.

could likely go above and beyond the guidelines, he explained that these individuals are unique and:

> when you look at the general population and have the safety of both mother and fetus in mind, then you err on the safe side rather than the unsafe side. Most of these women are going to exercise under unsupervised conditions. (cited in Gauthier, 1986, p. 167)

According to Gauthier, one of the biggest problems with the guidelines was that the ACOG may have unwittingly set a legal standard. She explained that while proponents of the guidelines argued that they had provided an established standard for physicians who may not have known what advice to give a patient, "opponents [of the guidelines] also see this potential but read it as a method of arming lawyers, who can use the guidelines against those who may advise a patient to do more" (1986, p. 168). For the physician concerned about a potential lawsuit, prenatal exercise advice now entailed calculating the possible risk to mother and fetus, as well as litigation risk. Even if a care provider did not think exercise would harm the mother or fetus, he or she might 'err on the side of caution' (and follow the sanctioned ACOG guidelines) out of fear of a lawsuit if a problem with mother or fetus developed (regardless to whether it was related to maternal exercise or not). This situation illustrates the overlap between the legal and medical complexes in contemporary Western society and, more specifically, the way that medical knowledge (the guidelines) can come to take on the status of juridical 'rules' with the potential to be used to mitigate damage to the mother or fetus (see Rose & Valverde, 1998).

And there is evidence to suggest that some trainers running prenatal exercise programmes followed the guidelines closely. In an interview featured in December 11 1989 edition of *Newsweek*, the director of Mothers in Motion (a prenatal exercise

programme in Boston) confirmed that she followed the ACOG guidelines "to the letter" explaining that "[p]eople say, I'm only pregnant...but many things can go wrong, and you can't tell who it will happen to" (p. 79). Adherence to the guidelines was even used as a marketing strategy - on the cover of the popular "Denise Austin's Pregnancy Plus Workout video (1990) it was proclaimed that the tape "conforms with the guidelines of the American College of Obstetricians and Gynecologists" and this selling point was repeated in a October 1993 summary of the video featured in *Total Health* magazine. Of course, it is difficult to tell the extent to which health care professionals followed the guidelines (especially those in Canada where legal pressures may not been as significant), but according to one researcher reflecting on the situation "what the obstetrician usually recommends is what the ACOG guidelines say – and they're extremely conservative. They restrict duration and intensity of exercise quite stringently" (Clapp cited in White, 1992, p. 181). Dr. Patty Kulpa also noted that "obstetricians who do not know much about exercise during pregnancy are likely to adhere closely to the guidelines because of possible legal complications" and she added that "there is a perception that the ACOG guidelines represent the standard of care" (Kulpa cited in White, 1992, p. 181).

Debates about the safety of prenatal exercise and the appropriate limits for pregnant exercisers continued (and even grew) into the late 1980s and early 1990s. Numerous articles were published in family practice journals (by physicians, nurses and midwives) weighing the relative risks and benefits of exercise during pregnancy, with some recommending the ACOG guidelines and others providing alternative suggestions (see Fishbein & Phillips, 1990; Huch & Erkkola, 1990; Jarski & Trippett, 1990; Leaf, 1989; Sady & Carpenter, 1989; Snyder, 1990; Shangold, 1989; Wallace & Engstrom,

1987). After an initial period in which the ACOG guidelines were simply outlined in popular magazines such as *Glamour* (MacCallum, August 1985), *Chatelaine* ("Exercise During Pregnancy," April 1986), *McCall's* ("Pregnancy Workout," September 1985), *Harper's Bazaar* (Platt, October 1985) and *Runner's World* (Heinonen, September 1985), the debates and uncertainties circulating within the medical community emerged in the popular press. For instance, after publishing an article in November 1985 which cited the ACOG guidelines and presented aerobic activity during pregnancy as a "potentially risky activity," *Women's Sports and Fitness* published an article in May 1986 in which author Michele Kort noted that the ACOG guidelines are "helpful but quite conservative (they recommend against weightlifting and jogging and suggest exercising for only 15 minutes and keeping your heart rate below 140)" (Kort, 1986, p. 58). In a text box entitled: "Playing it Safe: Guidelines for Exercise during Pregnancy" women were advised to follow the advice of their doctor, to be prepared to lower their expectations[181] and to be sure to stay cool and comfortable. Finally, citing the work from the Melpomeme Institute, the reader was told to "listen to your body - if it doesn't feel good slow down", but on the other hand, "if you feel great and can run miles when you're six months pregnant, go for it. Don't listen to those who would hold you back because of irrational fears" (p. 40). This was followed by additional articles in December 1988 (Anderson, 1988) and June 1989 (Davis, 1989) in which the ACOG guidelines were again questioned and alternative (more liberal) advice suggested.[182]

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[181] The reader was thus encouraged to recognize that she would likely be moving more slowly and working harder while exercising during pregnancy, such that she should work at a level that seemed like her pre-pregnancy level based on breathing and overall effort.

[182] The December 1988 article (Anderson, 1988) cited Shangold who questioned the notion that the bouncing movement of running would damage the fetus or increase injury to women (due to joint laxity). Shangold further explained that a moderate 30 minute work-out using perceived exertion to judge intensity was safe. That said, the advice of Shangold that was cited in the column had a more cautionary tone (with

Although the controversy was more pronounced in women's magazines that focused on health and physical fitness such as *Runner's World, Women's Sport and Fitness* and *Health*, by the early 1990s magazines such as *Parents* (Cherry, 1991) and *Better Homes and Gardens* (Atkins Hessekiel, June 1991) also began to question the guidelines (albeit to a lesser degree). Several of the articles (see Cummings, January 1986; Davis, June 1989; Kaufmann, Dec. 1988; September 1992; Morgan, November 1988) provided a detailed discussion of the physiology of pregnancy, the points of debate or disagreement among the physicians and exercise scientists, and also explained the methodological shortcomings of many of the existing studies which resulted in the uncertainty regarding what and how much is safe. Readers were therefore provided with a nuanced discussion of the research results and key issues/controversies, allowing them the opportunity to assess the situation for themselves - something which, as I explain in the following chapter, is largely absent in the popular literature published in the last several years.

Writing in the May 1992 edition of *The Physician and Sportsmedicine*, Dr. Jacqueline White observed that at the heart of the debate surrounding the ACOG guidelines was "the degree of trust that physicians can place in the pregnant woman's ability to monitor her body's response to exercise" (1992, p. 186). On the one hand were those with reservations about encouraging women to listen to their bodies and this group preferred to set safe parameters. She held up Artal as such an individual, citing his observation that "it's better to be judicious and prevent injuries than to respond to

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an emphasis on the danger of overheating) that was absent from the advice she provided in her 1980 book chapter (Shangold, 1980). It may be that she changed her view on some issues according to the research that was being conducted – or that the issue of legal liability urged her to issue slightly more conservative (prescriptive) advice.

symptoms once they occur" (Artal cited in White, p. 186). On the other hand, White suggested, was a growing number of experts (in both the United States and Canada) who were suggesting that pregnant women could follow their common sense and safely listen to their bodies. She cited Larry Wolfe, associate professor in the School of Physical and Health Education at Queen's University, who explained: "healthy pregnant women with normal pregnancies can exercise as long as they stay within an envelope of comfort and don't get overtired or overheated" (p. 182).[183] In short, the discursive rules that defined what can be said and what is counted as worth knowing (with respect to the pregnant body) were under debate. While it appears there was a common belief that methodologically rigorous research was better, some health care experts felt that in the absence of such knowledge, women could be trusted to monitor their own bodies while others rejected this assertion. While the debate was in large part an epistemological one as it concerned the discursive rules of formation or 'what counts as knowledge,' it was the object of the knowledge under debate - the reproductive body – which fueled the controversy. Indeed, it is questionable whether or not such debates would be waged over whether the male could be trusted to listen to his body when engaging in physical activity.

It is easy to get caught up in the controversy around appropriate exercise prescriptions (i.e., who is right and who is wrong) and in doing so lose sight of the fact that both subscribed to the idea - to a certain extent – that the pregnant woman needs to

[183] White wrote that "by carefully assessing a patient's exercise history and teaching self-monitoring techniques, the physician can work with an active woman to create a safe exercise program during her pregnancy" (p. 179). Interestingly, White also observed thatconcerns about the conservative nature of the 1985 ACOG guidelines did not arise out of the belief that women did not need guidelines. Rather, the concern was that more active women would become frustrated with the overly-restrictive guidelines, ignore them, and then do whatever they wanted.

be hyper-aware of her body, monitoring its response and engaging in self-surveillance. The vociferous debates concerning 'what counts as knowledge' and 'how much is safe' constituted the pregnant body as the object of scientific enquiry, in need of surveillance - whether by the direct gaze of a health professional or the women herself. This likely shaped some women's subjective experience of pregnancy and exercise, robbing it of enjoyment and turning it into a guilt and anxiety-ridden excursion. Indeed, I came across several articles in popular magazines in which the writers lamented that they were confused, upset and frustrated by the lack of conclusive exercise guidelines for them to follow (see Davis, 1989; Morgan, 1988).

Creating 'Better' Knowledge through 'Better' Research

While body experts may have debated the extent to which women could be trusted to listen to their bodies, it appears that there was consensus on one thing: more research – research that followed more rigorous standards – was needed in order to create 'better' knowledge and in turn better guidelines. Indeed, this was a common refrain in the 'future directions' section of research articles. The exercise and pregnancy research field continued to grow throughout the 1990s as efforts were made to answer this call. Clapp (1991), for instance, conducted a review of clinical studies examining the impact of maternal exercise (in humans) on the well-being of the fetus. The review included his own ongoing prospective study which, he claimed, avoided many methodological problems because of its large sample size, clear definition of exercise variables and assessment of labour outcomes (see Clapp, 1991, p. 10; 1994, p. 448). From his review, Clapp concluded that theoretical concerns about the possible negative impact of exercise

on fetal health (and findings from animal studies) were not supported.[184] There were no definitive answers as to why theoretical concerns did not seem to come to fruition, Clapp explained, but

> several physiological similarities between the physiological adaptations to pregnancy and to exercise suggests that they may actually *complement* one another. In turn, that modifies the thermal, hemodynamic and metabolic alterations induced by the exercise which ultimately is *protective* for the conceptus. (p. 13, emphasis added)

In short, Clapp suggested that three major feto-protective adaptations appeared to occur when regular exercise was continued during pregnancy: an improved capacity for heat storage and dissipation (which diminishes the heat stress of exercise); an increase in blood volume expansion (which should decrease the blood flow distribution away from the fetus and placenta); and improved placental growth and functional capacity (which maintains fetal delivery of oxygen and substrate during exercise and should provide the fetus with an extra margin of safety when unexpected stresses occurs) (1996, p. S 28-9).

Clapp's assertion that pregnancy and exercise are actually additive and feto-protective stood in stark contrast to earlier theories about the additive effects of exercise and pregnancy, that is, the assumption that the stresses of pregnancy and exercise would result in "a doubled physiologic impact" – with the fetus possibly suffering the consequences (see Mullinax & Dale, 1986, p. 563). Citing the guidelines of the ACSM (1986), the ACOG (1985) and the work of Sady and Carpenter (1989), Clapp argued that:

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[184] The sample of his study consisted of 158 well-conditioned athletes who ran, performed aerobics, cross country skied and/or cycled and 83 matched controls (Clapp, 1991, p. 10). In his review, Clapp (1991) focused on five areas of fetal health, namely embryonic development (i.e., does exercise result in infertility, abortion, congenital abnormalities?), fetoplacental growth (does exercise lead to smaller babies?), gestational lengths, fetal stress/distress and effects of exercise on the condition of the fetus during labour and birth. He did not report any negative outcomes (despite the fact that many of the exercise regimens performed by the study participants were at levels above the 1985 ACOG guidelines) and in the case of the latter category, concluded that "the fetus and newborn exposed to maternal exercise in late pregnancy demonstrates less not more evidence of potential compromise" (p. 13).

> several sets of sanctioned guidelines are available from individuals who believe that defined restrictions are an essential part of an exercise regimen in pregnancy. The factual data, however, clearly support the development of a flexible approach to exercise during pregnancy. (Clapp, 1994, p. 453)

Additional reviews added weight to the pressure for a more flexible approach to exercise during pregnancy. Lokey, Vu Tran, Wells, Myers and Tran (1991) conducted a meta-analysis of 18 studies that measured pregnancy outcomes of exercising women (this was the first such study on prenatal exercise, as others were narrative reviews) and reported that none of the outcome variables differed significantly between the exercising and control women (i.e., maternal weight gain, gestational length, length of labour, infant birth weight and APGAR scores were similar). While acknowledging that more research was needed before firm guidelines regarding safe limits to exercise could be made, Lokey et al. noted that many of the exercise programmes in the studies included in their meta-analysis exceeded the recommended ACOG guidelines (especially with respect to the 140 bpm limit, bouncy movements and duration of exercise) (p. 1238).[185] Similarly, in the introduction of a 1993 article published in *Medicine and Science in Sports and Exercise* (the official journal of the ACSM), McMurray et al. stated that "[o]ur understanding of maternal physiological responses to exercise has dramatically expanded in the past 5 years...Increased knowledge has resulted in some researchers and practitioners suggesting that the ACOG Guidelines may be too conservative and in need of revision" (p. 1305). Following their review of the literature, they came to a similar conclusion as Clapp (1991):

> [A]lthough animal research suggests maternal exercise can have teratogenic effects on the fetus, cause fetal hypoxia, and malnutrition, studies performed on humans do

[185] Lokey et al. (1991) suggested that more research was needed due to the limited number of studies measuring the effect of exercise on pregnancy outcomes in humans, the limited number of subjects in many of these studies, and the lack of control subjects (p. 1238).

not support these findings. Further, human data indicate a pregnant woman can exercise safely with minimal risk to herself and her fetus. (p. 1318)

In February 1994, the ACOG released a new set of guidelines for exercise during pregnancy (ACOG Technical Bulletin 189) in order to reflect emerging developments within the pregnancy and exercise research community. The 1994 guidelines began with a more positive tone than the ones issued almost a decade previously, observing that physical fitness and active recreation are integral elements in the lives of many women and that "in the absence of obstetric or medical complications, pregnant women who engage in a moderate level of physical activity can maintain cardiorespiratory and muscular fitness throughout pregnancy and the postpartum period" (p. 65). It was noted that most of the guidelines for designing a general fitness programme in women outlined in the 1992 ACOG bulletin could be applied to pregnant women - although obstetricians and pregnant women were encouraged to consider several modifications to the general guidelines based on the physiologic changes occurring during pregnancy (described in the first portion of the bulletin).[186]

The section "Recommendations for Exercise in Pregnancy and Postpartum" began with the statement that "[t]here are no data in humans to suggest that pregnant women

[186] The discussion of the physiological impact of exercise on the pregnant body was more nuanced in the 1994 guidelines than in the earlier 1985 document. Theoretical concerns were expressed, but it was also acknowledged that there was a lack of evidence to back up these concerns. For example, it was noted that in theory, hormonal changes may result in generalized increases in joint laxity, making the pregnant woman more susceptible to injury but that "this hypothesis has been substantiated by objective data only with regard to the metacarpophalangeal joints" (p. 66). Similarly, concerns around overheating were outlined. It was acknowledged that data regarding the effects of exercise on core temperature during pregnancy were limited, but it was also suggested that maternal physiologic adaptations to pregnancy may decrease the thermal stress and that "there has been no demonstrated increase in neural tube or other birth defects among pregnancies of women who continue to perform even vigorous exercise during early pregnancy" (p. 66). Differences between 'average' and 'fit' women were also acknowledged, as it was noted that while subjective workload and maximal exercise performance decrease in many women (due to the increased oxygen requirements of pregnancy and the increased work of breathing as the uterus pushes on the diaphragm), in some fit women "there do not appear to be associated changes in maximum aerobic power or acid-base balance during exercise in pregnancy" (p. 65-6).

should limit exercise intensity and lower target heart rates because of potential adverse effects" (p. 68) and was followed by a series of recommendations for women that did not have any additional risk factors for adverse maternal or perinatal outcome. Unlike the previous guidelines, limits around duration and intensity were not prescribed. Instead it was noted that:

> women should be aware of the decreased oxygen available for aerobic exercise during pregnancy. They should be encouraged to modify the intensity of their exercise according to maternal symptoms. In regards to duration, it is suggested that pregnant women should stop exercising when fatigued and not exercise to exhaustion. (p. 68)

In other words, women were encouraged to listen to their bodies. However, limits to exercise duration and intensity were provided in a more subtle manner, as it was suggested that pregnant women could follow the same guidelines for exercise as non-pregnant women which were outlined in "Women and Exercise" (ACOG, Technical Bulletin Number 173, October 1992). These guidelines were not actually provided, but according to the cited "Women and Exercise" document (ACOG, 1992), fitness benefits could be attained by working out at 60-80% of one's maximum heart rate for 20-30 minutes at least 3 times per week (p. 179-80).

Cautions to avoid ballistic movements and deep flexion/extension of the joints were also removed although it was acknowledged that non-weight bearing exercises (cycling, swimming) would minimize the risk of injury – a subtle suggestion that the latter exercises were preferable. Several cautions from the 1985 guidelines did remain, however, as pregnant women were advised to: avoid exercise in the supine position after

the first trimester (which is associated with decreased cardiac output)[187]; avoid prolonged periods of motionless standing (venous pooling will decrease cardiac output); activities in which loss of balance could be detrimental to mother or fetus; any exercise with potential for "even mild abdominal trauma" (p. 68). Finally, it was recommended that women who exercise during pregnancy ensure they received an adequate diet (especially important due to the increased metabolic demands of pregnancy) and that "pregnant women who exercise in the first trimester should augment heat dissipation by ensuring adequate hydration, appropriate clothing and optimal environmental surroundings during exercise" (p. 68). No specific temperature limit was provided, however (unlike the previous 38 degrees Celsius limit).[188]

Although more research had been conducted in the years separating the release of the first and second set of ACOG guidelines relating to exercise during pregnancy, according to the rules of EBM, knowledge concerning exercise during pregnancy remained limited and a clear definition of safe limits remained elusive (a point made in many of the research articles published during these years as I further discuss below). However, instead of providing detailed prescriptions and limitations when faced with this uncertainty, the 1994 guidelines were much more general (and less restrictive) than those issued previously, with the overall message being that moderate exercise during pregnancy was safe and that women should listen to their bodies – albeit with stronger

[187] It was noted that vigorous exercise in the supine position should especially be avoided as remaining cardiac output will be preferentially distributed away from the visceral organs – including the uterus (p. 68).

[188] This advice was provided despite the fact that in the section on 'thermoregulatory changes' it is stated that "[t]here has been no demonstrated increase in neural tube or other birth defects among pregnancies of women who continue to perform even vigorous exercise during early pregnancy" (p. 66). Thus, certain outcomes that were deemed to be particularly dangerous or negative (i.e., birth defects) evoked calls of caution in the face of uncertainty.

cautions remaining around temperature increases and the activities with a high risk of trauma.

The new, more flexible guidelines appear to have been met with considerably less debate and were used as a reference in several review articles on exercise during pregnancy in medical journals (Heffernan, 2000; Khanna, 1998; Pivarnik, 1994; Sternfeld, 1997), trade journals (Wang & Apgar, 1998; Carlson & Parrish, 1998) and in lay literature such as *Glamour* (Cadoff, June 1994), *Parents* (Gerszberg, May 1997) and *Women's Sports and Fitness* (Densmore, April 1997) (see also Williams, 1999). The article in *Women's Sport and Fitness* magazine (Densmore, April 1997) did question the 30 minute duration (and looked to the Melpomene Institute for alternative advice) but endorsed the remaining cautions.

There also was consensus between professional organizations in the United States. In the 1995 version (fifth edition) of the *ACSM's Guidelines for Exercise Testing and Prescription*, the ACOG recommendations for exercise in pregnancy were outlined and endorsed. It was noted that although exercise may not be appropriate for every pregnant woman (and the ACOG contraindications to exercise are presented to help define such women) "for most pregnant women, exercise – with physician authorization – can contribute to better maternal health and offers minimal risk to the developing fetus" (p. 237).

Questions about the guidelines did not completely disappear. There was some suggestion that they might still be too conservative for highly active women (see for instance, Araujo, 1997; Clapp, 1996; Hale & Milne, 1996; Schnirring, 1997). James Clapp was one of the most outspoken in his belief that healthy, fit women were capable

of more vigorous exercise than provided in the 1994 ACOG guidelines. "The guidelines," he explained:

> advise that strenuous, prolonged, physical activity should be curtailed during pregnancy and recommend that this be accomplished by limiting the duration, intensity, and type of exercise, which should minimize these potential stresses. However, the data currently available do not indicate that this approach is necessary in healthy, well-conditioned, active women. (1996, p. S28)[189]

Elsewhere, he argued that while the guidelines were revised and liberalized to some degree and actually promoted the value of regular exercise during pregnancy, in philosophy and practical application "they are basically unchanged" with a continued focus on avoiding any possibility of risk (1998, p. 6). He further critiqued the extensive list of contra-indications to exercise provided by ACOG (1994), explaining that while several were legitimate (notably the ones falling under the category of acute illness), objective evidence to support many others was lacking - including the idea that women with multiple-birth pregnancies, a history of premature labour or multiple miscarriages should refrain from exercise (p. 151).

Conversely, there was also some suggestion that the revised ACOG guidelines might now be too vague and not provide enough guidance for women (Pivarnik, 1994; CASM, 1998). While supporting the guidelines, Pivarnik (1994) provided additional advice regarding appropriate heart rate levels for women (in light of the fact that the ACOG 1994 did not provide any),[190] and also noted that while no mention was made of a specific upper limit to maternal body temperature during exercise, "a pregnant woman should make every effort to maintain adequate thermoregulation" (p. 216). He concluded

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[189] He went on to outline the three fetoprotective adaptations that appear to occur when women continue regular exercise throughout pregnancy.

[190] He explained that while the ACOG recommends a target heart rate of 60-80% of maximum for women in their general guidelines (ACOG, 1992), previously sedentary women who become pregnant should aim for the low end of the range and those with experience could safely exercise at the high end.

that although the new guidelines would allow physicians more latitude with their advice, the greater flexibility meant that "there is an increased responsibility for both mother-to-be and her physician to design an individualised activity programme to meet specific goals" (p. 217). The concern was that physicians would be remiss in their duty and that women would direct their own activities. The pregnant exerciser still needed guidance, an idea that was clearly reflected in the Canadian guidelines, to which I will now turn.

Creating the Canadian Guidelines: Tools of Surveillance

Canadian researchers had been involved in exercise and pregnancy research since the early 1980s (see Bagnall et al., for instance) and several often-cited review articles on the state of knowledge regarding exercise during pregnancy had been published by a group working out of the Clinical Exercise Physiology Laboratory at Queen's University (with Larry Wolfe as coordinator) (Wolfe et al., 1989a; Wolfe, Ohtake, Mottola & McGrath, 1989b; Wolfe, Brenner & Mottala, 1994; Wolfe & Mottola, 1993). However, 'official' exercise guidelines put forth by Canadian institutions were limited to those outlined in a document published by Fitness Canada (1983) and were quite dated by the mid 1990s. As an aside, the guidelines put forth in the Fitness Canada publication "Exercise in Pregnancy" in 1983 do not appear to have inspired the same level of debate as the 1985 ACOG guidelines, despite the criticism that they were perhaps overly zealous in the promotion of aerobic exercise during pregnancy (without proper evidence that the benefits actually outweighed the risks) (see Bagnall et al., 1983). This may have been the result of several factors: the ACOG was (and is) a dominant institution or authority in women's reproductive issues in North America while Fitness Canada did not carry same weight behind it; Fitness Canada guidelines were presented more informally (as a user-

friendly book for women) as opposed to being framed as a "Technical Bulletin" and distributed to physicians and other health care providers to be used as the standard of care; Canadian society historically has been less litigious than the United States, so perhaps the creation of guidelines did not create the same concern that a 'standard' had been set.

The Canadian guidelines were updated in 1996 when the Canadian Society of Exercise Physiology (CSEP) and Health Canada co-published the *Physical Activity Readiness Medical Examination* (PARmed-X for Pregnancy), a screening tool to be used by physicians and midwives to assess the readiness of pregnant patients to initiate an exercise programme (and based on a series of research studies conducted in the Queen's University laboratory). Significantly, the *PARmed-X for Pregnancy* guidelines were created to "carry forward the original philosophy of Fitness Canada that pregnancy is a good time to establish healthy lifestyle habits and that previously inactive women are encouraged to begin exercise programs while pregnant" (Wolfe & Davies, 2003, p. 491).[191] In this sense, the Canadian guidelines for exercise in pregnancy appear to have had more of a promotional intent than the ACOG (1994) guidelines, likely reflecting the different approaches towards health promotion (and health care) taken by the Canadian and US government. Canada has had a universal comprehensive health care system since 1967 while the US system is privatized, and similarly there has been a strong political push for health promotion by the Canadian federal government as evidenced by the

[191] Indeed, the form stated that the postulated benefits of exercise during pregnancy included "improved aerobic and muscular fitness, promotion of appropriate weight gain, and facilitation of labour. Regular exercise may also help to prevent gestational glucose intolerance and pregnancy-induced hypertension" (CSEP, 1996, p. 1).

ParticipACTION campaign initiated in 1973. This stands in contrast to the more apolitical attachment shown in the United States (Cunningham, 1992).[192]

The primary function of the *PARmed-X for Pregnancy*, however, was to facilitate the "ongoing medical surveillance of exercising pregnant patients" (CSEP, 1996, p. 1). An important goal in the design, recall Wolfe and Davies (2003), was to establish communication between the pregnant woman, her health care provider monitoring her pregnancy and her prenatal fitness instructor (p. 491). The first two sections were to be filled out by the woman (contact info, general health status, state of pregnancy, current physical activity habits and intentions) while the physician was to complete the third section based on his or her clinical examination of the patient. The physician-portion included a checklist of absolute and relative contraindications (or risk factors) to exercise in pregnancy, followed by a recommendation to either approve or disapprove exercise. "If absolute contraindications are identified," noted the Canadian Association of Sports Medicine (CASM) in their review of the form:

> the risk to the fetus and to the mother far outweighs any of the exercise-related benefits identified. If relative contraindications are identified, in these situations, the safety of exercise must be assessed on an individual basis with careful medical surveillance. (CASM, 1998, p. 4)

Therefore, while the Canadian government promoted exercise during pregnancy, the potential risks involved were not forgotten and the *PARmed-X for Pregnancy* was part of the apparatus in the growing field of exercise and pregnancy science designed to help assess and control these risks or dangers. The participatory nature of the form meant that women were recruited to monitor their own behaviour, illustrating the productive (and disciplinary) nature of the power/knowledge complex in contemporary Canadian society.

[192] Cunningham notes that although there was a strong push behind setting health targets in the United States, there was no political commitment to national health promotion policies (as of early 1990s).

In line with the goal of monitoring and regulating the pregnant body, the *PARmed-X for Pregnancy* also included prescriptive recommendations regarding the appropriate type, intensity and amount of exercise (for both aerobic activity and muscular conditioning) in order to increase the likelihood of a beneficial pregnancy outcome. Unlike the ACOG guidelines (1994), a modified heart rate chart was provided (the upper end of the target zone was lowered by 5 bpm with the target heart rate representing about 60-80% of aerobic capacity for varying ages), although it was noted that "the best way to prescribe and monitor exercise is by combining the heart rate and rating of perceived exertion (RPE) methods" (CSEP, 1996, p. 2). Advice regarding exercise duration and frequency was also detailed, as it was suggested that healthy women should exercise for at least 15 minutes 3 times per week (up to a maximum of 5 days per week) and that previously sedentary women could progressively increase the duration up to 30 minutes.[193] The type of exercise recommended was "non-weight bearing or low impact endurance exercise using large muscle groups (e.g., walking, stationary cycling, swimming, aquatic exercises, low impact aerobics)" (p. 2). Jogging and other sports were not mentioned on the form, their absence implying that these activities are not safe. Indeed, because of its abbreviated format, the *PARmed-X for Pregnancy* did not provide a nuanced discussion of the current state of research surrounding prenatal exercise, which might have provided further insight into the issue and encouraged a more flexible interpretation of what was safe for women based on their individual fitness levels. Similar to the ACOG (1994) guidelines, women were advised to avoid exercising in warm/humid

[193] According to the PARmed-X, the second trimester was the best time for previously sedentary women to start a programme while previously active women could continue into the first trimester. The ACOG (1994) guidelines did not make this differentiation as programs for previously sedentary women were not mentioned specifically (the implicit message being that this population could engage in exercise at any time).

environmental conditions, activities which involved physical contact/danger of falling, breath holding (especially when lifting weights) and exercising in the supine position after four months.

The *PARmed-X for Pregnancy* received support from other Canadian organizations. In 1998 the Canadian Academy of Sport Medicine (CASM) released a position statement in which it concluded that "[t]he current data suggest that a moderate level of exercise on a regular basis during a low risk pregnancy has minimal risk for the fetus and beneficial metabolic and cardiorepiratory effects for the exercising pregnancy woman" (p. 1) and further recommended that "the *PARmed-X for Pregnancy* be utilized as the basis of safe and practical exercise prescription in pregnancy" (p. 1). A complimentary book, *Active Living During Pregnancy: Physical Activity Guidelines for Mother and Baby* (1999) was published by CSEP and Health Canada, which endorsed the *PARmed-X* guidelines and provided more detailed guidance on appropriate exercises. The advice provided in the Society of Obstetricians and Gynecologists of Canada (SOGC) publication *Healthy Beginnings* (SOGC, 2000) was also in accordance with the *PARmed-X for Pregnancy* recommendations and in 2003, the SOGC and CSEP co-published the first Canadian national guidelines for exercise during pregnancy (and the postpartum period) (see Davies, Wolfe, Mottola & MacKinnon, 2003). They were touted as the first ever guidelines for prenatal exercise to be supported by both obstetricians and exercise scientists, the first to be quantified using the evaluation of evidence guidelines (recommendations were assessed according to the Canadian Task Force on the Periodic Health Exam's "Evaluation of Evidence Criteria"), and they also endorsed the *PARmed-X*

for Pregnancy.[194] With respect to prescription, they were very similar to the *PARmed-X for Pregnancy* which, incidentally, had been updated in 2002. The prescribed intensity, duration and type of exercise did not change, but the frequency was decreased from a maximum of five times a week to a maximum of four. This change was based on a study conducted by Campbell and Mottola (2001) which found evidence to suggest that women who participated in structured exercise five or more times per week had an increased chance of delivering a low-birth weight infant (see Wolfe & Davies, 2003, p. 492-3).

It is worth noting that the Canadian guidelines, which were evaluated according to the ranking system of EBM, resulted in exercise guidelines that were more prescriptive (and slightly more conservative) than the ACOG guidelines that were not (overtly) assessed according to the same guidelines. We see then, how the differing 'rules of formation' underlying the creation of the guidelines resulted in differing prescriptions regarding appropriate behaviours and activities for the pregnant body. The differences between the ACOG and Canadian guidelines, both positioned as the 'official' standards of key medical organizations, illustrate the contingency of knowledge, that there is not one 'truth' about what is proper exercise.

Similar to the situation in the mid 1980s, the Canadian guidelines do not appear to have inspired controversy on the level of the ACOG guidelines. By the time Health Canada and CSEP released the 1996 *PARmed-X for Pregnancy*, there was more research on the issue, allowing for the creation of recommendations touted as being more

[194] The "Evaluation of Evidence Criteria" ranks evidence in the following manner (from most reliable to least): Level I: Evidence obtained from at least one properly randomized controlled trial; Level II-1: Evidence from well-designed controlled trials without randomization; Level II-2: Evidence from well-designed cohort (prospective or retrospective) or case control studies (preferably from more than one research group; Level II-3: Evidence obtained from comparisons between times or places with or without the intervention; Level III: Opinions of respected authorities, based on clinical experience, descriptive studies or reports of expert committees (taken from Davies et al., 2003).

evidence-based, which may have defused the situation. That said, interviews that I conducted with individuals involved in the field of exercise during pregnancy provided some evidence (albeit limited) that there may in fact be continuing debate around (or at least dissatisfaction with) the Canadian guidelines not articulated in the medical/scientific literature. One physician expressed disappointment that the Canadian guidelines included heart rates which, in her opinion, unnecessarily limited women's exercise experiences. She also noted that the inclusion of heart rates reflected the biases of one of the creators of the guidelines:

> tragically, the SOGC, because of [one of the researchers] and their personal beliefs, included heart rate [in their guidelines]...And we're the only jurisdiction in the world that does that...They have stepped back a little bit and said heart rate can be used as an adjunct to determine exercise intensity, however, still use the talk test. But I would personally have it [heart rate] removed completely....The reality is, somebody who is fit is going to get their heart rate to 135 in the warm up. They just are! You know (laughs). So they're sitting there with their heart rate monitor, they're freaking out. And pregnant women have enough to freak out about? I mean, Dr. Clapp's studies show that vigorous exercise is mile 24 of a 26 mile marathon in pregnancy.

Thus, even though the Canadian exercise guidelines for pregnant women are touted as being evidence-based and were created by the two main Canadian exercise and obstetrical organizations (CSEP and SOGC, respectively), the current guidelines continue to reflect, according to this interview participant, some of the personal beliefs and biases of the creators.[195]

Health care professionals are not the only ones questioning aspects of the guidelines. A personal trainer who closely follows the Canadian guidelines explained that she is sometimes challenged by clients who are aware of the differences between the ACOG and SOGC with respect to recommended duration and frequency:

[195] It appears that the change in the number of allowable exercise sessions per week and the need to continue to monitor heart rates was informed by the research of one of the contributors to the guidelines.

> ...the two biggest differences [in] the ACOG and the SOGC guidelines are that SOGC are still maintaining *up to* 30 minutes and *up to* five days a week. Whereas the, whereas ACOG is saying *at least* 30 minutes *most* days of the week. And so women will read one thing on the ACOG and then they maybe – it's not very common – but they might say then, challenge me in class because well, you know, I read on the website that the guidelines say I can be exercising for at least 30 minutes....And I might have told them in class that we're going to do a maximum of 30 minutes not including warmup and cool down.

She went on to explain that she closely follows the Canadian guidelines for legal reasons:

> I'm not saying the Americans are wrong and we're right. I follow the Canadian guidelines because I'm in Canada and that's just the most ethical thing for me to do...the way I always look at it is if I were ever to have to go to court - and I've never had to - I want to believe 100% in what I was doing...I didn't do the research that the Americans are using to have these different guidelines and I don't feel comfortable enough to stand up there and say "I whole heartedly believe the American guidelines are right and the Canadian are wrong." So, the Canadian are the more conservative one. I prefer to go with the more conservative to be safe.

It appears that statements regarded "how much" and "how far" that are articulated in the guidelines *do* sometimes impact the exercise practices of pregnant women who attend fitness classes in which the guidelines are used, due in large part to trainer's concerns about legal liability. Since this is only one interview, I do not wish to suggest that all fitness trainers share this participant's attention to the legalities of exercise during pregnancy, and in fact, both of the interviewees cited above noted that many physicians and personal trainers are not even aware of the *PARmed-X* or the SOGC guidelines. Additional enquiry into the Canadian guidelines is required to further elucidate key issues associated with their production, as well as how these guidelines bring together disciplinary and juridical forms of power. That is, to what extent do health care professionals decide to 'enforce' the knowledge put forth in the guidelines (disciplinary tools) out of concerns about the legal risks of not doing so (i.e., punitive measures)?

'Important Gaps Remain'

By the late 1990s exercise physiologists and obstetrician/gynecologists had weighed the risks and benefits of prenatal exercise and come to a general agreement that moderate exercise was safe for healthy pregnant women who were free of a standardized list of contra-indications. The list of absolute and relative contra-indications allowed women to be 'risk profiled' based on such factors as their age and pregnancy history. Pregnancy and exercise had grown into a specialty area with its own body of knowledge. Guidelines and checklists (part of what Foucault would call 'apparatus' in the regulation of the body) had been created by professional organizations such as the ACOG, SOGC and CSEP/Health Canada and endorsed by other professional groups such as the ACSM and CASM (although dissenting opinions existed within the medical and research community). The apparatuses were designed to regulate the practices of the pregnant woman and ensure that both she and the fetus would be safe from injury. Exercise guidelines produced by these organizations were less restrictive than those put forth by the ACOG in 1985, but ultimately, the pregnant body and the fetus were still constructed as potentially 'at risk.'

Given the perceived need for prudence where the pregnant exerciser is concerned, a common refrain in research articles in the mid to late 1990s was that there remained substantial gaps and limitations in the body of knowledge surrounding exercise during pregnancy, and that more research was needed to refine advice concerning appropriate exercise limits for women (see for instance Araujo, 1997; Artal, 1996; Hale & Milne, 1996; Hartmann & Bung, 1999; Khanna, 1998; Stevenson, 1997a; Wang & Apgar, 1998). In the introduction of a special issue of *Seminars in Perinatology* on 'Exercise and

Pregnancy' published in August 1996, Artal noted that "[t]he lack of consistent methodology (protocols, exercise modality, equipment prior exercise history, level of fitness) are major obstacles in reaching meaningful conclusions [regarding prenatal exercise]" (Artal, 1996, p. 211). In the same special issue, Dye and Oldenettal (1996) reviewed literature regarding physical activity and the risk of preterm labour and argued that methodological difficulties precluded clear generalizable findings in this area, concluding that "without larger, population-based randomized studies, clinicians will remain unclear about the potential risks and/or benefits related to gestational duration of maternal exercise in their populations" (p. 339). Stevenson (1997a) identified conflicting or limited data in several additional areas including the impact of maternal exercise on birthweight, fetal heart rate (a common measure of fetal distress), fetal hyperthermia, the incidence of miscarriage, the course of labour, and maternal injury. She went on to observe that:

> Important gaps remain in our knowledge of exercise and pregnancy...The previous guidelines seem increasingly too restrictive for previously fit and healthy exercising women. There is likely an optimal and safe level of exercise, but this level is still not clearly established. (p. 103)

Ironically, the very 'riskiness' of the pregnant body meant that the research studies conducted were (and are) limited by ethical anxieties about the safety of the fetus such that questions about 'how much' and 'how far' cannot be answered with the absolute certainty that appears to be required where the female reproductive body is concerned. This major methodological limitation is then compounded by other methodological shortcomings identified by researchers (small sample size, lack of randomized trials), with the result that the identification of the 'optimal zone' remains elusive and a cloud of caution continues to linger over prenatal exercise advice.

Into the Twenty-first Century: A Shift in Risk Discourse

Despite continued concerns about the risks of exercise during pregnancy, a shift in the discourse became increasingly evident in the early years of the twenty-first century. In 2002, the ACOG released new guidelines which were summarized in an editorial featured in the *Physician and Sportsmedicine*: "[i]n a nutshell, the older recommendations state that healthy pregnant women *can* exercise; the recent recommendations suggest that healthy pregnant women *should* exercise" (Schnirring, 2002, p. 9, emphasis added). Indeed, the guidelines clearly stated that in the absence of medical or obstetric complications, "30 minutes or more of moderate exercise a day on most, if not all, days of the week is recommended for pregnant women" (ACOG, 2002, p. 171) and for the first time, it was recognized that exercise in pregnancy may help in the prevention and treatment of gestational diabetes (p. 171).[196] And while moderate prenatal exercise had long been promoted by the Canadian government, in the 2003 joint SOGC/CSEP guidelines the risk of *not* engaging in prenatal exercise was stressed:

> [w]omen and their care providers should consider the risks of *not* participating in exercise during pregnancy, including loss of muscular and cardiovascular fitness, excessive maternal weight gain, higher risk of gestational diabetes or pregnancy-induced hypertension, development of varicose veins and deep vein thrombosis, a higher incidence of physical complaints such as dyspnea or low back pain, and poor psychological adjustments to the physical changes of pregnancy. (Davies et al., 2003, p. 2, emphasis added)

The shift in discourse evident in the American and Canadian guidelines for exercise during pregnancy was one of the first (and most obvious) indications that professional

[196] Also promoted was exercise for previously sedentary women and those with medical obstetrical complications, pending medical evaluation and clearance. Other changes/additions included: three new tables listing absolute contraindications to exercise (which include a few new ones such as heart disease, lung disease, orthopedic limitations), relative contraindications and warning signs for termination of exercise; more sports specific guidance; advice for competitive athletes (that they should be closely supervised by their physicians). Similar to the 1994 guidelines, the 2002 recommendations do not include target heart rates, and it is also acknowledged that a strong basis for recommendations is lacking on the effects of strenuous exercise on fetal growth and on core temperature.

organizations were viewing maternal exercise in a different light. Individual researchers had been suggesting this in the 1990s but publication in the official guidelines seemed to make it more of a 'fact.' And interest in the possible health benefits of prenatal exercise for both mother and fetus has only intensified in recent years. For example, in a PubMed database search I found 71 studies focusing on the protective role of prenatal exercise which were published from 1990 to present. About a quarter (or 27%) of these studies were published between 1990 and 1999 and 73% were published from 2000 to present. Strikingly, 52% were published in the past 3 years.

The rise in interest in the health benefits of exercise during pregnancy appears to be linked to the fact that pregnancy has been identified as a major contributor to the 'epidemic of obesity' in Western society (Murphy Paul, 2008). It is argued that women are beginning pregnancy overweight, are gaining too much weight during pregnancy and are failing to lose the extra weight post-pregnancy (Catalano, 2003; Reece, 2008; Symonds & Gardner, 2006). Within the health care and medical community there is growing concern about this situation as obesity and overweight during pregnancy have been linked to numerous health risks for both the mother and fetus (and the risk is said to increase with each point increase in the mother's BMI)[197] (see Gray, Power, Zinberg & Schulkin, 2006; Guelinckx, Devlieger, Beckers, & Vansant, 2008; NRC & IOM, 2007; Olson, Strawderman & Dennison 2008; PACTS, 2006; Rasmussen, Chu, Kim, Schmid & Lau, 2008; Siega-Riz & Laraia, 2006; SOGC, 2007). Overweight and obese women are said to be at increased risk for developing GDM (a form of diabetes onset or first

[197] There has been a significant rise in the amount of research on obesity during pregnancy over the past several years (a shift from previous and almost exclusive focus on dangers of lack of weight gain during pregnancy). On October 22, 2008, I conducted a PubMed Search using the terms 'Obesity, pregnancy and birth outcomes'. Of the 168 studies identified, 140 or 83% were published from 2000 onwards and about 103 of 168 (61%) from 2005 onwards.

diagnosed during pregnancy which is in turn a risk factor for poor pregnancy outcomes), pregnancy-induced hypertension (pre-eclampsia)[198] and for requiring a Caesarian section, a procedure which is costly to the health care system and increases maternal morbidity.

The fetus is also said to be at risk. Researchers have identified a link between obesity during pregnancy and increased risk of still birth and birth defects (ACOG, 2005). The concern is such that in 2005 the American College of Obstetricians and Gynecologists (ACOG, 2005) released a position statement suggesting that obese women get preconception counseling in part to convince them to lose weight *before* getting pregnancy. It has also been suggested that clinicians withhold fertility treatment for obese women (Balen & Anderson, 2007). As well, it is postulated that women who are overweight or obese during pregnancy are 'programming' the fetus to be an overweight/obese adult. Obesity and/or diabetes during pregnancy are thought to create a fetal environment that alters the metabolism of the fetus and increases its risk of developing diabetes and childhood overweight/obesity (Huang, Lee, & Lu, 2007; Oken, Taveras, Kleinman, Rich-Edwards & Gillman, 2007; Olson et al., 2008; NRC & IOM, 2007).[199] In this view, women are essentially breeding obesity and other negative health outcomes, and are positioned as personally responsible not only for the health of their

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[198] Hypertension during pregnancy is also termed preeclampsia. Preeclampsia can cause growth retardation of the fetus and premature delivery due to insufficient utero-placental vascularization (Voto, Lapidus & Margulies, 1999). It can also increase the mother's risk of stroke or impaired kidney function, impaired liver function, blood clotting problems, pulmonary edema (fluid on the lungs), and seizures. In severe forms, maternal and infant death can result (see http://www.preeclampsia.org/FAQ.asp#eleven accessed October 27, 2008).

[199] A study by Oken et al. (2007) found evidence to suggest that gestational weight gain (GWG) is an independent risk factor for childhood overweight. More specifically, women with GWG in excess of the 1990 Institute of Medicine (IOM) recommendations are thought to increase the risk of childhood overweight at age 3 – regardless of the mother's pre-pregnancy BMI (i.e., 'normal' weight women who gain too much are at risk of 'breeding' obesity). The authors suggest that the IOM needs to lessen its allowed weight gain recommendations and indeed, the IOM guidelines (along with the Health Canada guidelines) are now under review (see http://www.iom.edu/CMS/3788/48191.aspx?printfriendly=true ; retrieved August 18, 2008).

own offspring but also for the cost to the community of an unhealthy future population (Noble, 2006, p. 474).[200]

In the articles that I reviewed, it was generally suggested that while there are numerous risk factors for the development of 'maternal-fetal diseases' of pre-eclampsia, GDM and obesity (and that factors interact in ways that researchers do not understand), one modifiable risk factor in this complex mix is physical inactivity (see for instance Mottola, 2007). Physical activity before and/or during pregnancy is then positioned as a low cost intervention that can improve prenatal care and prevent future illness in both the mother and child.[201] In this view, exercise during pregnancy more firmly enters the realm of risk epidemiology: through statistical analysis of the health of the population, physical inactivity has been identified as a risk factor which will increase the probability that a woman will develop various maternal fetal diseases. Prenatal exercise thus becomes a normalizing practice to help regulate the individual and social body.

Exercise during pregnancy has always been about the health of two individuals but the emphasis was on not harming the fetus or the mother - and perhaps allowing the mother to maintain her previous fitness levels, improve her psychological well-being and have an easier labour with a quicker recovery. With the new focus on physical activity to prevent and treat maternal-fetal diseases, being 'fit for two' becomes a strategy for

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[200] On several occasions I came across comments within the medical literature suggesting that we are witnessing a "vicious cycle of maternal and childhood obesity" (Catalano, 2003) that is "rapidly spiraling upwards" (Reece, 2008, p. 23) and that must be stopped (see Guelinckx et al., 2008; Oken et al., 2007).

[201] In late April of 2005, the ACSM convened a Scientific Roundtable (which included both US and Canadian researchers) to "consider the role of physical activity in a more traditional chronic disease prevention light, for both mother and offspring" (ACSM, 2006, p. 989). They concluded that, based on research to date (albeit limited), physical activity during pregnancy appears to help to prevent and/or treat preeclampsia, gestational diabetes, chronic musculoskeletal conditions, improve mental health throughout gestation, as well as produce health benefits in children of women who exercise (i.e., produce smarter and fitter children). With respect to the latter point, the work of James Clapp was referenced - although it was noted that research should be interpreted with caution due to methodological difficulties (see Clapp, 1998; 2000).

ensuring (and improving) the health of both mother and child, illustrating the manner in which women's health remains a form of biopower and women's fitness part of the apparatus of modern day governmentality. Indeed, in this context exercise during pregnancy becomes a tool to help control the health of the population (especially segments of society calculated to be 'at risk') and decrease health care costs – the latter being a primary concern in a population health model which Ann Robertson (1998) argues is increasingly evident in Canadian healthcare policy decisions.

Conclusion

An examination of the scientific enquiry into maternal exercise demonstrates how the perceived risks of this activity have been shaped by the social, political and economic context in which they were produced. In the 1980s, women's participation in exercise while pregnant countered long-accepted beliefs about the appropriate behaviour of pregnant women and symbolized women's larger struggle to gain control and freedom over their (reproductive) bodies. The exponential rise in research on the issue during this time (with the aim of defining the safe limits) was therefore not an apolitical quest for knowledge, and the debates which ensued reflected wider societal debates about appropriate roles for women as well as what 'counts' as authoritative knowledge or 'truth' within the medical community. Verbrugge (2002) similarly argues that concerns about menstrual disorders in active females which began in the early 1970s and grew rapidly in the ensuing years were (and are) part of a broader debate within political and intellectual circles about women's 'basic' nature, debates which arose in the late 1960s and the 1970s with advances in feminism, the women's health movement, and changes in women's work and family roles. The irony here, of course, is that concerns in the

scientific community about exercise and pregnancy were shared by pregnant women who wanted researchers to generate sound scientific guidelines which they could follow to keep their baby safe, illustrating the productive nature of power. As evidence mounted that some exercise during pregnancy is safe for most women, the focus of the research shifted and researchers (motivated by fears about an obesity epidemic) are examining the potential of physical activity in pregnancy to treat and prevent obesity-related problems during pregnancy.[202]

In this chapter I have also attempted to 'excavate' the rules of formation underpinning the creation of official exercise and pregnancy guidelines. I have illustrated how the privileging of a positivist paradigm within the medical community led to debates about appropriate exercise advice. In light of inconclusive and methodologically unsound evidence, some physicians felt that alternative forms of knowledge (such as case studies, women's own experiences) that supported the safety of exercise during pregnancy should be ignored and prescribed extreme caution. This position was challenged by others within the medical community illustrating that not *all* members subscribe to this rigorous positivist paradigm regarding what counts as truth. That said, it was not until the production of further evidence that was considered to be more methodologically sound that the official guidelines were revised, illustrating how objective science remained the privileged way of knowing within the medical organizations, especially in Canada. These guidelines then serve as the standard of care within the fitness profession, followed by fitness trainers concerned with issues of legal liability. While juridical forms of power

[202] Not wishing to be too uncharitable, I would suggest that professional power may be another motive behind the shift in focus to the benefits of exercise during pregnancy given that the accumulation of 'acceptable' evidence that maternal exercise (even vigorous exercise) is safe means researchers in the field must find new problems and issues to explore to justify funding – and their very existence as researchers and academics.

have not been a focus of this chapter, we see how the tenets of law (based on a system of punishment) combine with the practices of medicine (based on a system of discipline and surveillance) (Rose & Valverde, 1998). In short, the continued inability to prove or disprove several of the hypothetical dangers to standards deemed acceptable under the rules of evidence-based medicine means that cautions and anxieties regarding exercise during pregnancy persist. For example, the Cochrane Reviews on pregnancy and exercise (which are created by the Cochrane Collaboration, an organization that bases its assessments of research on the tenets of evidence-based medicine), asserts that the medical community cannot make *any* recommendations for or against exercise during pregnancy (Kramer, 2000; Kramer & McDonald, 2006).

My examination of the 'rules of formation' of exercise and pregnancy guidelines may be met with a question or critique: Is it not better to have exercise guidelines based on research conducted according to the rigorous standards of the scientific community (which have, albeit after several years of debate and much research, led to more permissive guidelines) rather than exercise prescriptions such as those formulated in the late nineteenth and early twentieth century that were based on pseudo-science? Taking a 'modern' view, one could say that the former are 'better' because there is more evidence behind them and they are less restrictive; however, taking a poststructuralist or Foucauldian view, one would point out that *both* function as disciplinary and regulatory mechanisms, creating norms and standards to which women must aspire (G. Rail, personal communication, November 12, 2008). Indeed, with shifts in knowledge, the emphasis is now on the risk of not exercising during pregnancy and women are being encouraged to discipline and monitor their bodies in this respect. Moreover, research

accepted as 'truth' according to the rules of evidence based medicine project an image of objectivity, obfuscating the social and political context in which research is undertaken or the "always-present subjective elements of scientific enquiry" (Lambert et al., 2007, p. 2616; Holmes et al., 2006; Johnson, 1997; Murray et al., 2007; Oakley, 1989).

A key theme to emerge in my examination of scientific discourse about exercise and pregnancy since the 1980s is that of 'risk' – albeit in two different configurations. The first is akin to the discourse of danger that has surrounded statements concerning exercise and pregnancy since the late nineteenth century. Much of the research conducted in the 1980s and 1990s (and still in evidence today) focused on the risk or probability that there would be a negative fetal outcome if women exercised too rigorously. Some women are identified as more 'at risk' of negative outcomes if they exert themselves while pregnant – the risks factors associated with negative outcomes are outlined in the official exercise guidelines as relative and absolute contraindications and are typically detected through clinical examination of the pregnant patient. In recent years, however, physical inactivity *itself* has been identified as a risk factor in the development of 'maternal-fetal diseases' such as obesity, GDM and pre-eclampsia. In this context, moderate physical activity during pregnancy becomes a form of disease prevention or treatment – associated with 'health' and part of the solution to current fears of a rising epidemic of obesity and other chronic illness.

The position of exercise as both problem and solution in the governance of the pregnant body is not entirely new and as previously discussed was in evidence in the early twentieth century. The variables in the governmental equation have shifted, however. Although cautions remain, exercise is viewed as less dangerous than it was fifty

or sixty years ago, and with the rise of epidemiology the assertion that physical activity can reduce the risk of maternal fetal disease and contribute to the health of the mother - and particularly the child - holds more sway. Thus, exercise and pregnancy is now less about 'discipline and punish' and more about 'screen and intervene' – a way to reduce the chance of future chronic illness in a woman's offspring (N. Rose, Law & Society Lecture, May 14, 2008). Finally, the objective underpinning the governance of the active pregnant body has changed from a concern with the health and strength of the nation-state to a concern with individual unhealthy bodies and the costs that they incur (Rose, 2001).

The perceived risks of exercise during pregnancy may have shifted over the past three decades, but the one constant which remains is the anxiety that surrounds the reproductive body and the need to define, monitor and regulate it. This view of pregnancy sustains inquiry into the issue of exercise during pregnancy, further pathologizing the pregnant body as its inherent riskiness is used as the rationale for further research funding. Perhaps even more importantly, these discourses inform women's pregnancy experiences as scientific findings are disseminated in the form of research articles (that the layperson increasingly has access to in the age of the internet), exercise guidelines, and articles and books in the popular press. In the next chapter, I move from an examination of the discourses produced within the scientific community and examine what types of knowledge or 'ways of knowing' dominate the field of popular culture and how this discourse is put to use in the regulation of the pregnant body.

CHAPTER SEVEN

Fit For Two?: Citizenship, Consumerism and Prenatal Exercise in a Neo-liberal Society

In this chapter I examine the discursive construction of exercise and pregnancy and, by extension, 'fit motherhood' within a range of women's magazines and pregnancy manuals published from the start of the twenty-first century to 2008. A central aim is to better understand how the discourses identified in the previous chapters are put to use in the operation of power. An examination of the popular literature is particularly instructive because in contemporary Western society, health promotion strategies are no longer confined to the medical office or the hospital ('traditional' sites for treating the sick) but rather the health-promoting individual is now expected to "take note of and act upon the recommendations of a whole range of 'experts' and 'advisers' located in a range of diffuse institutional and cultural sites" – with consumer culture being a central site of health-related knowledge (Bunton & Burrows, 1995, p. 208).

Fitness texts, in particular, have proven to be a lucrative sub-market of the larger multi-billion dollar health and fitness industry – especially since the 1990s when growing discretionary incomes and the advent of niche marketing "created conditions for the further intensification of the production of lifestyle publishing and periodicals" (Smith Maguire, 2002, p. 451).[203] The number of fitness and health magazines nearly tripled between 1988 and 2000 and the amount of press coverage dedicated to physical fitness has increased more than six-fold in the same approximate time span (Smith Maguire,

[203] The success of the fitness industry can be attributed, in part, to the status of the body in contemporary consumer culture as a 'project' to be "worked at and accomplished as a part of an individual's self identity" (Shilling, 2003, p. 4). Treating the body (and self) as a reflexive project, suggests Giddens (1991), is a way to gain a sense of control in advanced modernity characterized by a decrease in traditional knowledge and customs, increase in risk, the realization that all knowledge is tentative and the increasingly mediated nature of experiences.

2002, p. 451-2). A primary aim of fitness texts, notes Smith Maguire (2002), is to educate readers - about the exercises themselves but also the benefits of incorporating exercise into one's lifestyle as a way to reduce health risks, improve one's looks, self-esteem and ultimately, chances of success in life. As such, success of self-improvement falls upon the shoulders of the individual - and their ability to 'consume' health.

Pregnancy and childbirth (and 'motherhood' more generally) also emerged as a profitable market in the final two decades of the twentieth century such that reproduction has increasingly come to be construed in terms of *consumption* (Taylor, 2000). The profitability of reproduction is related in large part to the current era of what Lee (2008) has termed 'intensive motherhood' in which pregnant women and new mothers are under increasing pressure to manage an ever-growing number of risks (to their fetus and new baby, respectively) in order to be a 'good' mother (see also Lupton, 1999; Ruhl, 1999). The very 'riskiness' of the pregnant body, in particular, makes it a 'fertile' site for entrepreneurs who create and market products to help a woman personally manage her pregnancy risk. Couples with the financial means can pay for a range of prenatal testing procedures to ensure they have a 'normal' child, and new reproductive technologies (NRTs) allow individuals with fertility issues to conceive ('purchase' pregnancy), also opening up the possibility of creating genetically-enhanced 'designer babies'.[204] In addition to these somewhat 'non-traditional' acts of consumption, pregnant women can also choose the provider and setting for prenatal care and birth, attend a number of prenatal classes/courses (from exercise to breastfeeding) and choose from a variety of self

[204] Some critics view these consumer-oriented practices as a 'backdoor to eugenics' (Remennick, 2006, p. 22). In this view, the 'new eugenics' of the twenty-first century is no longer the provenance of state policies which encouraged the 'fittest' to reproduce (and segregated the 'feebleminded') but rather is characterized above all by "individualism and consumer choice," the domain of wealthy private consumers wishing to maximize the life chances of their children (Burdett, 2007, p. 8).

help literature that provides advice on how to reduce the numerous risks associated with pregnancy and childbirth (Taylor, 2000, p. 405). The latter is of particular interest given the focus of this chapter, and feminist scholars have demonstrated how these texts construct the pregnant woman as personally responsible for managing the risks associated with pregnancy in order to be a 'good' or 'fit' mother (see Jette, 2006; Marshall & Woollett, 2000; Ruhl, 1999).

In a neo-liberal society governed by the logic of risk (Giddens, 1991), exercise during pregnancy occupies the intersection of these two lucrative markets (fitness and pregnancy). The promotion of maternal exercise in consumer culture is not new, of course. Over a hundred years ago Bernarr MacFadden, one of the founders of the physical culture movement (and industry) in North America, advocated the benefits of calisthenics during pregnancy in *Cosmopolitan* magazine (see April, 1903, p. 712) and as I discussed in the previous chapter, during the fitness boom of the 1970s and 1980s, various articles and books were published which encouraged pregnant women to be physically active. The pregnancy fitness industry, however, emerged as a niche market in the 1990s and has virtually exploded in the twenty-first century. Entrepreneurs have capitalized on the shift in medical ideas which position prenatal exercise as a way to help women have a healthier pregnancy and baby, giving 'birth' to an entire industry replete with pregnancy fitness gyms, books, DVDs, maternity workout wear, and a lifestyle magazine devoted to the 'fit' pregnant woman (*Fit Pregnancy* which began publication in 1995). A search of the Vancouver Public Library database and the 'Amazon' website (www.amazon.com), for instance, revealed that while 5 books were published on the

topic in the 1980s and 11 in the 1990s, 52 books were released between 2000 to present (10 from 2000-2002 and 42 from 2003-2008).

The texts that I examine in this chapter are pregnancy and exercise related articles found in a variety of popular magazines (*Shape*, *Fit Pregnancy*, *Runner's World*, *Parents*, *Baby Talk*, *Health*, and *Prevention*) and three pregnancy advice manuals (*What to Expect When You're Expecting*, *Understanding Pregnancy and Childbirth*, and *The Mother of All Pregnancy Books*). Although from a variety of genres, the selected texts fall under the rubric of 'service journalism,' a form of news media which provides its audience with information and advice about the problems of everyday life. Eide and Knight (1999, p. 532-3) explain that while service journalism has traditionally addressed two main types of everyday problems, grievance and risk, service journalism is increasingly framing grievances as 'risk.' They explain that:

> whereas grievances imply a life that is already complete but temporarily side-tracked, risks conduce to a view of life as an ongoing, incomplete project that opens itself up to new and better forms of positivization (enhancement, refinement, improvement, growth, etc). (p. 533)

Because 'risk' deals in terms of potentialities and calculations, and (in theory) is infinitely expansible, it is an endless resource that can be tapped by entrepreneurs who construct an object or behaviour as 'risky' and provide advice on how to manage this risk. The risk-oriented advice of service journalism, note Eide and Knight, fits well with what Wernick (1991) has termed promotional culture.[205] Promotional logic, they argue, "extends beyond the purely economic sphere to the development of modern,

[205] Promotionalism results from the evolution of marketing and advertising which now blurs or collapses the distinction between the commodity and its signification, creating a multilateral web of positive, reversible associations (an endless chain of promotion or vortex of publicity). In this view, the symbolic, aesthetic values of commodities are positioned as aspects of the continuous enhancement and stylization of self and life.

institutionalized practices of socialization that attempt to instill in individuals the will and ability to model their conduct in normalized, detailed and self-validating ways" (Eide & Knight, 1999, p. 533). The risk-oriented discourses of service journalism place a similar emphasis on potentialization, striving and self-empowerment, such that "risk discourse promotes ways for the individual to overcome threats and dangers, and become... the hero of his or her own life" (ibid.).

In what follows I discuss three concepts identified through my examination of the texts outlined above, illustrating how they connect under the theme of 'risk' and work together to construct a particular type of body: the responsible, risk-avoiding mother. The first concept, *fit for two*, concerns the risk of physical inactivity and relates to the neo-liberal emphasis on taking personal responsibility for one's health, in this instance, being 'fit for two.' The second, *danger of exercise*, relates to the risk of harming oneself and the fetus through exercise and speaks to the long-standing concern with 'how much and how far' the pregnant woman should push herself. These first two concepts provide evidence to suggest that objective scientific knowledge (particularly that endorsed by central medical organizations) is a dominant 'way of knowing' about the pregnant body and exercise within the texts reviewed. There was evidence, however, of another way of viewing the female body that is more specific to consumer culture - the privileging of the feminine body ideal. This trend is captured in the final concept that I identify, the *yummy mummy*. This concept does not fall under the category of medical knowledge, per se, but works in conjunction with the discourse of objective science to promote a certain lifestyle for which the 'fit' mother should strive.[206]

[206] The terms "several" and "a few" are used frequently throughout the presentation of results to quantify how many articles supported a finding or observation. "Several" indicates that 3-6 articles conveyed an idea

Fit For Two: 'Sweat For Your Baby's Sake'

As was discussed in the previous chapter, a number of benefits of exercise during pregnancy have been proposed over the past two decades by individuals in the medical and scientific community (and disseminated in the popular literature). These include: increasing a pregnant woman's emotional well-being (by reducing stress and improving self-image); increasing energy levels; reducing pregnancy-related discomforts (i.e., back pain, tense muscles, constipation, insomnia); facilitating a shorter labour and easier delivery (with less need for medical interventions)[207]; decreasing recovery time and helping the postpartum woman regain her pre-pregnancy figure. Some or all of these benefits were commonly listed in much of popular literature that I reviewed, but increasingly evident was the suggestion that exercise during pregnancy has additional health benefits for the mother and baby, namely helping to treat and/or prevent 'maternal-fetal diseases' such as high blood pressure (pre-eclampsia), gestational diabetes mellitus (GDM) and overweight/obesity.

While there were earlier examples of such discourses (the October 1992 issue of *Health*, for instance, cited a study suggesting that moderate exercise during pregnancy helped to decrease blood sugar in women with GDM without an insulin shot – see Franklin & Griffin, 1992), the emphasis has increased in the past three to five years, mirroring the production of these knowledges in the scientific realm. In this section I focus not only on what advice is presented with regards to being 'fit for two,' but also

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while "a few" means that one or two expressed a certain opinion. I also use terms such as "typical" and "a majority" or "much of the literature" by which I mean that most of the articles in my sample (that were relevant to the issue in question) supported a certain idea. When I came across notable exceptions (what Seale has termed 'negative' examples) I discussed them in more detail.

[207] There has been disagreement on this point within the medical community due to lack of evidence, but it was generally agreed that exercise could help women better deal with the pain of labor.

how it is presented in the popular texts: as 'fact' with little discussion of the potential difficulties of transferring epidemiological risk knowledge into the clinical realm (see Gifford, 1986; Weir, 2006)[208] or the methodological limitations of the research (a somewhat paradoxical turn when compared to the centrality of evidence-based standards within the scientific community).

The 'fit for two' discourses were often presented in the 'news' section of popular women's magazines as a short excerpt or summary of a medical study, often with a catchy title urging the reader to 'get moving.' The Dec 2003/Jan 2004 issue of *Fit Pregnancy*, for instance, was headed by the title "Sweat? Yes!" followed by the explanation that:

> Exercising during pregnancy makes you feel good; now research shows it may be crucial to your health. In a study reported in *Hypertension*, women who engaged in any exercise during their first 20 weeks had a 35 percent-reduced risk of developing preeclampsia, a serious complication of pregnancy characterized by high blood pressure. (Acosta & Strote, 2003/2004, p. 25)

In the Aug/Sept 2005 edition of the same magazine, the reader was entreated to "Sweat for your baby's sake" because "exercise can help prevent pregnancy complications" (Kritz, 2005, p. 28). It was explained that high cholesterol has been linked to such pregnancy complications as preeclampsia and gestational diabetes and that researchers recently found that cholesterol was lowest in women who exercised more than an hour each day in the first trimester. The same study was reported in the March 2005 issue of *Prevention* in an excerpt entitled "Stay active for healthier cholesterol" because "high cholesterol during pregnancy can increase the risk of gestational diabetes and pre-eclampsia" (Horton, 2005, p. 129).

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[208] Gifford notes that the temptation may be to read risk factors (based on statistical measures of a population) as equivalent to "objective clinical signs of disease" – and to proceed with invasive procedure based on this assumption (p. 222).

And it was not just the pregnant woman who was advised of the benefits of exercise in reducing the risk of GDM and high blood pressure, as several magazines cited research suggesting that women who exercised the year *prior* to conception also decreased the risk of developing these complications (see Reid-St. John, 2003 in *Health*; "Active Mom," 2006 in *Prevention*; "Is Your Workout," 2006 in *Shape*). The news section of *Health* (Reid-St. John, 2003) presented readers with the title: "Sweat your way to a healthy pregnancy: move now to protect baby (and you) later" and followed with findings from a new study suggesting that:

> when you're trying to conceive, you need to get physical – and not just in the bedroom…working out up to a year before you become pregnant can reduce the risk of pre-eclampsia, dangerously high blood pressure that can be deadly to both mother and child. (p. 82)

The article went on to explain that the researchers found that "women who had performed any kind of exercise at all during the year before they conceived were an average of 33 percent less likely to develop pre-eclampsia than those who were sedentary" while "women who remained active during their pregnancies reduced their risk by an average of 41 percent" (p. 82). The article concluded with the ominous warning: "consider this: there's no effective way to get rid of pre-eclampsia once you have it. So don't just prepare for pregnancy with vitamins – get out there and get moving" (ibid.). Similarly, in the "News and Trends" section of the June 2006 edition of *Prevention*, readers were presented with the title "Active mom, healthier pregnancy" and warned that "women entertaining the notion of motherhood should start working out – now." The short excerpt went on to explain that:

> women who performed the most vigorous exercise during the year before pregnancy were 81% less likely to develop gestational diabetes – a condition linked

> to abnormally large babies and difficult labor – than their sedentary peers; moderate exercisers had a 59% lower risk. (p. 46)

The reader is thus urged to not only train during pregnancy but to train pre-pregnancy. Even if she is merely *thinking* about getting pregnant, she needs to engage in body work to begin her preparation for motherhood.

In the above excerpts, the creators of the popular texts refer directly to statistics regarding the probability of developing pregnancy complications such as GDM or preeclampsia (and how exercise can reduce this risk), illustrating that exercise during (and before) pregnancy has entered the realm of epidemiology – disease control at the population level. When dealing with risk at the epidemiological level, note Petersen and Lupton (1996), interventions are no longer based on the presence of concrete symptoms but rather the statistical *probability* that illness or disease will occur based on the presence of risk factors, thus expanding the category of what/who is considered to be 'at risk.' And as Gifford (1986) reminds us, when epidemiological risk knowledge is inserted into the clinical setting, the doctor must translate generalized knowledge (based on statistical measures of a population) to the treatment of a specific individual, deciding to what extent to treat a statistic as a 'reality' that requires intervention. Indeed, the texts cited above present the scientific statistics in such a way as to construct *all* women as potentially at risk of developing GDM or pre-eclampsia and moderate exercise as an intervention to help reduce this risk - despite the fact that epidemiologists do not fully understand the way that risk factors interact in the development of these conditions (see previous chapter). This broadening of the categorization of who is at risk for pregnancy complications is symptomatic of pregnancy in contemporary Western society. As Ruhl (1999) notes: [t]here is no 'no risk' category. Threat is everywhere; no one is entirely

safe, merely more or less statistically vulnerable" (p. 101). With respect to the issue of exercise during pregnancy, medical authority and scientific 'fact' is taken up (profitably) by the creators of the magazines to rally the rational subject/consumer to take action (i.e., get moving!) to control her risk. The risk-oriented advice supplied by the magazines thus acts as a form of disciplinary knowledge, subtly persuading individuals that a certain way of behaving or thinking is appropriate for them and becoming part of the apparatus in the modern day governance of the responsible pregnant citizen.

Significantly, the manner in which the data is presented (as 'news bytes') precludes a discussion of the methodological shortcomings of the studies being drawn upon. For instance, the original study published in the *American Journal of Epidemiology* (which was cited in the *Fit Pregnancy* article entitled "Sweat for your baby's sake") outlined a number of limitations of the study, a central one being that "[b]ecause of the cross-sectional study design, we are unable to infer that physical activity reduces triclyceride and total cholesterol concentrations during pregnancy" (Butler et al., 2004, p. 358).[209] *Fit Pregnancy*, however, translated the study into much simpler terms: "exercise can help prevent pregnancy complications" (Kritz, Aug/Sept. 2005, p. 28). It is interesting to note, then, that while the controversy within the medical community during the 1980s regarding the limits of safe prenatal exercise was publicized in popular texts

[209] The study published in *Hypertension* (Sorensen et al., 2003) which was cited in *Fit Pregnancy* (Acosta & Strote, Dec 2003/Jan 2004) was also more nuanced than suggested in the popular journal where it was claimed that exercise in the first 20 weeks of pregnancy reduced the risk of developing pre-eclampsia by 35%. The study used two groups of women, a case group (pregnant women with pre-eclampsia) and a control group (pregnant women without pre-eclampsia who were matched to the case group) and the women in each group had to recall (post-partum) their physical activity during the first 20 weeks of pregnancy. According to the authors of the study, it therefore had a number of limitations including recall bias and difficulty in categorizing levels of activity (i.e., misclassification). And although the researchers attempted to control for confounding factors such as smoking during pregnancy, socio-economic status and pre-pregnancy BMI (to name a few), the uncertainty surrounding the cause of pre-eclampsia means that other variables may have intervened to confound the results.

(with attention to the methodological shortcomings of the available research), I found an absence of similar discussions about the possible methodological limitations of the 'fit for two' data. This could be a reflection of the absence of debate within the medical community or be related to the fact that the positioning of exercise as a way to help a woman be 'fit for two' may boost the sale of magazines and other health and fitness industry goods.

Maternal weight (prior to and during pregnancy) was also a central focus of the 'fit for two' discourses and it was in this context that a clear link was made between the health of the pregnant mother and the future health of her child. The June 2004 issue of *Health* magazine featured an article with the title "Your birthweight, Your Future" which began with the observation that:

> "[a] baby's birth weight is often a source of pride for parents, and rarely forgotten. It may also be a hint of trouble that'll surface years later. Why? Experts say weight is a clue to how the womb may have influenced a child's organs and hormone balances. Here's what to worry about – and how you (or your kids) might change fate. (Steinmehl, June 2004, p. 71)

A table was provided which outlined scientific evidence linking the risk of heart disease, depression, diabetes, breast cancer and "lack of smarts" in adulthood to having a "small" or "large" birthweight (or in the case of GDM, both small and large babies were identified as 'at risk'). 'Prescriptions' for how individuals (born small or large) could try to offset their risk were included in the table. Those at risk for "lack of smarts" (due to a low birth-weight) were advised to "beef up your smarts with brain exercises; try crossword puzzles" while those at risk for diabetes are told to "keep weight in check and have blood sugar tested" (p. 71). In this example, the pressure is on the individual to try to regain control of his or her health and negate the 'damage' done in the womb. While

not stated outright, the known association between maternal weight-gain and birth weight places the onus on the pregnant women to manage their weight gain to ensure a healthy baby that is not too small or too large. What is 'small' or 'large' is, of course, a subjective categorization, a 'norm' to which individuals compare their own pregnancy.

While discussion of proper maternal weight gain (and how it impacts fetal outcomes) was present in several of the general women's magazines and pregnancy manuals, it was most prominent in *Fit Pregnancy* (which is consistent with the focus of the magazine and its aim to promote exercise during pregnancy).[210] The following short excerpts appeared in the "Small Packages" section (i.e., the news section) of the magazine:

> **Obesity Dangers**...women who are obese during pregnancy have more complications and their babies tend to have more medical problems at birth...excess weight increases the risk of hypertension, gestational diabetes and blood clots, and babies of obese mothers are more likely to have neural-tube defects and spend time in a neonatal intensive-care unit. To avoid gaining more weight than necessary, it's crucial to exercise regularly and eat nutritiously (Roan, Oct/Nov 2006, p. 36).
>
> **Watch your weight**...you may want to keep a close eye on the scale during pregnancy. According to researchers...gaining more than the recommended amount...is associated with worse outcomes in newborns, including lower Apgar scores, seizures, infection, the need for breathing assistance and too high birth weight ("Watch Your Weight", Feb/March 2007, p. 27).

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[210] *Shape* ("In Full Bloom", 2003), for instance, featured a 'Success Story' on how an overweight pregnant woman recognized that she was at risk for health complications and decided to take control of her weight (through diet and proper exercise) because "my baby was counting on me" (p. 114). *Baby Talk* (Howard, 2003) published an article entitled "23 ways to lose the baby weight", which provided tips to do just that, explaining that "if you plan to have more children, starting out at a healthy weight may reduce your risk for serious pregnancy concerns such as gestational diabetes and preeclampsia...babies born to heavy women also have a greater risk of prematurity, birth defects, and future problems such as heart disease and diabetes" (p. 56). See also *Prevention* (McGinnis, Feb 2006): "Expecting: Start Exercising" and *Parents* (Oberdorf, August 2007) for other examples of this focus on the dangers of overweight in pregnancy to both mother and baby. Popular pregnancy texts also emphasized the need to strike a fine balance with respect to maternal weight gain, pointing to the medical risks to both mother and child of gaining excessive weight during pregnancy (see *The Mother of All Pregnancy Books*, Ann Douglas, 2000, p. 31-2 and *Understanding Pregnancy and Childbirth*, Sheldon Cherry and Douglas Moss, 2004, p. 104).

> **Weight-gain RX set to change**...Until recently, guidelines for pregnancy weight gain have focused on helping women gain enough to avoid having babies who weigh too little. But that's about to change ...The nationwide obesity epidemic is reflected in higher rates of obesity in pregnancy, which raises risk factors for such complications as gestational diabetes and C-Sections. (Roan, Aug/Sept. 2007, p. 24)

Similar to the advice surrounding the prevention of GDM and pre-eclampsia, the pressure to manage the weight of the reproductive body began pre-pregnancy, as evidenced by articles citing research that women who begin pregnancy overweight are at increased risk of having too large babies (see Dec 2006/Jan 2007 – "Avoiding a too-big baby") or a baby with a birth defect (see Feb/March 2008 - "Obesity linked to birth defects"). In addition to the references which appeared in the "Small Packages" section of the magazine, guidelines for exercise during pregnancy (based on the 2002 ACOG guidelines) were provided in every issue in a section called "Just the Facts," and often included was the reminder that: "if possible, also pay attention to your weight before becoming pregnant. Women who are very overweight when they conceive have an increased risk of having babies with birth defects, according to Centers for Disease Control and Prevention" (from June/July 2004, p. 126).[211] According to the experts, then, the 'ideal' is for woman to be at as 'normal' a weight as possible when she conceives. Those who are not are then identified as having a 'risk factor' for an abnormal pregnancy and 'defective' baby and require additional surveillance. Such weight norms have, of course, been critiqued as arbitrary (Gard & Wright, 2005).

While much of the 'fit for two' information was presented in short news articles or 'fact' sections, the Feb/March 2006 issue of *Fit Pregnancy* also included a feature article on the subject presented with the question "Does size matter?" It most certainly

[211] Also included were guidelines for appropriate maternal weight gain put forth by the Institute of Medicine (IOM).

does, concluded the article, explaining that excess maternal weight gain is a key factor in the obesity epidemic:

> Close to 50 percent of first-time American moms begin pregnancy overweight, and 85 percent of them gain more than is recommended while pregnant. Entering a first pregnancy overweight also makes it more likely that a woman will start subsequent pregnancies even heavier. Experts now believe this cycle of weight gain is a major contributor to female obesity and the nation's obesity epidemic. (Vogel, Feb/March 2006, p. 90)

Under the subtitle 'Overweight: A Peril During Pregnancy,' the various complications arising from this situation were outlined such as diabetes, high blood pressure, difficulty assessing the fetus's growth and well-being, having large babies, and increased incidence of Caesarian sections. The reader was also informed that "the chance of birth defects rises in babies of women with a BMI of 25 and increases with every point above that" (p. 91). Another subtitle stated: "Don't panic – act!" explaining that with proper prenatal care and some lifestyle changes (exercise, proper diet, managing weight gain), an overweight woman can have a healthy pregnancy and baby.

The texts examined thus aim to educate women about the dangers and risks of pregnancy (in this case excess weight gain), with exercise being one technique for controlling this danger and disciplining the reproductive female body. As a researcher cited in *Shape* explained: "Many women don't realize that exercise is as important as not smoking and eating right when you're going to have a baby" (Dreisbach, June 2006, p. 42). Considering that the primary goal of the publishing industry is to make a profit, one must question whether the producers of the texts are genuinely concerned about the health of mother and child, or if they simply use medical discourse to sell magazines, becoming "links in a set of power relations that construct the media discourse on women's bodies" in the process (Markula, 2001, p. 174). The issue is not clear-cut and

the answer likely lays somewhere in between. Regardless of their motives, it is crucial to point out that such texts reinforce the notion of the pregnant body as 'risk' (and women as responsible for managing this risk), feeding into women's concerns and anxieties in an era of intensive motherhood.

What is significant about this advice on how to be fit for two (i.e., using exercise as technique to avoid maternal fetal diseases and prevent birth defects) is that it is actually very difficult to evaluate how certain aspects of maternal lifestyle impact fetal health (see Armstrong, 2003, p. 143; Ruhl, 1999). As Ruhl notes "[d]uring pregnancy, there are simply too many *potential* risk factors; foetal health is affected by a complex interaction of dependent variables so that isolating one or two does not really eliminate the risk of harm to the foetus" (1999, p. 106). Indeed, it is difficult to tell how or if exercise improves fetal outcomes (something that is acknowledged in the scientific literature on the topic) yet in the pages of the popular texts, this idea is presented as 'fact' and the pregnant woman (or the woman considering pregnancy) is urged to use moderate exercise to manage pregnancy risk. In her analysis of pregnancy manuals Ruhl (1999) found a similar onus was placed on pregnant women to manage pregnancy risks. "Risk discourse" notes Ruhl:

> implies that there is always someone to blame, someone who is responsible, if only in a statistical sense, yet what we see in pregnancy is the very difficulty of pinpointing causes and responsibility for birth defects. Risk talk, far from limiting or rationalizing guilt, actually leads to a proliferation of guilt by assuming responsibility everywhere (p. 106).

And the discourses moved beyond just preventing chronic diseases (GDM, pre-eclampsia and obesity) – as the suggestion that women can create smarter babies was also put forth. A short article entitled "Running mom = Smart kid" featured in the "Health and

Fitness" section of *Runner's World*, for instance, described a study conducted by James Clapp which found that "kids born to mothers who exercise vigorously during pregnancy end up slimmer and smarter than those whose mothers do no exercise except walking during pregnancy" (Bean, June 1997, p. 28). It was also noted in *Shape* magazine that "babies born to active moms tend to have higher APGAR scores (a test of alertness, activity and other factors given after birth)" (Dreisbach, 2006, p. 42) while *Parents* featured an article "A Smart Start" which included the subheading: "Intelligence isn't simply a matter of genetics. Following these 10 healthy steps while you're pregnant can help your baby be brainy from birth" (Graham, 2000, p. 241). Two of the tips for building a smarter baby were to "get moving" (i.e., exercise) and to gain the proper amount of weight (20-30 pounds).

Promoting physical activity during pregnancy as a way to have a healthy pregnancy and baby is potentially problematic as the injunction to be 'fit' for motherhood is not just about a mother-to-be increasing her own physical capacities and/or achieving a toned body, but takes on moral or ethical connotations. It is suggested that if a woman wishes to be fit for motherhood, she should exercise and engage in other health-promoting activities for both her own health and that of her unborn child. In this case, the mother-to-be is positioned as responsible for the health of two: hers and that of her baby.

Perceived through a Foucauldian lens of governmentality and biopower, exercise during pregnancy becomes a 'technology of the self,' a practice which allows individuals to better themselves by conducting (either on their own or with the help of others) "a certain number of operations on their own bodies and souls, thoughts, conduct, and way of being" (Foucault, 2003d, p. 146). Foucault (2003e) suggests that practices of self care

that are autonomous and free from the discourses and technologies of "religious, pedagogical, medical or psychiatric institutions" (p. 26) may function as practices of freedom in which an individual engages in his/her own self-formation instead of being the mere "object" of truth games.[212] Alternatively, when the "moral code of conduct is grounded in religious, legal, and scientific norms that dominate the self" (Markula, 2004, p. 306), such practices may quickly turn into disciplinary techniques which subjugate an individual. Indeed, the promotion of prenatal exercise in the texts described above is rooted in seemingly 'objective' scientific knowledge inextricably linking ethical self care with the 'norms' constructed by the medical community, making exercise during pregnancy less of a practice of freedom and more of a disciplining of the reproductive body. Being "fit for two" becomes a moral, personal and social responsibility in advanced liberal society – where the onus is on the woman to help (re)produce a healthy (less costly) population. The pregnant body remains a site of control (and women's health a form of biopower) and this is largely achieved through the continued medicalization of the pregnant body. To be sure, the notion that lack of activity while pregnant may prevent a woman from having a healthy pregnancy - and may even cause her to spread diseases such as overweight and diabetes and/or cause birth defects – is indicative of the manner in which pregnancy is pathologised in contemporary medical discourse as well as in consumer culture where these discourses are disseminated to the general population. In this context, exercise during pregnancy steps into the realm of the new eugenics: those who can afford the time and money to engage in this activity are, supposedly, improving their child's health and intelligence. The discourse of 'risk' is thus mobilized as an

[212] More specifically, Foucault was interested in the way in which the imperative to 'take care of yourself' promoted in ancient Greece was transformed to that of 'know yourself' (a disciplinary form of knowledge) in pre- and early modern Western culture.

ethopolitical strategy, urging women to discipline their bodies in order to have a healthy baby and be a 'fit mom.'

While I wish to emphasize the growing presence of 'fit for two' discourses in popular literature, I also do not want to give the impression that preventing maternal/fetal disease was the only reason being given to engage in physical activity during pregnancy, for it was also positioned as a way to make a woman feel better during pregnancy, train for childbirth and regain her pregnancy figure (the latter two points have also been critiqued – see Dworkin & Wachs, 2004). That said, with few exceptions there was a lack of the feminist orientation that was seen in the mid 1970s-1980s when physical activity was sometimes presented as a way a woman could take control of her pregnant body and gain pleasure from it.

Of the texts that I investigated, I found several articles that acknowledged that women may face obstacles to engaging in regular exercise while pregnant (see *What to Expect When You're Expecting* by Murkoff & Mazel (2008); *The Mother of All Pregnancy Books* by Douglas, 2000; Murkoff, 2006 in *Baby Talk*). The main barriers identified were a lack of time (due to work commitments or other family responsibilities), lack of motivation, and/or the presence of pregnancy-related discomforts which made exercise more challenging. The underlying assumption was that the readership was able to afford the consumer goods necessary to exercise and just needed tips on how to overcome time constraints or a lack of motivation. For example, the Oct/Nov 2007 edition of *Fit Pregnancy* featured an article entitled "No excuses exercise tips" noting that:

> countless studies confirm that prenatal exercise is healthy for you and your growing baby. But there's research and there's reality. How can you go for a power walk

> when you have to stop every ten minutes to pee…or you're so nauseous that you just want to curl up on the couch? (Schlosberg, p. 70)

It was then stated that "in most cases you can work around even the most annoying symptoms. You just need to tweak your exercise schedule and routine, as well as your mind-set" (ibid).[213] Thus, the pregnant woman can (and should) still 'do it all' – she just has to try harder and get more creative.

In the texts that I reviewed, there was no mention of the socio-economic barriers to engaging in exercise and other healthy lifestyle behaviours (lack of money for a gym pass, workout clothes, exercise DVDs) nor any recognition that women may live in neighborhoods where it was unsafe to go for a 'brisk walk' (possibly with several additional children in tow). The texts took what Ruhl calls an "individualized risk model" towards pregnancy (arguably a strand of 'healthism'):

> Social aspects of pregnancy- economic factors that influence prenatal care, social variables such as urban decay or spousal assault that jeopardize the health and welfare of the pregnant woman and the foetus – are overshadowed in the risk model of pregnancy. What this model emphasizes instead is the *individual* responsibility incumbent upon the pregnant woman to provide her foetus with the best possible gestational environment. (emphasis in original, p. 102)

Indeed, a raced and classed image of the 'fit momma' was constructed in the texts that I reviewed. While some racial diversity was evident, white (young, attractive) women were most commonly featured, who also appeared to be heterosexual and middle class (i.e., able to purchase consumer goods and work out regularly). These representations of a 'fit' mother presumably reflects the target audience of individuals who purchase health,

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[213] The authors of *What to Expect When You're Expecting*, for instance, recognized that women may lack the time to exercise and explained that three 10-minute walks throughout the day were just as effective as 30 minutes on a treadmill and that if a reader really could not fit time to workout into her schedule, she could try to work it into her daily routine (i.e., "get off the bus two stops from the office, and walk the rest of the way. Park your car in a faraway spot at the mall…take a brisk walk to the deli instead of ordering in your sandwich. Use the stairs instead of the elevator" (Murkoff & Mazel, 2008, p. 216). If a reader had time but lacked motivation the advice was to find a pregnancy exercise class or to exercise with a friend.

parenting and fitness magazines, which speaks to who has access to health and lifestyle resources. It is important to consider who is depicted as a 'fit' mother and who is absent from this description, because through the pages of popular texts, ideas about what constitutes a 'fit momma' are disseminated, perpetuating and reinforcing stereotypes.

The Danger of Exercising: Responsible Exercise is Moderate Exercise

The message that exercise is beneficial during pregnancy (even a necessity) – was typically tempered with cautions about how much and what kind. Exercise during pregnancy was encouraged - but within limits - and the potential dangers of exercise for the pregnant body and the fetus were discussed or at least alluded to in virtually every article or text that I reviewed (although the severity of the message differed across the texts). The pregnant exerciser must walk (or jog!) a fine line: enough to receive the benefits (or alternatively, manage the risks of excessive weight gain, GDM and pre-eclampsia) but not too hard for fear of harming the baby (although the concern that she will 'hurt herself' was also in evidence). In this section I illustrate how the official position of the ACOG and/or SOGC was typically presented as 'fact.' Even if the actual organizations were not always cited, the advice rarely differed significantly from these official positions. Little attention was paid to alternative forms of knowledge although – and as I try to draw out in this section – the advice provided did seem to vary slightly according to the genre of the text. Sport and fitness-focused magazines (especially *Runner's World*) appeared less 'risk-centred' while parenting magazines provided the most cautionary advice, likely a reflection of their target audience.

A common formula emerged in the articles about physical activity during pregnancy whereby several benefits were listed, followed by caveats regarding exactly

what and how much is safe. Several articles, in particular, focused on the risk of falling, pointing to the potential of a miscarriage. While I do not wish to discredit this concern as irrelevant, I do wish to illustrate how this risk is perhaps exaggerated in some of the texts, especially the parenting magazines that I reviewed. Consider, for instance, a November 2006 article in *Parents* which aimed to dispel the pregnancy myth that women should not do any sports for fear she would "jostle the baby." The reader was informed that:

> Exercise is good for both of you. The ACOG recommends that pregnant women who don't have any medical issues get at least 30 minutes of moderate exercise most, if not all, days of the week. But it's best to choose low-impact workouts like walking, swimming, or yoga. Running, bike riding, tennis and other sports that rely on balance are not ideal because your center of gravity is changing and you can fall more easily. (Felsenthal, 2006, p. 201)

Despite its expressed purpose to dispel myths, the article reinforced the idea that pregnant women are clumsy and therefore unable to run or ride a bike. A similar message was expressed in a later article in the same magazine (see Oberdorf, August 2007, p. 159). After informing the reader that regular exercise during pregnancy can improve heart health, increase energy and 'pump up' self image, the reader was provided with the advice that while walking is a good exercise, she may lose her sense of co-ordination as her belly grows and should therefore "try to walk on smooth surfaces and watch out for potholes and other obstacles" (p. 159). Instead, swimming was positioned as the ideal form of exercise during pregnancy for "there's zero chance of falling on your stomach and injuring your baby." A concern with falling was also presented in the Question and Answer section of *Fit Pregnancy*, however, as Dr. Agnew explained the potential risks of a pilates workout while pregnant:

> This exercise often is done on an apparatus with spring resistant bars, but getting on and off during the second and third trimester can be awkward and pose a risk of

> falling. Because of this, I recommend that Pilates workouts be done exclusively on floor mats once the second trimester begins. (Agnew, Jun/Jul 2004, p. 46)

In addition to the suggestion that pregnant body is too clumsy to negotiate climbing on and off exercise apparatus, she explained that "You also should not work out on your back in your second and third trimesters," reinforcing one of the ACOG exercise guidelines that has been a subject of contention for the past two decades (Gauthier, 1986).

The assertion that a fall will cause a miscarriage in a healthy pregnancy is a debatable one – especially if the fall occurs while walking or climbing on and off a pilates machines (i.e., low velocity activities). Concern about a miscarriage due to abdominal trauma is probably one of the most commonly-held or 'popular' (and deeply rooted) fears about the danger of activity when pregnant. It is also a fear that has gained an exaggerated credibility over the years – most likely the legacy of nineteenth century medical advice advising women not to ride in motor cars or use a footpedal sewing machine. Indeed, and as I discuss in the following chapter, several of the physicians that I interviewed indicated that in their experience, a healthy pregnant woman can sustain a fall (while skiing or even horseback riding) without necessarily harming the fetus. While playing contact sport past three months may not be safe, to position walking as dangerous is questionable. These articles, written by those considered to be experts (i.e., physicians, physiotherapists, fitness trainers) have the potential to shape a woman's understandings of her body, causing her to (unnecessarily) limit her physical activity endeavors, also lessening her enjoyment of the activities she does engage in for fear she will harm her baby.

In addition to cautions around loss of balance and falling, several articles pointed to the negative consequences of exercising at levels perceived to be too hard. *Shape*

published a short article entitled "Expectant moms are fit to exercise" (in its "Live Healthy" news section) citing Canadian research findings that "regardless of how far along women are in their pregnancies, they can engage in moderately intense activity such as riding a stationary bike for 20 minutes on a low level" (September 2007, p. 135). This encouragement was followed by the warning that "despite the benefits of exercising, you still want to avoid overexerting yourself (a heart rate of anything more than 140 beats per minute) or overheating, which may harm the developing fetus" (p. 135). As discussed in the previous chapter, 140 beats per minute as an upper heart rate limit has been critiqued as overly conservative. Moreover, 'overheating' is a vague term that is very subjective and could likely cause a woman to limit her exercise endeavors as she worries about breaking a sweat.

In an article entitled "Fit for Delivery" in *Baby Talk* (Tupler& Wood, June/July 2001), the reader was encouraged to engage in exercise in order to prepare for the marathon of birth (based on a study suggesting that women who engaged in heavy exercise had faster deliveries than those who engaged in moderate exercise). But after this initial encouragement, the reader was quickly cautioned:

> Still, you shouldn't just step outside and start jogging. Exercise during pregnancy must be carefully monitored for your own safety and the health of your baby...and while overall fitness is always a plus, there are very specific muscle groups that are instrumental in childbirth, and these are the ones on which you'll need to focus. (p.33)

The need for strong abdominal muscles, particularly the transverse abdominis, was identified as the key muscle group in need of training. Thus, the article suggests that the woman is exercising not so much for own mental health and enjoyment but rather to train the appropriate muscles for birth – aerobic exercises (such as jogging) which are viewed

as 'riskier' were not mentioned. The same magazine featured an article which posed the question "Can you prevent miscarriage?", making the contradictory statement that "although the cause of miscarriage is usually out of a woman's control, you can increase your odds of having a successful pregnancy by taking charge of your health" (Siklos, April 2004, p. 82). According to the article, one way to 'take charge of your health' is to exercise in moderation as:

> doctors speculate that excessive physical activity (such as heavy running) may cause miscarriage because it elevates body temperature and can reduce flow to the fetus. To play it safe, exercise in moderation and avoid activities (such as skiing or horseback riding) that could cause you to lose your balance or lead to an abdominal-area injury. (p. 82)

In this example, something which is supposedly out of a woman's control (miscarriage) is placed back in the realm of her responsibility based on speculation that physically active pregnant women have been challenging for the past two decades through their own actions. Following Ruhl (1999), we see a "proliferation of guilt by assuming responsibility everywhere" (p. 106) with the pregnant woman being entreated to limit her activities to ensure the health and safety of her baby.

Cautions regarding the dangers of exercise during pregnancy were not limited to magazines, but were also evident in the pregnancy advice manuals. In *Understanding Your Pregnancy and Childbirth* (2004), for instance, Drs' Cherry and Moss reverted back to several of the old (and contentious) 1985 ACOG guidelines, illustrating the persistence of such discourses. More specifically, they suggest that heart rate be kept below 140 bpm, that 102 degrees F (38.5 celcius) was the critical core temperature at which risk of birth defects increases (with no mention that this is based only on animal studies, with no proof in human subjects), and that women should avoid ballistic movements and deep flexion.

After giving an overview of the ACOG guidelines (supposedly the latest version) they note that "in addition to the ACOG guidelines, we want to enlarge on some special points that in our experience have proven important" (p. 120). These included such suggestions as: "consider decreasing weight bearing activities like aerobic dancing, rope jumping, jogging and running" and instead engage in non-weight bearing activities as these workouts "cut down on bouncing, are a bit less strenuous, and may be better tolerated by the fetus" (p.120) and "exercise for shorter intervals. Start with a ten- to fifteen-minute interval; then rest for five minutes and resume exercise for another ten to fifteen minutes" (p. 121).[214]

The majority of actual pregnancy workouts were found in *Fit Pregnancy* - not surprising considering the focus of the magazine. While not as conservative as some of the advice discussed above (which was typically presented in parenting magazines and pregnancy manuals), 'moderation' was a dominant theme. Popular workouts were toning exercises (using the weight of the body or light hand weights), pilates and yoga - although jogging was recognized as an acceptable activity for women who jogged pre-pregnancy (see, for instance, Hanson, June/July 2004, p. 94-97). Several of the workouts were posed as a way to be strong and yet also to build feminine/maternal traits. For instance, the Feb/March 2004 issue featured a yoga workout to build "strength & serenity" and to help "harness your body's power for labor" (Dunn, 2004, p. 89), the Feb/March 2005 issue featured a pilates workout that would help the participant be

[214] In the Canadian text *The Mother of All Pregnancy Books* the reader was advised to "choose your fitness activity with care. Certain forms of exercise are not recommended for pregnant women. Avoid anything that could leave you susceptible to injury – deep knee bends, full sit-ups, double-leg raises, straight-leg raises and so on" (Douglas, 2000, p. 192). It was also suggested that pregnant women "avoid activities that could result in abdominal trauma or other types of injuries", including the "high impact, weight bearing sports such as running or jogging" (p. 193). This advice echoes 1985 ACOG guidelines which were heavily critiqued as overly conservative, illustrating the staying power of such discourses which limit the activities that pregnant women may engage in.

"strong and serene," relax and get into shape for labour (Hanson, 2005, p. 79) and to be "strong and sexy" was the purpose of the exercises outlined in the June/July 2005 issue.[215] 'Serenity' and 'sexiness' are traits commonly associated with femininity and in this context 'strength' was linked to 'female' roles such as childbirth and motherly duties (i.e., picking up a baby, carrying a baby along with a diaper bag and groceries, etc).

The articles in *Fit Pregnancy* typically followed the current ACOG advice (even if they were not stated explicitly) and five key points from these guidelines were also included in the 'Just the Facts' section. The first point encouraged women without contra-indications to engage in 30 or more minutes of moderate activity most days of the week (after receiving physician clearance) while the remaining four were cautions to avoid standing motionless for long periods of time and exercising on your back; participating in activities with high risk of falling or abdominal trauma (e.g., basketball, soccer, in-line skating, horseback riding, downhill skiing to name a few); scuba diving; and exertion at altitudes higher than 6,000 feet.[216] The guidelines were presented as 'fact' with no discussion of the continued debates in the medical community regarding the safe upper limits of physical activity during pregnancy.

Interestingly, while the need for caution/moderation when exercising while pregnant was expressed in *Fit Pregnancy*, the cautions were not posed through the use of scary language or consequences (i.e., the reader was not told, for instance, that

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[215] The latter workout featured three leg exercise (ballet-type moves) and an overhead triceps extension using light handweights. The reader was advised that: "these simple moves will not only help you to carry your baby and all the gear you need once he arrives...they will also make you want to show off your beautiful body" (p. 68).

[216] The "Just the Facts" section also included a list of indications or symptoms that a woman should cease her exercise (featured in a box with a heading such as "STOP!" or "CAUTION"). Symptoms that a woman should "STOP!" included: calf pain or swelling, chest pain, decreased fetal movement, difficult or laboured breathing prior to exertion, dizziness or headache, leakage of amniotic fluid, muscle weakness, preterm labor, vaginal bleeding (see for instance, "Just the Facts," Aug/Sept 2006, p. 124).

overheating would cause birth defects or that overexertion would shunt blood away from fetus as was seen elsewhere). This is not to say that pregnancy was not pathologized, however. Instead of emphasizing the dangers of exercise during pregnancy, the magazine constructed the pregnant body as out of control, with the suggestion that exercise could help to improve posture and prevent falls, alleviate pregnancy-related discomforts and help the reader train for the marathon of birth. The different emphasis illustrates that while 'risk' was a common theme across the examined texts, it was delivered in a slightly different manner within different magazines as their aims or styles dictated.

In my analysis, I found some suggestion that it is acceptable for women to do more than 'moderate' exercise. Two narrative accounts of women's experiences running while pregnant challenged the idea that pregnancy is incongruous with a more strenuous workout. In an article featured in *Runner's World* entitled "Mother Knows Best: Running Through Pregnancy got her Dirty Looks, Rude Comments – and a Healthy Baby," Bridson-Boyczuk described how her exertions during pregnancy made her feel great (and allowed her to have a healthy baby) but were challenged by concerned on-lookers (2004, p. 56). And in the "Real Life" section of *Shape*, Shaun Dreisbach discussed how her workout of a four mile run and crunches elicited comments from fellow gym patrons – although her workout routine had no ill effects on her or her baby (Dreisbach, 2006, p. 42).

It is significant that the texts which challenged the notion that 'moderation is best' were presented as personal narratives (based on women's own experiences), and were not actual advice to readers on 'how much is safe.' which likely reflects the fact that producers of magazines/manuals fear they may be held legally liable for the advice

provided. That said, there were examples (albeit limited) where the standard (ACOG) advice was over-ruled by medical experts. In the Question and Answer section of *Fit Pregnancy*, for example, Dr. Agnew (Aug/Sept 2004) acknowledged that women used to exercising at altitude can likely keep hiking at over 6000 feet (although she urged the reader to check with her own doctor and recommended modifying intensity in the second and third trimesters) and in a later column she also concluded that a pregnant woman who is an experienced exerciser could lay on her back for short periods of time (as long as she stopped if she experienced dizziness, shortness of breath or pain) (Dec2004/Jan 2005). Similarly, in the pregnancy manual *What to Expect When You're Expecting* (2007), it was explained that women experienced in outdoor sports such as horseback riding, hiking, skating could continue these activities (but to stop when their balance is off) and even kickboxing was approved but "just be sure to avoid any movements that you have difficulty with or cause you to strain… [and] make sure you keep a safe distance from other kickboxers" (Murkoff, et al., p. 226-7).

Such examples were the exception, however, as there was little recognition that the standard exercise advice of 'moderation is best' is not appropriate for all women. The ACOG guidelines (and sometimes SOGC) were often presented as 'just the facts.' Absent were in-depth discussions of the methodological limitations of the existing research on exercise during pregnancy – a situation which stands in contrast to that of the 1980s and early 1990s where debates regarding 'how much' were quite prominent in popular texts.[217] In the women's magazines, especially, it appears that the debates

[217] Perhaps that most explicit acknowledgement of the uncertainty surrounding safe limits appeared in a *New York Times* article by Gina Kolata entitled "Pregnant Exercisers Test Limits" (November 8, 2007). The article describes research (led by James Pivarnik) which examined training patterns during pregnancy and postpartum and found that amount of training (even rigorous training) was not related to adverse

regarding the safe limits of exercise during pregnancy have largely faded, and the 'official' ACOG guidelines are accepted as 'common sense.'

This is not to say that moderate exercise is 'bad' and intense exercise is 'good.' My aim is to illustrate the type of knowledge regarding exercise and pregnancy that is privileged and how it is embedded in the contemporary context. That the pregnant body continues to be constructed as 'at risk' (such that responsible exercise is moderate exercise) illustrates the persistence of knowledge put forth by the medical institution two centuries ago to discipline the female reproductive body and ensure the fitness of the population. It may also be that the publishers of the various texts are concerned not so much with the 'risk' of exercise to the pregnant body but rather with the 'risk' of litigation if they provide advice that is perceived to be unreliable or irresponsible. Thus, issues around legal liability may inform the decision to use the ACOG (or SCOG) advice as the standard of care, and to promote moderation, more generally.

While it was not uncommon to see the advice to 'listen to your body,' it was typically framed as listening to your body to tell you when to 'stop' due to pain/discomfort (rather than listening to your body to tell you if it's safe to push harder and/or keep exercising) and was often presented as the last item in a long list of pregnancy cautions. Perhaps the most pronounced example was an excerpt found in the text *Understanding Pregnancy and Childbirth* (Cherry & Moss, 2004). After presenting an extensive list of exercise cautions and stressing the importance of patient and physician communication in creating an appropriate exercise programme ("the

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events. The methodological difficulties of research were acknowledged (i.e., that it is often based on small studies and case reports with a lack of randomly controlled trials). Dr. Shangold was interviewed for the article and cited as saying that "the advice often varies by doctor and can be based more on hunches than science...The problem is that we don't know yet what the safe limit...We are probably more conservative than we need to be" (p. G8).

importance of this communication between you and your physician cannot be overemphasized") it is noted that:

> you have to take responsibility for being alert to the potential hazards of exercise. When you're out on the track or the tennis court, be aware of the warning signs, and report back to your physician if anything unusual occurs. (p. 117)

Given the numerous messages regarding the riskiness of the pregnant body circulating in contemporary society, it is questionable as to whether the embodied messages of the pregnant exerciser can stand alone (or if they are filtered through the various risk messages circulating in her environment). In the end, whether 'mother knows best' is questionable.

The 'Yummy Mummy': The Risk of 'Baby Fat'

Another risk-centered theme which emerged was the problematization of 'baby fat' - not in the context of fat as a health issue but rather on the level of aesthetics. Motherhood (especially the nurturing mother) was constructed as desirable, feminine and even sexy (one of a woman's most important life experiences), yet at the same time the changes in body shape that come with pregnancy were presented as problematic. While the texts I reviewed did not explicitly state that a woman should worry about how weight gain impacts her figure during pregnancy, the repeated problematization of postpartum baby fat combined with images of young, attractive and toned pregnant women (yummy mummys) position the reader to indeed worry about how her pregnancy weight gain impacts her figure, making 'baby fat' a potential source of anxiety *during* pregnancy (and not something that merely becomes an issue post-partum).

Within the majority of the popular magazines that I reviewed, articles on how to lose the 'baby fat,' 'baby belly,' or 'mummy tummy' were commonplace (one exception

being *Runner's World*). The postpartum body was the object of these discourses on how to regain the pre-pregnancy figure, with exercise often presented as a key strategy in this quest. This message appeared in a range of genres, including health magazines (such as *Prevention* and *Health*), parenting magazines (*Parents*), as well as women's fitness magazines - the latter of which have been well-documented as sources of feminine bodily norms (see Duncan, 1994; Markula, 1995). "Bye-Bye Baby Belly" was the title of an article in *Prevention* (Johnson, July 2005, p. 133-4) that featured the work of Julie Tupler, "an RN childbirth educator and certified fitness trainer," her expertise ostensibly legitimizing her weight loss advice and in turn the notion that postpartum women *should* be losing their baby fat. The article outlined some key exercises taken from her new book "Lose Your Mummy Tummy" (which aimed to help new moms target the cause of their "pooching tummy") and was accompanied by a picture of young attractive Caucasian women in a bikini – with a flat, toned midriff – kissing a smiling laughing baby, suggesting what the new mother could (and should?) look like and moreover, that motherhood is fun and sexy. Similarly, *Health* (Reid-St. John, June 2004) and *Parents* (Bowen-Shea, April 2004) both featured articles (taken from books written by fitness experts)[218] on how to 'walk off your baby weight' alongside images of smiling, attractive women walking with their babies. Articles on how to 'get your body back' or 'lose the baby fat' were standard fare in each issue of *Fit Pregnancy* magazine. The article was often advertised on the front cover with catchy headings such as "**Blast** post-baby **AB FLAB**" (Feb/March 2005), "10-minute workouts to get your body back **fast**"

[218] *Health* advertised "Walking through pregnancy and beyond" by Mark and Lisa Fenton while *Parents* featured "Walk the Weight Away!" by personal trainer RoseMarie Alfieri.

(Feb/March 2004), "Get your body back" (June/July 2005); "Post-baby **BODY BUMMERS** – and how to fix them" (Feb/March 2007).

Another feature in the women's magazines was 'success stories' featuring 'real' moms who had taken control of their post-pregnancy lives (and bodies) and lost the baby weight. These articles featured titles such as "Bye-Bye Baby Fat!" (Bollinger, Dec 2004 in *Prevention*), "I Lost the Baby Weight" (Straley, Oct 2001 in *Parents*) and "How I got my Body Back" (Robbins, Oct 2006 in *Shape*) and the overall message was that if you try hard enough and take control of your body through proper nutrition and exercise, you too can lose your baby weight, regain your femininity, and be a better mother. The women sharing their stories appeared to be middle class and in a heterosexual marriage (i.e., the readership of the magazines). As such, they had the money to purchase gym passes and equipment as well as supportive husbands who would care for the baby while their wives went to the gym – and the texts assumed the reader had the same resources. However, in their favor, these features depicted 'real' moms who had bodies that did not necessarily conform to the toned/slim ideal (although one gets the impression that this is what they were striving for).

The construction of the post-partum body as problematic and the pressure to lose the baby fat and regain a toned, fit body is not surprising considering the pressure women face to discipline their bodies, more generally. A toned body symbolizes a beautiful body, a healthy body and good (moral) citizen. Indeed, within the texts, 'getting your body back' indicated that a woman was taking control of her life, her body and perhaps most importantly, her new role as a mother. Exercising away the baby fat becomes a 'technique of the self' used to transform a woman into a good citizen and mother who has

the stamina to keep up with her children and who will also be a good role model for her children with regards to proper diet, exercise and other lifestyle choices. New mothers are personally responsible for these changes and just require the will power to make them happen.

While the post-partum body was marked with the need to lose weight, it was not stated that a *pregnant* woman should worry about her body image and/or limit weight gain - for aesthetic reasons, at least. In fact, the predominant message was that the expectant mother should put the needs of her baby before her own, which meant gaining the proper amount of weight (enough to create a healthy baby but not too much lest she breed obesity and other health problems). At the level of aesthetics, 'baby fat' is something to worry about *after* the baby is born. However, this message was undermined by the persistent problematization of baby fat and constant reminder of the difficulty of losing baby fat post-pregnancy which positions the reader to fear (even dread) the weight gain associated with pregnancy and possibly contributing to body image issues during pregnancy. Discourses which construct the female body fat as problematic are, of course, symptomatic of a society which privileges the feminine bodily norms of a toned and slender body (Bordo, 1993), but historically the pregnant woman has been viewed as exempt from such pressures. Indeed, it has been suggested that pregnancy is the one time that women are permitted to take up more space, overflow their boundaries and take leave of body image pressures (see Bailey, 2001; Warren & Brewis, 2004). The repeated emphasis on losing baby fat post-partum and the ever-growing tyranny of slimness that women face more generally have the potential to negatively impact women's body image *during* pregnancy. Indeed, in her investigation of women's experiences of weight gain

during pregnancy, Earle (2003) found that some women were concerned with issues of fatness and appearance during pregnancy. While worried about looking 'fat' (when they put weight on arms, face, thighs), they were enthusiastic about the baby bump and many welcomed increases in breast size, illustrating how feminine body norms continue to impact women's perceptions of their pregnant bodies (i.e., voluptuous breast and the baby bump were looked upon favourably as signifying female sexuality/femininity, but 'baby fat' deposited on the arms, face and thighs was viewed negatively).

Images of the pregnant yummy mummy likely contribute to anxieties regarding body image and fear of baby fat during pregnancy. The yummy mummy, as mentioned above, is a young, beautiful pregnant woman who has a toned (albeit pregnant) body with little evidence of weight gain aside from her baby belly and voluptuous breasts (i.e., the pregnant body that some of Earle's respondents seemed to favour). In the material reviewed, she was appeared to be married (posed to show off a wedding ring), in a heterosexual relationship and middle class (as evidenced by her stylish clothes, ability to purchase exercise gear and leisure time to work out). Although evident in magazines such as *Shape* and *Parents*, the image of the pregnant yummy mummy was especially predominant in *Fit Pregnancy*. The cover of the magazine always featured a pregnant 'yummy mummy,' always attractive and sometimes a celebrity – the quintessential yummy mummy. Inside the magazine, the celebrity was featured in the 'Star Mom' section, which included an interview in which the celebrity was asked such questions as how she feels/felt during pregnancy, if she has/had any crazy cravings, what type of mother she things she'll be/is, her exercise routine during pregnancy and about her

delivery plans (or delivery if she already had the baby).[219] The interviews painted pregnancy and childbirth in a positive light, motherhood was constructed as wonderful and the well-being of the baby always put first by the star moms.[220]

The yummy mummy was also evident in the numerous ads for maternity clothes, several of which presented women with model-thin arms and legs and only a pregnancy bump. For example, the "A Pea in the Pod" ad in the Feb/March 2006 edition (p. 65) featured a young women wearing a green dress, posed with arms on her waist so that her thin arms are pronounced, winging out to the sides, and the April/May 2008 issue included an ad for '2chix Clothing' which presents an attractive young blonde woman (also very thin with the exception of her baby bump) clad in underwear and a t-shirt which asks "Does this BABY make my BUTT look big?" (p. 149). In each issue there was also a fashion spread of a pregnant model, often scantily clad, with thin arms and legs and only a baby bump.

I should note, however, that the promotion of the 'yummy mummy' and the problematization of baby fat were not evident in all of the literature included in the sample. For instance, the *Runner's World* articles, as well as the pregnancy books did not appear to play on this aspect. *What to Expect* (2007) did provide tips for how women could feel more attractive during pregnancy, but glamorous pregnant models were not featured and baby fat not dwelled upon. And the text *Understanding Pregnancy and*

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[219] See for instance, "Yummy Mummy Jessica Alba" (Cooney-Carrillo, June/July 2008, p. 74-76); "Model of Fitness" Gabrielle Reece (Wycoff, Feb/March 2004, p. 36); "Olympic Mom" Marion Jones (Wycoff, June/July 2004, p. 68); "Due Process Michael Michele" (Wycoff, Feb/March 2005, p. 60); "Rockin' Mama Brooke Burke" (Feb/March 2007, p. 58).

[220] The interview with Marion Jones acknowledged the difficulty that she had with losing control of her body during pregnancy, although in the end she framed it in a positive light: "As an athlete who's used to being in peak form, it was challenging for me to watch my body totally change since I had no control over that. I loved having my baby inside of me, but I was very happy when he was finally here" (Wycoff, June/July 2004, p. 68).

Childbirth (2004) appeared to be anti-yummy mummy: women were encouraged to take care of their appearance but it was in the context of the pregnant women in the workplace, with the underlying message being that they do not really belong there (i.e., fashion tips were offered for how to blend in and avoid making a show/drawing attention to the pregnant body). Even in *Fit Pregnancy*, where the 'fear of fat' theme was most prominent, there were examples of more positive messages for the reader. The pregnancy workouts (demonstrated by pregnant models) sometimes depicted women who were a bit heavier in stature (and had weight gain distributed to their legs and arms) and the focus of the accompanying text was typically on how exercise would help the reader prepare for labour and motherhood. It was sometimes mentioned that exercise would help to tone the arms and legs (for example: "No matter how big your belly gets, nicely toned arms and legs will help you feel beautiful the entire nine months" in "Strong & Sexy," June/July 2005, p. 68), but the overt message was to exercise for a healthy pregnancy, not to promote weight loss in pregnancy.

Overall, though, pregnant women are increasingly being positioned to worry about their appearance and the addition of unwanted baby fat – and exercise plays a central role in this for it is a technique to keep (or try to keep) the body firm and toned while pregnant, as well as to 'fix it up' after the baby is born. It appears that being pregnant does not allow women to escape the emphasis on body norms characteristic of the fitness industry (Bordo, 1993b; Duncan, 1994; Eskes et al., 1998; Hesse-Biber, 1996; Markula, 1995). Images of the yummy mummy (both pregnant and post-partum), combined with articles on how to 'blast the ab flab' and success stories of how women took control of their bodies serve a panoptic function, presenting the reader with images

of what the pregnant (and postpartum) body could/should look like if a woman has the discipline to work out and monitor her diet. These messages then interact with others circulating in popular culture, such as a TV news show reporting which celebrity dropped her baby weight the fastest and the recent announcement that Ashlee Simpson (sister of Jessica Simpson) has "embarked on a strict exercise regime to avoid gaining too much weight while pregnant" (http://sympatico.msn.ca/?lang=en-CA, July 14, 2008).[221] An unrealistic norm is created to which women are compelled to conform as they encounter these discourses, and then survey their own bodies to see if they measure up. This finding supports my previous analysis of the 'Fit for Two' column in *Oxygen* magazine, which privileged the toned, fit pregnant body, a message that was reinforced as the column was surrounded by additional 'yummy mummy' discourses in the magazine (e.g., ads for products to help reduce unsightly pregnancy stretch marks, photo spreads of 'Hollywood Hotties' and articles on how to 'battle the baby bulge' postpartum) (Jette, 2006). Dworkin and Wachs (2004) found a similar emphasis on feminine bodily norms and fear of baby fat in their analysis of *Shape Fit Pregnancy* (from 1997-2003). In fact, they suggest that it is the very tension between the bodily experiences of the pregnant woman (i.e., a body resistant to containment) and the demands of feminine bodily norms (i.e., the toned, slender body) which "allows for corporations to capitalize on intensified feelings of anxiety about the body to sell the benefits of fitness to pregnant women" (p. 612).

While a critique of the yummy mummy as another pressure to conform to feminine bodily norms is a valid one, one must also question if the 'yummy mummy' is potentially empowering for women. That is to say, it may be viewed as a form of

[221] Disturbed by the fact that she had already gained 20lbs, she hired her sister's former personal trainer to help her manage her weight gain.

resistance to the asexualization of the pregnant body and the long held notion that the pregnant body is no longer ornamental (sexual and desirous) but merely functional (asexual and even leaky/unattractive) (see Earle, 2003; Longhurst, 2000). The 'yummy mummy' celebrates pregnancy and motherhood, constructing it as glamorous and sexy – an entire lifestyle - and in this view the pregnant body is something to be proud of and put on display. Of course, this glamourization of pregnancy and motherhood has also been critiqued as a subtle form of promotion, encouraging women to fulfill their reproductive destiny – the new feminine mystique (see Douglas & Michaels, 2004; Kuperberg & Stone, 2008). It also privileges a certain social class of woman as the 'ideal' mother. This tension between empowerment and agency illustrates the complexity of the power relations surrounding the female (reproductive) body.

The 'fear of baby fat' discourse also adds a level of complexity to the messages surrounding weight gain during pregnancy, more generally. As discussed previously, women are under growing pressure to gain the proper amount of weight while pregnant and according to popular literature, it is a fine balance as too little or too much can both increase the risk of pregnancy complications and the future ill health of the child. In this context, body image issues (fear of baby fat) add to the pressure that women face when managing weight gain (risk) during pregnancy. Interestingly, several articles did address the issue of weight gain and body images (see Stacey, May 2002 in *Shape*; Stokes, April/May 2005, p. 78; Korn, April/May 2002; Barrett, June/July 2005 in *Fit Pregnancy*). However, they did not acknowledge their own role in playing on women's body image fears but rather constructed it as an individual problem that the woman could fix through work on way of thinking/identity. The *Shape* article entitled "Fear of Pregnancy" (Stacey,

2002) for instance, suggested that women merely need to reframe their way of thinking to realize that pregnancy/birth is one life's richest experiences which should not be sacrificed to the quest for slenderness - ironic considering that the story was featured in a magazine filled with pictures of women with fit, toned bodies. And while a *Fit Pregnancy* article called "Mirror, mirror" (Barrett, 2005) acknowledged that chemical/hormonal changes during pregnancy can impact body image and critiqued the media's celebration of Sara Jessica Parker who gained minimal weight during pregnancy, the author did not acknowledge the magazine's own role in disseminating problematic messages. Instead, the article suggested that women take individual action to solve their body image issues by educating themselves about proper weight gain, finding a community (i.e., a support network), getting therapy, and realigning their priorities (evaluating self worth by measures other than thinness). True to the nature of disciplinary power, a social problem (media portrayals of unrealistic body image) is constructed as an individual one. The onus was placed on the woman to examine what's really important: "your baby's health or your desire to be thin" (p. 46).

The above quotation captures the dilemma pregnant women (increasingly) face in contemporary consumer society: put your baby first yet obsess about your own appearance. By creating norms for which contemporary mothers-to-be (and new mothers) should strive, both the 'responsible mother' and the 'yummy mummy' discourses play on the vulnerabilities of pregnant women, promoting not only self surveillance of the body, but also the purchase of the magazine (and other consumer products featured in the magazine) to help them attain these goals. Exercise practices become a point of tension in this equation as physical activity is increasingly recognized as a way to promote a healthy

pregnancy and baby (be fit for two) but also as method for helping to lose weight and firm the body (be a yummy mummy). The motives underlying each of these practices are at odds - one focuses on the baby and the other focuses on the self – and the pregnant woman is under pressure to strike a fine balance to try to achieve both. In no way are these practices what Foucault termed 'practices of freedom' as the pressure to exercise is tied to medical discourses and knowledge as well as feminine bodily norms disseminated by the fitness industry (and within consumer culture more generally).

Conclusion: The Vortex of...Risk

A central finding in this chapter is that 'objective' scientific knowledge (particularly that endorsed by central medical organizations) appears to be the dominant 'way of knowing' about the pregnant body and exercise. Thus, while the medical establishment continues to play a role in the production of disciplining knowledge for the pregnant body, consumer culture is often a central site for the dissemination of this knowledge (and the promotion of self-health practices for the pregnant woman, in general). Within the popular literature that I reviewed, medical discourse around being 'fit for two' (the disciplining of the reproductive body) co-mingled with discourses promoting feminine bodily norms (the disciplining of the feminine body), both requiring self-surveillance and regulation in order that a woman may be 'fit' for motherhood. Consumer products such as pregnancy fitness magazines, pregnancy advice manuals and exercise DVDs endorsed by health experts were presented as items which allow the consumer to shape her body (and identity) into that of a 'fit' mother. The pregnant woman is thus positioned as a consumer who may enter the marketplace to seek out and pay for expert advice in order to self manage risk and/or achieve a toned and fit body, and

the success of the pregnancy and fitness industry suggests that pregnant women are willing to do just this. In this view, the actual texts – which draw upon official guidelines and newly emerging scientific studies - become a technology of governance, part of the apparatus in the disciplining of the pregnant body.

This analysis illustrates how 'risk' is taken up profitably in consumer culture: the pregnant woman is variously constructed as 'at risk' of not exercising enough, exercising too vigorously and of gaining baby fat, with popular texts providing advice to help her manage this risk and be 'fit' for motherhood. The risk-related advice surrounding prenatal exercise presented in the popular literature fits well with the promotional logic of neo-liberal society, more generally. Knowledge from the scientific realm and images of the 'yummy mummy' play off each other to promote exercise during pregnancy as a self-governed lifestyle choice, subtly instilling individuals with the motivation and knowledge to model their conduct in normalized, moral and self-validating ways. By constructing the pregnant body as at risk, being 'fit for two' becomes a strategy for ensuring the health of both mother and child, illustrating the manner in which women's health remains a form of biopower and women's fitness part of the apparatus of modern day governmentality.

Significantly, the 'risk' discourse around prenatal exercise presented here join a sea of other messages about pregnancy-related risks circulating in the popular literature - the risks of alcohol consumption, smoking, too much stress, improper food choices, inadequate nutrition and exposure to environmental toxins (to name a few). As such, they are links in an endless chain of promotion in which the pregnant woman is entreated to take personal responsibility for managing pregnancy-related risks by engaging in healthy behaviours with little recognition of the socio-cultural constraints on their ability to make

rational decisions and engage in appropriate lifestyle behaviours (see Jette, 2006; Marshall & Woolett, 2000; Ruhl, 1999). Wernick (1991) has termed this endless chain of promotion that is characteristic of our mass-mediated society the 'vortex of publicity,' noting that:

> Promotion in different spheres, then, multiply interconnects – both in terms of the common pool of myths, symbols, tropes, and values which it employs, and through the way in which each of the objects to which a promotional message is attached is itself a promotional sign, and so on in an endless chain of mutual reference and implication. (p. 187)

In the context of pregnancy-risk, what is being promoted is not only consumer goods to help a woman manage the risk, but an entire lifestyle or way of being a 'fit' mother. While this chapter examined some of the 'promotional messages' about exercise during pregnancy circulating in popular literature, in what follows I turn to physicians' understandings of prenatal exercise and the advice that they provide to their patients.

CHAPTER EIGHT

'Doctor Talk': Physician Perspectives of Physical Activity and Pregnancy

While popular literature is an important source of health knowledge in our mass mediated society (see Seale, 2004), physicians continue to play a central role in prenatal care. As Weir (1996) points out, the pregnant body remains the site of clinical examination, subject to the medical gaze and assessed for risk using a variety of technologies such as antenatal risk assessment forms, prenatal screening procedures and diagnostic tests. Indeed, almost every magazine article or book on prenatal exercise that I reviewed warned the reader to 'check with your doctor before starting or continuing an exercise programme.' Given that the physician is constructed as the 'expert' on prenatal exercise, this chapter provides insight into 'doctor talk' about exercise during pregnancy – that is, the way some doctors talk about and construct the topic in their daily practices, interactions with their professional colleagues and their encounters with patients (Armstrong, 2003). As Armstrong (2003) explains, "[m]edical knowledge is manifest not only in medical journals and textbooks but in the collective and individual consciousness, minds, experiences and practices of doctors" (p. 106). Exploring 'doctor talk' on an issue thus provides insight into the set of everyday assumptions and actions that construct the social reality of an issue (such as prenatal exercise) among the medical professionals who care for pregnant women.

More specifically, I explore physicians' knowledge about physical activity during pregnancy, their attitudes towards maternal exercise as well as how they present this information to pregnant women in the course of prenatal care. This chapter builds upon our understanding of the messages that women receive about pregnancy and exercise in

contemporary neo-liberal society, allowing for a consideration of how these messages compare to/interact with those circulating in the popular literature which (as outlined in the previous chapter) largely construct the pregnant body as 'at risk' and provide advice on how to manage this risk in order to be 'fit for two.' Thus, this chapter provides insight into the role that physicians play in the regulation of the active pregnant body and how 'doctor talk' about maternal exercise fits into the promotional logic of neo-liberal society, more generally.

The interviews were conducted with 10 physicians between October 2007 and December 2007. Seven of the participants are general practitioners or family practitioners (3 female and 4 male) and three are obstetrician-gynecologists (1 female and 2 male). All are Caucasian and had between 12 and 39 years of experience practicing medicine at the time of the interviews. Eight of the ten conducted their medical training in Canada while one of the female general practitioners (GPs) was trained in the United States and one of the male GPs was trained in England. Although the sample lacked racial diversity and was relatively small in size, it was comprised of individuals of both genders and a range of ages (and years practicing), allowing for a variety of perspectives to be examined. While I am unable to make broad generalizations from the data, several common themes emerged which provide a starting point for understanding how physicians approach the issue of exercise during pregnancy.

There are limitations, however, to using physician interviews to examine how doctors construct ideas or knowledge about prenatal exercise, a central one being that I was not able to examine 'texts in action,' to borrow a term from Dorothy Smith (1999). In other words, I was only privy to the physicians' reports or constructions of how they

approach the issue with patients and was unable to observe the actual doctor-patient interactions and the power relations involved. Moreover, the insights into the physician approaches to pregnancy and exercise described in this chapter are not indicative of the manner in which they may/may not deal with other aspects of pregnancy. For example, one physician appeared to take a women-centered approach to the issue of exercise and pregnancy, explaining that he tells women to listen to their bodies with regard to setting exercise limits. However, his comments regarding pregnant women as 'hysterical' and his desire to be in control of the birth experience belies a women-centered approach:

> I don't want a woman who's passed out and can't push because she's so zonked and you don't want someone who's hysterical. You want to try- it's in **my** best interest to keep it as pleasurable for them because that makes it **easier for me**. (*Male GP, practicing 26 years – emphasis added*)

In short, I can only speak to power relations as they pertain to prenatal exercise – and even this is in a limited manner given that I am working from the doctors' constructions of events.

The terms 'majority,' 'several,' and 'a few' are used frequently throughout the presentation of results to quantify how many of the participants appeared to subscribe to a particular idea. 'Majority' indicates that almost all of the participants expressed a certain idea (7-10); 'several' meant that between 3-6 participants felt the same way about an issue; and 'a few' indicated that one or two expressed a certain opinion. I also use the symbol '>' to indicate a pause in speech of about one second.

My findings are divided into three main sections. In the first I provide a brief discussion of the physicians' knowledge sources about exercise during pregnancy. In this section I focus on what doctors report having learned about the topic in both medical school and during their careers (in continuing education courses and/or through the

literature they read) and discuss the extent to which knowledge from the scientific realm appears to be used by the physicians to construct women's experiences and understandings of exercise during pregnancy. With this background, I then examine the advice that physicians offer to their pregnant patients with respect to how much and what types of activity they should engage in. The findings from this section provide insight into the complexity of messages about exercise and pregnancy currently in circulation and raises epistemological questions regarding what types of knowledge (or ways of knowing) are in the best interest of pregnant women. In the final section I discuss physicians' ideas regarding the importance of exercise during pregnancy and, more specifically, the role the doctors appear to play in disciplining the pregnant woman to be 'fit for two.' I conclude the chapter with a brief discussion of power relations surrounding doctor-patient interactions as they pertain to exercise during pregnancy, also questioning the extent to which physicians may be considered the 'experts' on prenatal exercise in contemporary Western society.

Physician Knowledge about Exercise During Pregnancy

A 'Disconnect' Between the Scientific Realm and Physician Practices

Based on the interviews, it appears that prenatal exercise is not a central focus of physician education, either in medical school or continuing education classes attended by doctors. Indeed, all of the participants indicated that they had learned little to nothing in medical school about exercise during pregnancy – or at least that they could remember. A few explained that they had vague recollections of learning about heart rate or the dangers of exercising on your back while pregnant, but none could recall anything more specific than this:

> I finished medical school in 1978. You can imagine that's almost 30 years ago! ...Oh, I can't remember whether I was taught anything. I can't remember when I paid attention to that stuff...I can remember at some point I was taught that around heart rates ideas. That exercise was okay as long as you kept your heart rate within a certain range. I think like lower than what you would expect a normal fetal heart rate to be. So like not more than 140 or 120, something like that. (*Female GP, 30 years*)

> Probably next to nothing. The main thing probably is don't let the, the, the uh, women lay on their back. And um, which I'm not sure even still applies. (*Male Family Practitioner, 35 years*)

Given that the majority of my sample attended medical school over 20 years ago, it is possible that they did, in fact, learn about prenatal exercise but simply cannot recollect the teachings. However, comments by a younger female physician (who had been practicing for 12 years at the time of the interview) suggest that the lack of attention to the topic in medical school is not a generational issue, for she also noted that she had learned very little in her training:

> **Doctor:** I can't even seriously remember what I was taught, but it was pretty limited.
> **Interviewer:** Okay. And so when you first began practicing medicine, what advice did you tend to give to women about prenatal exercise?
> **Doctor:** Basically, just told them to, you know, listen to their bodies
> **Interviewer:** Mmhmm
> **Doctor:** um, not get overheated. Um, that it was good to stay active. Um, not to do contact sports, um, especially beyond about 12 weeks...Yeah. Basically just common sense?
> **Interviewer:** Okay. Yeah. And how did this advice compare to the general ideas in the medical community at the time?
> **Doctor:** Ummm. It sort of. I guess that's the little bit that I was taught was, was basically that? (*Female Family Practitioner, 12 years*)

I also had a physician in my sample that can be considered an 'expert' on exercise during pregnancy and according to her, the topic is still not being covered in depth in the medical school curriculum:

> It's not being covered at all. No. I mean, I have medical students here [at her practice] and they don't know anything about it. No. *(Female GP, 19 years)*

My own investigation revealed that exercise during pregnancy is not listed in the actual UBC medical school curriculum, although it is supposed to be covered in the half day session in which prenatal visits are discussed. It was further explained to me that the teachings on prenatal exercise are not necessarily standardized (i.e., based on SOGC or ACOG guidelines) because although the preceptors generally base their teachings on evidence-based medicine "there are some older preceptors out there!", the inference being that they would not look to such literature (Personal email correspondence, November 29, 2007).

In addition to the limited attention to the issue in medical school, a few other physicians noted that to their recollection, exercise during pregnancy has never been covered at education courses/conferences that they have attended. As one explained:

> ... I go to continuing medical [education] classes all the time. I was at one last night and um, one topic you never hear about is, almost never, because it's just assumed everyone knows, is routine prenatal care. You just don't. You'll hear about a new test that they're recommending or a new genetic screening test that's coming out but isn't available yet. Um, you'll hear about the changes maybe in recommended weight gain, but you don't hear people coming out and speaking about what we think everybody should know. *(Male Family Practitioner, 35 years)*

In line with this physician's comments, many of the physicians that I spoke with did not appear to be aware of the growing emphasis in the scientific literature regarding exercise as a way to control pre-eclampsia and gestational diabetes, and several did not appear to be aware of (or at least draw upon) the SOGC or ACOG prenatal exercise guidelines when providing exercise advice to pregnant women.

In these instances, then, it appears that there is a 'disconnect' between the scientific realm and realm of medical practice. Although exercise during pregnancy has become an area of specialization within the medical and scientific realm, the majority of

the doctors that I spoke with do not appear to be up-to-date on current literature. Instead (and as I discuss in the following section), the advice that they provide to their patients is largely informed by their own clinical experiences and their basic understandings of the physiological changes that occur to the pregnant body (and how exercise during pregnancy might interact with these changes). In short, exercise advice appears to be based largely on 'common sense knowledge' - exactly what the scientific realm is trying to avoid through scientific research and the creation of standardized, evidence-based guidelines.

The fact that many of the physicians that I spoke with do not draw upon the knowledge on maternal exercise produced in the scientific realm is not necessarily a sign of resistance to evidence-based knowledge and medical guidelines. Indeed, several doctors appeared quite interested in learning more about the topic – although they did mention that it would need to be clear and concise as they have little time for extra reading and are already inundated with paperwork/information:

> I guess what would be the most helpful to me is if there was some, a really nice simple journal that looked at some very basic things like diet, exercise. You know, very basic things of pregnancy, and it was very simple (laughs) and you know, that had references that if I do want to look up something then I can go look them up but that somebody else can sort of give me a nice little capsule summary on a really really laid out, like really easily laid out page that's not going to take me very long to read. That if I do want to sort of delve into it further I can, but that I can kind of just get "this is a snapshot. (*Female Family Practitioner, 12 years*)

> Yeah, a one-pager…A little data rather than opinions. I get lots of opinions. I'd like a little fact. Would probably be useful for people. Most physicians are busy and don't have a lot of time to read a lot. (*Male Family Practitioner, 34 years*)

The physician who had written the book on exercise during pregnancy commented on the information sources most respected by her colleagues:

> So it has to be presented in the appropriate way where the proper studies have been done and then you can recommend to your patients…it's not some pamphlet that shows up in their office. They don't care about that. It's um, what do the journals say? Is it peer reviewed? All these things that indicate that thankfully as time has passed exercise has [passed the test]. (*Female GP, 19 years*)

Thus, the apparent disconnect between the scientific realm and physician practice is not necessarily an indicator of physician resistance to new risk technologies and information but rather lack of time and/or energy to keep up with the proliferation of new risk technologies in a information-rich society. That said, a few were resistant to (or at least questioned) the idea that more science-based information or medical guidelines would necessarily be helpful. One pointed to the plethora of new knowledge constantly being put into circulation:

> You know how many guidelines we get a week from every section of medicine to the point that most people throw them out and just keep doing whatever their practice is? I don't have time to read the literature and read the guidelines and uh have a life and do my paperwork after the office. I mean, and I'm not an exception. I have medical legal reports to do, I have insurance forms to fill out, I have a talk to go to to keep up in a certain field. (*Male Family Practitioner, 35 years*)

Another explained that he would be interested but surprised if he learned anything new:

> I'd be reading it initially or skimming it initially to make sure that what I was doing or what my beliefs were, were in keeping with the current trend and I would be surprised if there was anything, I can't- it would be nice to have more back up for your, your feelings. I mean, um, but I would be surprised if there was any radical changes. I mean, I would be surprised if someone was going to advocate more heavy exercise and I'd be surprised if someone was going to advocate less. (*Male GP, 26 yea*rs)

One physician who appeared quite interested in learning more about scientific 'facts' and knowledge then questioned its usefulness:

> … would it make any difference if we could tell people what their risk of injury was? … Should I tell those people not to ski? Or not to bike ride? Or not to – I mean, how often do pregnant women fall off a bike? …I don't know. You can give mothers stats about injuries for kids on bikes, will they keep their kids off a bicycle?

> (laughs) Probably not… Yeah, so, I don't think that stuff would help us, that kind of research will help us very much… *(Female GP, 30 years)*

Paradoxically, she then asked me: "Do you know anything about all that weightlifting stuff and pregnancy?" She explained that she might as well ask in case she can "give scientific information to people as opposed to just common sense." Thus, she recognizes the limitations of scientific 'fact' but still privileges it as a form of knowledge, illustrating the complexity of the issue.

Exercise Advice: Setting the Limits

"Listen to Your Body": Privileging Lived Experiences

The majority of the physicians interviewed do not appear to dwell on the possible risks related to exercising during pregnancy. Instead, they suggested that it is safe as long as the pregnant woman simply listens to her body during exercise. Several participants indicated that they provide very little in the way of guidelines, privileging women's embodied experiences instead:

> Basically I say "do what's comfortable." I tell women that pregnancy is not a disease state, so if you feel up to it, exercise. I tell them that the ligaments will loosen up so to allow room for the pelvis to expand. So that if you find that your knees hurt or your back hurts, whatever, by doing exercise, then don't do those exercises. Modify them. (*Male Family Practice, 35 years*)

The same physician went on to explain:

> Basically, I don't give a lot advice on exercise because I think basically if it hurts don't do it. The whole thing that Jane Fonda started, which is so wrong, you know "no pain, no gain" is totally wrong. We know that. So I tell them that if it hurts, don't do it. If you get light headed lying on your back, don't lie on your back and do what you can do comfortably. Women, pregnant women fatigue more easily, especially in their first trimester and then near the end. And there's physiological reasons for that. So I say rest. Get your rest. (*Male Family Practice, 35 years*)

A female general practitioner explained that she provides women with information about the potential risks of exercise during pregnancy (e.g., the consequences of falling when

rollerblading or skiing; joint laxity which can increase chances of dislocation) and then engages in a conversation around what is best for that particular woman, noting that each patient is different in regards to what they are comfortable with in terms of 'risk':

> I think that as my approach to care personally became more women-centered or patient centered that I became less prescriptive in that area and gave women advice to help them make their own decisions around exercise that made sense to them. (*Female GP, 30 years*)

Later in the interview she noted that:

> I usually reassure them that, um around just listening to their body and if something makes them uncomfortable they shouldn't do it, but if they're comfortable doing it, it's fine. And around uterine tightening, if you're not having threatened preterm labour, I tell them not to worry about it...unless it's uncomfortable and they have to stop. (*Female GP, 30 years*)

Another physician explained that he viewed strict advice to be counterproductive to the doctor-patient relationship:

> **Doctor:** I tend to encourage people to use their common sense. Keep balance and I don't give a lot of instructions. I find that's counter productive.
> **Interviewer:** Okay. And you say counter productive. What do you mean?
> **Doctor:** Well >>> I don't like to be seen as saying "Thou shalt do this. Thou shan't do that. You should do this." I don't, I'm not that kind of- I don't like to do that. Unless someone's got some really good evidence that this is bad and this is good. (*Male GP, 37 years*)

These physicians appear to believe that the embodied reality of the pregnant woman (i.e., the physical reality of a larger belly, loosened joints, etc) will naturally limit her activity level so that strict medical guidelines are not necessary. There is also an element of physician trust, however, that the woman is in tune with her body and will listen to it. This stance provides a more nuanced understanding of the Foucauldian notion that power, as it operates in the medical encounter, is a disciplinary power that provides guidelines for how patients should "understand, regulate and experience their bodies"

(Lupton, 1997, p. 99).[222] In these instances, medical knowledge is not being put to use in the regulation of the body, as women are instead told to trust their embodied experiences to help them define safe limits. Doctors, as central figures in the medical profession, are still shaping women's understandings of prenatal exercise and their bodies, but the advice is not grounded in medical knowledge per se. Suggesting that women listen to their bodies to gauge appropriate exercise levels/practices places the woman in the position of 'expert' and 'knower' of her own body which is very much in line with feminist approach to the female body (see Smith, 1999). Significantly, this approach stands in contrast with that taken in the popular literature where I found that 'listen to your body' was sometimes cited but often posed in such a way to pathologize the pregnant body (i.e., exercise during pregnancy was constructed as a risky endeavour for the pregnant woman such that she had to be ever vigilant to 'listen to her body' to avoid injuring the fetus or herself).

Moreover, several of the physicians indicated that they do not discourage women from engaging in certain activities that are constructed as 'high risk' within both the ACOG and SOGC guidelines (such as horseback riding and skiing):

> I mean, um, the only thing you can't do is scuba dive and that's simply to do with the nitrogen end of things. I mean, not the- and horseback riding isn't considered a good sport in pregnancy but there's so many people in the Langley area that ride, that it probably isn't a good sport to take up when you're pregnant but if you've been pregnant and you're used to riding then I just say "you pick the horse and you pick how much you want to ride and continue on through your pregnancy is fine". I mean, it's not like you want to get on a bucking bronco when you're going to deliver, but if you've got a nice horse and you want to walk and do stuff and you're used to it, there's probably no difference than when you weren't pregnant as long as you kind of tone it down. (*Male GP, 26 years*)

[222] While the Foucauldian perspective does not use the term 'medicalization' and has a more nuanced conception of power relations than that put forth by proponents of the medicalization critique, Lupton notes that it still presents a "consonant vision of a world in which individuals' lives are profoundly experienced and understood through the discourses and practices of medicine and its allied professions" (p. 94).

> I would say "if you're a good skier and you're comfortable and you want to continue I don't have a problem but I would suggest that you avoid the double blacks and the blacks and you stick to the green runs." And they understand perfectly what I'm saying by that. So I give them that analogy. And I say "that's how you should apply it to all things. You want to minimize the risks of having a high speed tumble." And so I explain I wouldn't take up parachute gliding and I wouldn't take up horseback riding where there's a lot of uh, bumping, but I mean, I also have people who are excellent horseback riders and kept horseback riding through it or up to later than you would conventionally would have done. And I don't see a problem with that. So I don't stick my oar in too much is what I'm trying to tell you. (*Male GP, 37 years*)

> It seems to me people can ride horses and go skiing. I mean there's a lot of concerns about certain kinds of exercise, but I think, you know- But a pregnancy that's healthy is very stable. (*Male Family Practitioner, 34 years*)

Another male family practitioner of 35 years also explained that he felt that downhill skiing and horseback riding were safe during pregnancy:

> So I just tell women that if they want to ski, from a physical point of view, if their centre of gravity is off, fine. Just back off the bumps. Go to easier runs. Do cruising runs. And, make sure you know that you're going to have to pee a lot. So. Anyway. And that's all. I don't restrict a lot in the way of exercise. I don't consider pregnancy a disease state. (*Male Family Practitioner, 35 years*)

This more relaxed approach appears to be informed by his past experiences in which patients had fallen while horseback riding:

> The injuries, when they come in in a panic, is when they've fallen off the horse and they're panicky that the baby is hurt and I've never seen a baby that's been hurt. We check the heartbeat and it's still there. Fetal heart- baby's better protected than we are. It would take a pretty major blow to the abdomen to harm a baby. And so mom may deliver in a cast, when she's fallen off the horse (laughs) but the baby's fine. (*Male FP, 35 years*)

Of the physicians offering the advice to 'listen to your body,' a few were not as relaxed about activities where there is a risk of collisions and/or falls. One female GP explained that while she doesn't forbid such activities, she discusses the possible risks and encourages women to decide for themselves:

> Well, early in pregnancy they're pretty, you know the uterus is a strong muscle and they're not going to do any damage to the pregnancy short of a direct blow and um, that they need to protect themselves from injury in general for their health and [people make decisions that make sense to them]. You know, a lot of people wouldn't do ever in pregnancy what other people do. They make individual decisions. I warn them about joint laxity and the potential for dislocation being much greater in pregnancy than in non-pregnancy and that they should be aware of that and um, be careful if they're wanting to play a sport (*Female GP, 30 years*)

She related a story of a patient who saw her earlier in the week who wanted to downhill ski during her pregnancy. While the physician did not necessarily agree, she did not vocalize her objections outright:

> There was somebody that came in this week, with a new, a first prenatal visit. And they'd moved out here from Toronto temporarily. He's in the movie business, and one of the things that they were really keen on about moving out here was the skiing. And now she finds herself pregnant before she'd expected and so they say to me "Well, what do you think about skiing?" >> Do you really want to be hurtling down the slopes when you're > pregnant? (laughs). Must you? But, I just >> introduce it as a safety issue…

The above example provides evidence to suggest that although she may view certain activities as 'risky' her women-centered approach means that she does not 'forbid' certain activities. Thus, for some physicians, it may be that their beliefs about the dangers of physical activity during pregnancy remain, yet their approach to doctoring (women-centered) means that they let women decide for themselves (versus traditional, heavy-handed style that feminists have critiqued in the past). Exercise advice may therefore be shaped by both the physician's knowledge and beliefs about exercise and physical activity but also by her/his approach to doctor-patient interactions, more generally, adding a level of complexity to the analysis.

Providing further nuance to this privileging of women's experiences, a few physicians were slightly more prescriptive in their advice, providing heart rate guidelines or advising patients to avoid exercising on their back. That said, they also encouraged

their pregnant patients to use their embodied experiences and own common sense as a gauge for appropriate activities and activity levels:

> I try to keep it simple. Just don't exercise on your back, um, get on an incline. Talk test...We have them do things like avoid one leg stands after 24 weeks because of the pubic symphisis issues. Um and I always tell them to make sure they're, because pregnancy is so dynamic, that they do it with a qualified fitness professional. At least get some guidance. Check in once a trimester. You know, "this is okay. What's different?" Normally they're checking in with me but again, check in with somebody. *Listen to your body.* Big. Big, big, big. (*Female GP, 19 years*)

> **Doctor:** I mean some women have asked about you know, continuing to run in the first trimester or even throughout their pregnancy and stuff and so, I had read a little bit about that, just because I used to run. I stopped running before I got pregnant, but um, and it, I just basically tell them, again, listen to their body, not getting overheated. Probably only doing about 70% of their maximum heart rate at the most?
> **Interviewer:** Okay.
> **Doctor:** And uh, you know, just basically just dialing it down a notch? Just not doing quite as much, not quite as often, not quite as intense?
> **Interviewer:** Okay
> **Doctor:** But basically that they can stay active. If they were previously active, they can, as long as they dial it down a little bit, they can stay just as active. But not to sort of > start out, you know, if they weren't ever a runner, to suddenly become a runner in pregnancy is not a good idea. (*Female Family Practioner, 12 years)*

> You can give them formulas and you can go over the training guides. Most of the, I mean I have women who have run through their whole pregnancy. It's not something I would recommend. Running with a watermelon doesn't make a whole bunch of sense. So you try to detune them into things like swimming. The simplest thing is, if you usually tell somebody that if they can carry on a conversation, even an imaginary one, then, and they're not puffing and out of breath and they're generally exercising at a reasonable rate. (*Male GP, 26 years*)

It is worth noting that the three physicians who provided this more detailed advice were the youngest of the sample, all had a special interest in physical activity/sport during pregnancy and had done extra research on the topic. In other words, they appeared to have more of a knowledge base of the medical guidelines and literature. The general philosophy of 'listen to your body' underpinned their advice, but they had more detail to further expand upon this vague guideline.

Overall, the majority of the physicians that I spoke with do not appear to view pregnancy and/or the female body as pathological and in regards to the topic of prenatal exercise, they do not feel compelled to impose strict guidelines. Instead, they take a more woman-centered approach, trusting women to 'listen to their bodies' and define their own limits. In this sense, 'common sense knowledge' is equated with the *women's* common sense knowledge about her own body. Even for the physicians who provided slightly more guidance and suggested that certain activities are unfavourable, 'listen to your body' was the ultimate gauge of activity level for women. The result is advice that is less restrictive than the 'official' medical guidelines (especially those put forth by the SOGC) where concerns around overexertion and jarring linger because there is currently a lack of randomized control trials showing that such activities/situations do *not* harm the pregnant body. Significantly, there is also a lack of evidence that such activities *do* harm the pregnant body, but where pregnancy is concerned, uncertainty results in conservative measures (Armstrong, 2003, p. 107) and the onus is on woman to manage risk by monitoring their behaviours and often times restricting their lifestyle.[223]

The interview findings in turn raise questions concerning the type of knowledge (or ways of knowing) that most benefit women with respect to exercise advice: guidelines put forth by medical organizations (based on evidence-based knowledge) or common sense knowledge (which often is equated to privileging women's lived experiences of their bodies)? From a feminist perspective, trusting pregnant women to listen to their bodies in order to monitor and regulate their own exercise activities is a

[223] Holmes et al. (2006) have critiqued the evidence-based movement and in particular, the manner in which the scientific realm privileges certain types of knowledge (randomized control trials) and subjugates alternative ways of knowing.

positive development that is potentially empowering for women. Ironically, however, the centrality of 'risk' in the governance of contemporary pregnancy (and the internalization of this risk discourse by women) means that vague advice such as 'listen to your body' might disturb women who would prefer to have standardized and prescriptive advice (even if it is more restrictive). Moreover, we must remember that 'common sense' knowledge of physicians was, for many years, based on long-standing biases regarding the weakness of the female body and the view that women's ultimate role in life is motherhood, the result being unnecessarily restrictive exercise prescriptions. And while limited, I found evidence to suggest that such ideas linger amongst doctors.

"You Will Fall on the Handle Bars and Kill Your Baby": A 'Risk-centered' Approach

Given that many of the physicians base their exercise recommendations on their clinical experiences working with pregnant women, it is perhaps not surprising that the obstetrician-gynecologists (ob-gyns) that I spoke with appeared to take a more 'risk-centered' approach to exercise than the GPs. A female ob-gyn explained that just over half of her patient-base is considered 'high risk' (the remainder being classified as 'normal' risk) and she seemed to view all pregnant bodies as inherently 'risky' - regardless of their risk classification. Consider her concern about the clumsiness of the pregnant woman:

> The other big issue that is always in my mind when I'm talking about exercise and pregnant women is the issue of their clumsiness. They have the tendency to have more injury and um, uh, falls and stumbling and their balance problems. Which is not only mechanical but it's also at the level of the brain and neuronal pathways...So whatever exercise they choose, I always tell them to be very cognizant of that [changes in balance] with respect to the injury rate of falling. So when you're talking about people that do, you know, step classes and anything that

requires balance and proprioception, they're going to be, they're going to find it harder and they're going to be a little more vulnerable. (*Female Ob-Gyn, 25 years*)

When pressed as to her primary concerns around a fall she explained:

> **Doctor:** Oh, it's placental injury, basically. I mean, abruption and uh, so, I mean, once that uterus is outside of the pelvis and you impact it, with any direct impact, your injury to the placenta is very significant. The baby is well-protected. It's the placenta.
> **Interviewer:** Oh, okay. And how much force does that take to?
> **Doctor:** You know, it doesn't take very much. Um, a direct impact to the placenta. Depends on where the placenta is. But if your placenta is sitting on the front and you get booted by the child or you have a forward fall and, and hit it. Or a seat belt injury in the car. I mean, it's like – I never forget this paper I read which describes the uterus as a tennis ball and the placenta like a potato chip inside the tennis ball. So all you, you don't have to do very much. The placenta is very vulnerable. The baby is not, in the sense of injury to the baby. But the placenta is the lifeline. So if you crack that placenta, you know.
> **Interviewer:** Right. Okay
> **Doctor:** So that's why sports like skiing, where someone might come plowing into you, or uh, you know, horseback riding where you can fall off, you can injure your placenta. So those are the sports that we generally, we tell them to lay off them.

The simile of the uterus as a tennis ball and the placenta as a potato chip inside the tennis ball is striking and illustrates that this physician's beliefs about the pregnant body vary from those of the male family practitioner who suggested that a fall from a horse might leave the mother in a cast but will not harm the fetus.[224] Given the complex nature of pregnancy and the difficulty ascertaining the causes of miscarriage and preterm labour, there really is no definable 'truth' of the matter - one view is not necessarily 'right' or 'wrong.' This example, however, provides evidence to suggest that a specialty area such as obstetrics and gynecology might have a different 'culture' than that of general practitioners. As such, the specialists may understand of the risks of pregnancy differently and promote a medical 'truth' that constructs the pregnant body as 'at risk'

[224] Her concern regarding the risk of a seat belt injury in a car also stands in contrast to a few of the other physicians who noted that they have had pregnant patients in serious motor vehicle accidents with no harm to the fetus.

and exercise as potentially dangerous. Indeed, while this physician indicated that she encourages her patients to exercise, her discussion was more risk-focused than the GPs cited above:

> **Doctor:** And um, I will say that if they have been, if they've had a regular exercise program it's generally very safe to carry that on and if fact it's probably a good thing. You know, it's good to maintain their fitness barring those things we've already talked about. You know, watching out for um, your lack of stability, your clumsiness, your tendency to fall. And if your sports that you've, if the sports you've been involved in are those that would put your uterus at risk of impact, then they need to be dropped or modified.
> **Interviewer:** Okay
> **Doctor:** But if they have been, let's say they are runners. I would say "there's no reason you have to stop doing what you're doing unless I pick up a placental insufficiency problem or a complication of your pregnancy. If you maintain a nice normal pregnancy, you can carry on with your activity. I'll tell you that I think you need to stop if I find something abnormal about your situation with your pregnancy". (*Female Ob-Gyn, 25 years*)

In this example, exercise is encouraged but the patient is clearly under the surveillance of the physician, who appears to use the central strategies of disciplinary power, namely observation, examination, measurement, and comparison to norms (in her case, the 'norm' is a high-risk situation) to persuade her patients to behave (and think) in a certain way.

The comments made by a male ob-gyn who has been practicing for 39 years indicate that he also takes a 'riskier' view of the pregnant body and feels compelled to assert more control over the physical activity of pregnant women. For instance, he was the only physician to point to the potential dangers of swimming, a non-weight bearing activity that is generally viewed as an excellent activity for the pregnant woman:

> **Doctor:** So, they'll say "yeah, well what exercise can I do?" Well, anything that you want to do that doesn't put excessive on those various joints in your body that are loosening up. So think logically. If you are swimming, that is great. It's a non-weight-bearing exercise but in certain types of swimming you're still going to put a lot of stress on certain joints. So remember that they're at risk. So do your exercise

> with less intensity, whatever you do. With maybe more frequency and less um, less um…
> **Interviewer:** Intensity?
> **Doctor:** Intensity. Power, you know. So that's one thing. And don't do anything that's going to physically put you at risk because your sense of balance is off. Your centre of gravity's changed. So you wouldn't ride a bicycle on the street. Because you will fall on the handle bars and kill your baby.
> **Interviewer:** Mmhmm
> **Doctor:** And not to mention spraining your ankle and getting a cruciate tear of your knee. On the other hand, ride a stationary bicycle because it's non weight-bearing. It's a great exercise for your muscles without stressing your joints. It's a really, it's very, very boring so watch television.

The ominous warning that you "will fall on the handle bars and kill your baby" (even if perhaps said in jest) is reminiscent of advice from the early twentieth century. In addition to a detailed discussion of the physiological changes occurring to the pregnant body and the cautions this requires, he indicated that he has also developed a prescription for rest that he always reviews with his patient:

> Look. You're 15, 18 weeks now. We've got to talk about how you're going to feed your baby. And you've got to get that food into the baby somehow um and it's, it's competing with you. So you're a bit of a jock and you feel good therefore your baby must feel good. Wrong…And I talk to my patients this way. All the time. Because >, and I don't think it's talking down to them, it's helping them get a visual picture of what's going on with themselves. (*Male Ob-Gyn, 39 years*)

The above quotation illustrates how he constructs the mother-fetal relationship as adversarial and passes this viewpoint on to his patients. He went on to explain:

> I'll usually make a contract with the people about rest. I'll say "let's start with 15 to 20 minutes, three times a day, by the clock, with your feet up and head down and tell me in 4 weeks how it went"….And they're always kind of squirmy when they come back in next time (imitates 'squirming'). "Well, I didn't have time for that." And that's when I'll say, "Well you know, it's interesting, isn't it? You actually think you're going to take care of a baby > when you can't even now take 15 minutes 3 times a day for this baby now? (*Male Ob-Gyn, 39 years*)

He was the only physician to indicate that he prescribes rest to all of his patients (even the ones who do not have high risk pregnancies). The other participants indicated that they

might prescribe rest for some women, but only those with complications such as risk for preterm labor or vaginal bleeding – and even then the amount of rest would vary based on the severity of the condition. Perhaps most striking, however, is the heavy-handed manner in which he seems to present his advice. Indeed, his approach to (female) patient care is characteristic of that critiqued by feminist scholars whereby the (male) physician assumes a position of authority and power, 'educating' the female patient who is to follow his directives, pathologizing the female body in the process (see Cahill, 2001; Ehrenreich & English, 1978). Again we see an example of how doctoring style can combine with beliefs/knowledge about exercise during pregnancy to impact the advice provided - but instead of taking a women-centred approach this physician assumes an approach that is quite the opposite, the result being restrictive and possibly anxiety-arousing prenatal exercise prescriptions.

A broad trend to emerge from the interviews was that the doctors who deal with low risk pregnancies in their day-to-day practice (i.e., general practitioners) gave less restrictive advice and generally viewed pregnancy (and prenatal exercise) as less risky than the obstetricians. The situation is, of course, more nuanced than a polarization of less restrictive advice ('listen to your body') and more restrictive advice (prescriptive, surveillance-based) according to one's grouping into different professions (and therefore their clinical experiences). In other words, one cannot suggest that all obstetricians are more cautious and all general practitioners less. That said, I conducted interviews with two midwives who also train midwifery students (not discussed here) and found that the participant who taught a midwifery course on the 'risks' of pregnancy was more conservative/risk-centred in her advice while the other midwife (with more of a general

focus) was less conservative offering advice more in line with "listen to your body." Thus, the 'doctor talk' of professionals dealing with higher risk pregnancies may work to construct a social world in which pregnancy is a risky proposition needing more surveillance. This observation, while preliminary, is in line with Armstrong's (2003) study of Fetal Alcohol Syndrome (FAS) in which she spoke with family practitioners, obstetricians and pediatricians and found that their perceptions of risk and of responsibility varied by specialty.[225]

My intent is not to critique the idea that women with high risk pregnancies need rest and should avoid strenuous exercise, for such precautions may very well be prudent. I would like to bring to light, however, the possibility that physicians dealing with high risk situations may view *all* pregnancies as riskier, even those that might have 'normal' pregnancies, and impose limitations on the activities of women who do not necessarily need such restrictions (as was case with the male ob-gynecologist). And even if they do not impose limits, their understanding of the pregnant body as 'at risk' likely is communicated to their patients in subtle (or not-so subtle) ways that may arouse patient anxiety and lessen the pleasure of engaging in exercise while pregnant – and of their experience of pregnancy more generally.

In a related point, it is also crucial to consider how a woman's categorization into a 'high risk' pregnancy category may impact her activity levels as she internalizes this categorization (or medical 'truth') and self-polices her behaviours. Comments by

[225] Drawing on the work of Berger and Luckmann (1967, p. 19), she explains that the "knowledge that guides conduct in everyday life" varies somewhat among the specialties. More specifically, she found that the type of patient the doctor felt responsible for influenced how they made sense of the risks posed by drinking during pregnancy. Obstetricians, for example, tended to be more concerned about the harms the pregnant drinker inflicts on herself as well as her child while the pediatricians tended to be more protective of the unborn child (their prospective patient).

another obstetrician (who specializes in maternal-fetal medicine) suggest this may indeed occur. He explained that all of his patients are classified as 'high risk' and some of them are hospitalized during the course of their pregnancy. Despite this classification, he did not appear concerned about the potential risks of exercise during pregnancy, which seemed somewhat strange until I realized that he was defining physical activity as 'moving about' and not necessarily the more rigorous practices of aerobic exercise/weight training.[226] Much of the interview centered on his concern that his patients need *more* activity. Unlike the other two obstetricians that I spoke with, he viewed being at risk of preterm labour as one of the only reasons to 'take it easy' and believed that many women take the high risk categorization too seriously. He further explained that there is a lack of evidence that complete bed rest leads to better pregnancy outcomes and "in fact, there's some evidence of poor outcomes with strict bed rest." The comments that follow illustrate how, in his view, women internalize the 'high risk' categorization and limit their activities to a dangerous level:

> I think most people are compliant [with advice to avoid strenuous exercise]. Uh, some people are overly compliant. It's rare to see someone who is non-compliant. Who would not listen to us. And she's going to run her marathon. Unusual. What we see is the opposite. We say, "you need to get up, you need to use your muscles. You need to get up, walk around. You know. Don't take a bath, take a shower so you're moving around a bit more. Um, get up and make meals, no strenuous exercise but [moving] around." And we find that they don't even do that. They go towards the more strict bed rest type. (*Male Ob-Gyn, 33 years)*

Because of the long medical tradition of viewing the pregnant body as 'diseased' and 'at risk' (and current pressure on pregnant women to manage pregnancy risk), we must

[226] He explained that his patients do not engage in 'strenuous exercise' and how they have a 'rigorous' categorization of appropriate activity levels in place at the hospital to help the nursing staff assess what exercises the patients are allowed to perform.

be mindful of the discursive power of a 'high risk' categorization and how it impacts upon women's experiences of pregnancy as well as their activity levels.

Physicians' Perceptions of the Importance of Exercise During Pregnancy

"Exercise Remains One Tick in the Box": Important But Not Crucial to Prenatal Care

Just as the majority of the physicians interviewed did not dwell on the risks of exercising in their exchanges with patients, nor did they dwell on the risks of *not* exercising. Simply put, most of the participants did not view exercise as being an essential part of the prenatal care programme. This is not to say they did not recognize the benefits - and even the importance - of exercise during pregnancy. A few noted that it improved feelings of well-being while several noted that it could help to control the amount of weight gained during pregnancy, for instance. But despite this recognition, most of the doctors revealed that they do not dwell upon it in their patient interactions. Lack of time to address physical activity during the course of prenatal care was one reason identified by a few of the physicians for not focusing on the issue:

> The medical community usually just ignores it (laughs). They don't have time, you know. Five minute prenatal visit, the last thing they're going to do is talk about exercise. (*Female GP, 30 years*)

> Um, > there's so much to go over, at so many different stages that I usually try and bring it up at least to some degree on the first or the second visit. And then I usually, like, if there's, especially if there's been like, if weight gain seems to be a bit of an issue or um, you know, if there's other stuff, you know, then I'll usually bring it up a little bit more. Otherwise I'll try and bring it up once or twice more during the – because there's just so many other things that I have to talk about too… (*Female GP, 12 years*)

> **Doctor:** Have you seen the prenatal forms have changed lately?
> **Interviewer:** No, I haven't.
> **Doctor:** Bloody complicated…There's tons of new things all about psychological health, alcohol, smoking, drinking, family history, genetic problems. Um, you know, the emphasis is way on those things and the exercise remains one tick in the box.

> **Interviewer:** Okay, okay.
> **Doctor:** So I don't think it's consuming um, too too much…I really see [interest in exercise] as more generated by women themselves…And I think the majority of women are pretty savvy in terms of being sensible in exercise…So I wouldn't be rushing around wanting to pontificate too much. (*Male GP, 37 years*)

The male physician quoted above appears to believe that women who wish to remain active will, as entrepreneurial citizens, broach the topic with him. Two other male family practitioners who had been practicing for over 30 years shared his viewpoint, indicating that they also do not bring up the topic of exercise during pregnancy unless questioned by their patients. And while not discouraging exercise during pregnancy, a few others questioned the notion that exercise can make for an easier delivery or birth experience:

> …you don't have to exercise to tone up your uterus to help you deliver a baby. Some of the biggest slobs in the world have an easy delivery because > the process of labour and delivery is a function of the baby's position, size, its relationship to your pelvis and the pumping action, you might say, of the uterus. (*Male Ob-Gyn, 39 years*)

The choice of the word 'slob' implies a moral judgment towards individuals who do not exercise, but the key point here is that this physician does not associate being a 'slob' with having a more difficult pregnancy or poor pregnancy outcomes. Being a 'good' mother is not necessarily linked to exercising while pregnant (This may, in turn, be linked to the fact that this physician takes a patriarchal view of the female body, as evidenced by his analogy of the uterus as a machine which effectively takes the woman out of the childbirth process – see Martin, 1987). In fact, another physician explained that prenatal exercise might even be an impediment to childbirth (although he still encourages women who have healthy pregnancies to engage in physical activity if they wish):

> I would like to think that if you were fitter you did a better job, um > but I certainly see terribly out of shape people who do extremely well (laughs)… I remember one patient who was a nurse, a public health nurse. Really interested in fitness. She rode her bike into work. She rode her bike to her labour…She had a perineum that was

> rock hard. Delivering the baby, stretching that perineum didn't happen very easily, right. So in fact being fit there was actually a little bit of an impediment to the delivery (laughing). (*Male Family Practice, 34 years*)[227]

Even the physicians who make a habit of addressing (and encouraging) prenatal exercise in the course of prenatal care appeared reluctant to take a heavy handed approach. One female GP explained:

> I mean there's so many things that people think they need to do just because they're pregnant. I like to encourage an attitude towards pregnancy as being part of your normal life cycle and um it's a good chance to take a look at your health practices in general and if you decide you want to be healthier by better eating, exercise and stopping smoking and doing those kinds of things, it's a good opportunity to review those, but um, it's not like, "now you're pregnant, you *need* to exercise." I would never, um speak like that. (*Female GP, 30 years*)

She explained that she even tells her patients that "it's okay not to exercise…if you don't feel like it and you don't feel good exercising, then it's not right for you. You're not supposed to." A male physician indicated that he might encourage a woman to continue to exercise if she were unfit or had high blood pressure – but clearly stated that he would not dwell on the issue:

> I don't see it high on the radar. I mean *I've never come across an obstetric complication that's directly related to exercise or lack of it*. Other than, supposing they had, were unfit or had high blood pressure I would encourage them to keep exercising? You know? So you might address it but it's not going to be something that comes up and up and up again. (*Male GP, 37 years*)

The italicized text in this quotation (my emphasis) nicely captures the opinion of several of the physicians that the risks of *not* exercising during pregnancy are not "high on the radar" and nor are the risks *of* exercising.

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[227] Of course, the impact of exercise (pre-pregnancy and during) on ease of delivery has been a point of debate since the early twentieth century, as demonstrated by Parry's (1912) survey of physician perspectives on the issue in which she found opinions ranging from the belief that it would harden the perineum and pelvic muscles making for a more difficult birth to the conviction that it would ease delivery. While it is commonly stated in contemporary medical literature that exercise leads to a less strenuous birth, there is still no hard 'evidence' to back this up and it remains a point of contention, illustrating the continued anxiety around the impact of exercise on the female (reproductive) body.

A female physician was more outspoken about the importance of exercise during pregnancy but her comments suggest that she encourages rather than 'enforces' exercise, positioning it as something that can help women feel better (as opposed to something that's going to allow them to be 'fit for two' and have a healthier baby):

> I think it is really, I think it [exercise] is quite important and I should probably spend even more time talking about, but (laughs). I think it is really important for helping with um, not gaining excessive weight. I think it's important with just general sense of well being...I'll often tell women, like, if you don't feel like doing much that's fine but just once you start feeling better, try and get out and do a bit more? Because you actually will feel even better if you, you know within reason, if you get out and do some more. And especially anybody that's complaining of various aches and pains. (*Female Family Practioner, 12 years*)

This physician, in particular, was sensitive to the fact that pregnant women might not feel up to exercising as she herself was pregnant at the time of the interview and explained: "I found I didn't do that much in the first trimester because I just felt so gross." Indeed, a possible reason that the majority of physicians were not insistent that their patients exercise - despite acknowledging the importance of exercise in an individual's lifestyle - is that many are cognizant of the lived realities of their patient's lives, identifying work commitments, family responsibilities and pregnancy-related discomforts (such as nausea, a sore back) as potential barriers to participation in physical activity during pregnancy. One female physician, for instance, identified physical inactivity during pregnancy as a lifestyle issue and also acknowledged that the embodied reality of pregnancy might discourage exercise:

> Well, once it's their second pregnancy, the chance that they find time between increased fatigue and sleeping, work if they're working and their toddler at home is - So it's more lifestyle issues at this [point in time]. And they can't justify it in terms of the demand of family, their family (trails off so cannot hear next few sentences). And the first part of pregnancy, lots of people feel too fatigued and nauseous to exercise. I then I encourage people that when they start feeling better go back to their exercise, of some sort. (*Female GP, 30 years*)

Several others explained that it is difficult to ensure compliance to exercise, especially if exercise was not part of a woman's lifestyle prior to pregnancy, and seemed content not to pursue the issue:

> In my opinion, any exercise is important. You know, we have now an epidemic of obesity which means we have an epidemic of diabetes and heart disease and all the things that go along with it. World Health has just listed, for the first time ever, a non-infectious disease, diabetes, as epidemic. The first time ever. I mean, uh, obesity is- So…I want women to exercise. Uh, if they weren't exercising before they were pregnant, I don't know that we're going to get them motivated when they're uncomfortable. And so I think it's really hard. But um, no, I just tell them to carry on with what they're doing within the limits as to how they're comfortable and um, and how they feel. But I don't give them specific exercise programmes…I don't know specific exercise programmes that, to give them and they're going to do what time permits, anyway. *(Male GP, 35 years)*

> I mean, I think it's the same reason that the rest of us don't do enough. We're just too darn busy in our lives. We don't make time for it. We get tied up in all of this busyness and our fast pace and women who have families and they've got several children and they've got a career going and uh, a relationship, it's just low down the totem pole of priorities. (*Female Ob-Gyn, 25 years*)

> …time constraints is another one? You know, women are already busy and they're already feeling a little overwhelmed by everything that's going on anyway? And so I think that time constraints are sometimes an issue as well, because some women continue to keep on following the same schedules as they did before, except that they're feeling much more tired and everything else. (*Female Family Practitioner, 12 years*)

> Really it's the old story of taking the horse to water and whether they drink it when they get there. It's up to them really what they're going to do about it. Um, so I would encourage exercise but I'm not going to beat the drum about it. (*Male GP, 37 years*)

Interestingly, while these physicians identify lifestyle choices as the main reason that women don't exercise - something that women can change/is under their control - the majority do not appear to judge patients who do not exercise during pregnancy in a

negative light, in large part because they are sympathetic to the barriers women face.[228] In other words, the doctors do not construct pregnant women as needing to engage in exercise in order to be a 'good' mother. This approach varies from the neo-liberal approach that I observed in many of the popular texts where the pregnant woman is entreated to "sweat for your baby's sake" – and key findings from scientific studies were used to underscore the importance of physical activity during pregnancy. As I pointed out in the first section, it may well be that many physicians are not aware of the latest literature identifying exercise during pregnancy as a way to prevent 'maternal fetal' disease, which could account for the more relaxed attitude of some of the physicians. For others, it could well be that an awareness of this literature would not impact the way they address the issue and exercise would still not be viewed as a crucial aspect of prenatal care – either because they are not swayed by the scientific evidence presented or because they do not wish to place undue pressure on their pregnant patients. Indeed, in her examination of doctor knowledge and attitudes concerning fetal alcohol syndrome (FAS), Armstrong (2003, p. 153) found that while doctors felt a responsibility to raise the issue of drinking with patients and to educate them about the risks, they also tempered their messages so as to not induce excessive guilt in the mother. This example is significant as it illustrates that even for alcohol consumption during pregnancy, which it could be argued ranks higher on the 'risk' scale than not engaging in prenatal exercise to prevent obesity and diabetes, many of the physicians were sensitive to their patients' feelings and cognizant of the difficulties in the lives of some of their patients (which might lead to drinking during pregnancy).

[228] There were exceptions, of course, one being the physician who suggested that he has had the "biggest slobs" have easy births as well as a physician who explained that women might not exercise because they are 'lazy' (as I will discuss further below).

"We Have to Get Them Moving": Fit for Two

In contrast to the ambivalence demonstrated by many of the interviewed physicians, a few were more outspoken about the need for women to engage in physical activity while pregnant. As discussed in the previous section, the male ob-gyn (who specializes in maternal-fetal medicine) indicated that he was more adamant that his patients engage in activity during pregnancy, although he was more concerned with keeping women active and moving during pregnancy - even if by such simple measures as taking a shower instead of a bath - rather than aerobic exercise. In his view, simple calisthenics and stretching is an appropriate way to prepare women for the labour and birth experience and his department (maternal-fetal medicine) works in conjunction with the physiotherapy department at the hospital:

> So the typical thing is to use fitness exercises and then stretching exercise is good for the perineum and those kind of issues. So it's really preventive maintenance if you want to. You'd be better fit and better prepared for labour, birth and the immediate postpartum. (*Male Obstetrician, 33 years*)

That said, he explained that he is not overly assertive about the necessity for exercise because he understands that many women continue to associate a 'bad outcome' with exercise:

> ...because of course if there's a bad outcome, it won't be related to the exercise but that's what they're going to see. And because they see one thing...they suspect that one gave the other. And there's, there's no causal association, but that's how women feel. (*Male Obstetrician, 33 years*)

My primary focus, however, is the two doctors who view aerobic exercise as a technique to treat the 'maternal-fetal diseases' of pregnancy. One was a male GP who specializes in sports medicine and the other a female GP who has an undergraduate degree in Kinesiology, which suggests that a personal interest in physical activity might

account for their increased interest in the topic. The male GP pointed to the increasing weight gain of women as indicative of the need for exercise:

> I mean, some women have never exercised. And there's a huge concern now, particularly with obesity and with women being bigger going into pregnancy and we used to say okay, if you gained 24-28 pounds in your pregnancy that was good and now that's, we're kind of down-tuning that because people, to a certain extent, seem to come in heavier, so you're trying to say- and one way of trying to do that is say "try to be as active as you can". (*Male GP, 26 years*)

He went on to explain:

> I mean, you try and keep them to the goal with regards to their weight. You try and keep them at the goals with regard to their fitness. They're just going to feel better afterwards. So, most of, I think that more and more, there's more, more people are trying to do stuff. I mean, I don't mind if it's yoga, pilates, step classes, Curves. I mean, whatever they want to do to try and be active.

He acknowledged the difficulty in getting some women to be active, however:

> Sometimes by looking at people you realize you may have to be more encouraging for them to be active and some other people, I mean, by the looks of and knowing them, you know that that's not necessarily a big issue.

The above quote suggests that this physician judges his patient's health based on their appearance, linking their physical stature with their level of self-discipline. There is a growing body of research that critiques this association of outward 'fatness' with ill health, arguing that there is a lack of evidence to make such a causal association and that hidden within such assumptions is a moral agenda that works to construct obese people as 'lazy' and a drain upon the healthcare system (Campos et al., 2006; Gard & Wright, 2005; Rail & Dumas, 2008). And this physician appears to make such moral judgments as he suggested that a women's inability to exercise during pregnancy was due to 'laziness.' The following comment was in response to my question of some of the reasons (in his experience) pregnant women do not exercise:

> Lazy. I mean, too much to do, lazy. Time constraints. There's always an element of disbelief that it's not, you know, like the smoker who doesn't think it's going to happen to them or somebody who has cardiovascular disease. Sometimes when they can't see immediate benefits, I think there's a little bit of disbelief. That time isn't going to catch up to them and it's not going to be a factor.

This example is interesting as he vacillates between 'lazy' and 'time constraints' before discussing the disbelief of patients that their unhealthy behaviours won't catch up to them, also equating physical inactivity with the social taboo of cigarette smoking. While this physician appears to subscribe to what has been identified by academics as the dominant 'obesity discourse' (i.e., in which one takes a mechanistic view of the body and assumes that there is a relationship between inactivity, over-eating, obesity and ill health), it is difficult to comment on how he broaches the topic with patients – with empathy or instilling a sense of guilt. Regardless, this interview underscores the need to examine more closely how physicians do address the need to be 'fit for two' with patients.

The individual who was perhaps the most passionate about the need for exercise during pregnancy, however, was the female physician who had taken a special interest in the topic early in her career. She has co-authored an instructional book for pregnant women (in collaboration with a physiotherapist and exercise scientist) and has a small business which aims to educate women and health care providers about exercise during pregnancy. She explained more about the philosophy underpinning the book and her business:

> We just started: every woman with a normal healthy pregnancy can and should be exercising. That was our initial mission. Now, with the work around obesity and things like that, we've actually expanded our mission. That we look at it as more of a preventive thing…So we are trying to tackle preconception a little bit. We're trying, I mean the studies are now demonstrating that if a woman is healthy and fit during her pregnancy, she tends to produce healthy and fitter babes which tend to have lower risk of you know, heart disease, high blood pressure, things like that. So our initial philosophy was "get people exercising". But now we're like, "we already

> know they're supposed to exercise? Let's get them doing it." (*Female GP, 19 years*)

The above quotation indicates that she is aware of the growing body of scientific literature linking physical activity during pregnancy with the future health of the child (i.e., the role of exercise in preventing/controlling 'maternal fetal diseases') – and is taking an active role in positioning prenatal exercise as a central element of prenatal care. She went on to explain that she gives educational talks for physicians/health care providers (mostly in the US and UK) with the purpose of increasing their awareness that prenatal exercise is an important health-promoting activity. She is also involved in a project with a local women's hospital that aims to increase the activity level of *all* pregnant women:

> And integrating [exercise] into the public has been a little bit – we're started a programme with Women's hospital. We're getting personal trainers into the prenatal classes to get them actually doing something? We have to, you know, you have to-pregnant women are like sponges. They'll sop up everything? It's just a matter of getting them the stuff. They're so completely overloaded with 50 billion books their friends are telling them they have to read. Um, getting them when they're captive in prenatal classes (cannot hear a few words). You know, you can r-, you can write stuff in magazines and stuff. They'll read it but > Are they going to actually do it?

She elaborated on the programme that is being established:

> We're just trying to put it all together, but what we are looking at doing is working with the Women's Health Research Collaborative which will get trainers in for half an hour, once a week with the prenatal classes at Women's hospital, which will give them, we have to get them moving. We can't hand them something out. It has to be a trainer that will actually do a little 30 minute jig.

The interview with this physician was particularly informative as it showed how the emerging scientific and medical knowledge about the benefits of physical activity in pregnancy is actually being put into practice at the institutional level to promote exercise. Thus, although the majority of doctors that I spoke with were not informed of (or

resisted) the notion that pregnant women should be 'fit for two,' it appears that there is a movement occurring to establish this as 'fact' in the medical community with the aim to "get them moving." It appears that this may not be an isolated example as the doctor also indicated that HMO's (Health Maintenance Organizations) in the United States are "starting to realize that there is a benefit to prenatal fitness." This move by HMOs, which are powerful insurance institutions that underpin the privatized US healthcare system, suggests that pressure for women to be 'fit for two' will become integrated into the national healthcare apparatus of the US, with the underlying neo-liberal goal of decreasing health care costs by having individuals engage in healthy-promoting activities. [229]

Adding to this, in the course of my interviews, a few of the doctors explained that the province of British Columbia recently updated their standard prenatal forms. For the first time, they have a 'check box' for physical activity (as opposed to just the category of 'stop work date'). While exercise is, of course, just a 'tick in the box' (as one physician observed), the inclusion of physical activity in the prenatal forms indicates that the shift in medical views concerning the importance of exercise during pregnancy is being implemented at the organizational level, added to the existing apparatus of governance.

Perhaps adding 'physical activity' will play out in lives of women as physicians feel compelled to spend more time discussing it with their patients – or perhaps physicians have too many other issues to address and will resist integrating this risk

[229] The increased interest by HMOs in exercise during pregnancy is in line with the new joint initiative called "Exercise is Medicine" that was launched by the ACSM and AMA in 2007. This program is designed to encourage "America's patients to incorporate physical activity and exercise into their daily routine" and calls on doctors to prescribe exercise to their patients (based on finding that four out of ten docs talk to patients about importance of exercise but don't always provide specifics) (ACSM, Nov. 5, 2007).

technology into their prenatal teachings. According to the majority of physicians that I interviewed, the latter is currently the case. While many encourage women to exercise during pregnancy, the issue is not "high on the radar" in the overall scope of prenatal care and as such, physicians do not appear to play a central role in instilling the notion that the pregnant woman should be 'fit for two' by exercising during pregnancy.

Weight(y) Matters?

While it appears that the majority of physicians do not pressure women to engage in exercise during pregnancy to be 'fit for two' it may be that as societal concerns around obesity (and especially maternal weight gain) increase, there will be growing emphasis on exercise as an important technique to help produce a future generation with decreased risk of chronic illness, thus reducing health care costs. Several physicians indicated that they had recently become aware of research regarding the dangers of excess weight gain during pregnancy (i.e., that it is a risk factor for GDM and caesarian sections) and that they were reconsidering their approach to how much a women should gain and how to address the issue with patients:

> **Dr:** ...like the average weight gain in pregnancy, um, ideal used to be uh, 25-35 pounds. And if a woman gained 40 pounds or 45 pounds, what I used to say to women was "Well, you know what? There's nothing dangerous about this. This is more work for you to get rid of after the pregnancy. But I personally am not going to be on your case for gaining 45 pounds in pregnancy because I have no evidence that that's deleterious to you or your pregnancy". But recently I read something that said well, that wasn't quite true. There was an increased risk of gestational diabetes. Um, and uh, and poor labour and delivery outcomes. Less successful spontaneous vaginal deliveries. Now that's just one little article. So I don't have, I don't think that's generally accepted. Um, but that made me think that well maybe I shouldn't be so conservative about ignoring women who are gaining 45 pounds of weight.
> **Interviewer:** Right
> **Dr:** You know, that's a tricky thing when you're looking after pregnant women. It's, it's, I don't want to be anyone's police about weight gain. (*Female OB-Gyn, 25 years*)

This physician is obviously concerned with the emotional impact that her consternation over weight gain might have on her patients and is currently weighing this against the scientific evidence regarding the risks of excess weight gain during pregnancy. Another female physician expressed a similar dilemma. Her comments are particularly striking as she emphasized throughout interviews that she takes a women-centred approach, discussing options and letting women decide what's best for them:

> But I've been thinking that maybe I should try to be a little more um, > vocal in my advice. Like, not >> shake a finger at the women, telling them they've gained too much weight, but maybe start to tell people about the situation and the increased chance of a Caesarian. I don't know. You know, I don't want to contribute to people's eating issues and body issues, so I hadn't yet sorted that out myself because in the years that I've been leaning towards a much more women's centred approach, I've stepped back from making comments about eating. (*Female GP, 30 years*)

The doctor who has written the book on exercise during pregnancy and is very much aware of the 'fit for two' literature emerging in the scientific community was more outspoken in her approach:

> So I think we have to scale back what's acceptable [for maternal weight gain]. Again, I'm very skewed. I can't tell you the last time somebody gained 40 pounds in my office through their entire pregnancy but *I will jump all over them* if I see – and it's not because I care how much they weigh, it's because this is not healthy. (*Female GP, 19 years*)

It may well be that the rather forceful approach demonstrated by this physician will become more commonplace as scientific studies regarding the dangers of obesity/overweight in pregnancy increase. In this context, exercise during pregnancy will take on new importance in the realm of prenatal care and may well be reflected in doctor-patient interactions and government health promotion messages.

While a debate about the validity of scientific literature linking obesity with ill health and/or with negative pregnancy outcomes (including birth defects) is beyond the

scope of this project, my aim is to point that we must be aware that as (if) this is accepted as 'truth,' it will be put to use in the regulation of the pregnant body. The possibility of such a development necessitates an awareness of how such discourses may impact the lives of pregnant women who are already under immense social pressure to engage in an ever-expanding list of pregnancy-related risks. Results from the physician interviews are promising, however, because many of the doctors appear to be empathetic to the difficulties that pregnant women face in their lives and the various barriers to engaging in exercise.

Conclusion

For the most part, the physicians that I spoke with did not appear to be overly concerned with regulating and/or (unnecessarily) limiting the exercise practices of pregnant women. Indeed, on the hierarchy of pregnancy-related risks, the majority of these physicians did not rank physical activity as high. Most did not perceive exercise to be dangerous for women with a healthy pregnancy (as long as they 'listen to their bodies') and the imperative to be 'fit for two' through the technique of physical activity during pregnancy was not a dominant discourse to arise. Prenatal exercise was typically viewed as one small piece of the prenatal care programme and not a crucial one at that. Of course, a few of the doctors indicated that they do take a more central role in regulating the active pregnant body. One of the physicians emphasized the risks of exercise during pregnancy and provided conservative advice (in a heavy-handed manner) while a few others emphasized the risks of *not* engaging in prenatal exercise and explained that they strongly encourage their patients to do so.

The physician interviews point to the complexity of messages regarding the safe limits of prenatal exercise that are circulating in the medical realm. Although a few of the interview participants were aware of the scientific literature and guidelines put forth by medical organizations, most based their advice on their clinical experiences or their 'common sense.' The result is a lack of standardized guidelines and advice ranging from a vague 'listen to your body' to strict prescriptions for rest (with feet elevated) three times per day. The diversity of messages from the medical profession then intermingle with knowledge put forth by medical organizations, messages in the mass media, advice from family and friends and ideas circulating in popular culture more generally. The result is a confusing mix of 'truth' claims that are likely taken up in differing ways by women of differing social location.

The interviews suggest that there remains a need to remind (or inform) some doctors that physical activity (even rigorous activity) is safe for women with healthy pregnancies – and that women's own bodily experiences during exercise should indeed be used as a gauge. Moreover, as awareness that prenatal exercise is an important way to prevent the maternal fetal diseases of pregnancy increases, it will be beneficial to sensitize physicians on how to approach the issue. Based on the interviews, it seems that many of the doctors empathize with their pregnant patients and are not intent on inducing guilt or putting pressure on them. That said, none of the doctors mentioned socio-economic constraints as a possible barrier to prenatal exercise.

Finally, this research calls into question the extent to which physicians may be considered 'experts' on the topic of prenatal exercise. Over the past few decades, exercise during pregnancy has emerged as a specialty area of exercise physiology as well as

obstetric care, with a proliferation of studies, medical guidelines and position statements. Yet many of the interview participants were largely unaware of this literature. In fact, a few physicians openly acknowledged their lack of expertise in the area and asked me for information on the topic, perceiving that I am more of an expert on the topic than they. This lack of awareness is not necessarily a symptom of doctors' resistance to new information or evidence-based material on the subject but rather of the difficulty in keeping up with this data in an information-rich society.

Moreover, the majority of the physicians that I spoke with were open to women seeking knowledge about exercise from alternative sources, suggesting that they do not feel the need to be the 'expert' on the topic. Several of the physicians recognized that women are entrepreneurial citizens who often seek out knowledge on their own, either from books, DVDs or fitness trainers. As one doctor explained:

> I find that most women will, you know, if they're going to a Fitness World or a Lady Fitness or wherever they're going to, will tend to, as issues come up, they tend to raise those with the fitness instructor or the staff of wherever they're going. So I guess I'm not getting as many, I'm not getting that many questions. You know, specifically as to what exercise. (*Male GP, 37 years*)

It appears that doctors have instead assumed a role in which they mostly provide general clearance for exercise based on their clinical examination of the patient (with one tool in this examination being the *PARmed-X* form which is presented to them by patients wishing to participate in prenatal exercise classes). When it comes to the specifics of prenatal exercise (what exercises to do, how much, how far), personal trainers and fitness instructors may be considered the new 'experts' as they are educated about the official guidelines, prenatal exercise screening forms and most recent studies (i.e., risk technologies) in their training courses. Following Lorentzen (2008), I suggest that the

power of the medical profession has been diffused because of the wider range of information available, the popular awareness of differences of expert opinion and the desire of the individual to take a more active participation in his/her self care (p. 55). Therefore, while the doctor interviews were interesting in many respects, it appears that new patterns of governance around exercise and pregnancy are emerging in which other body experts may play a more central role in the regulation of the pregnant body. This underscores that need to conduct further empirical research projects (such as speaking to fitness trainers as well as women) so that we can continue to map out the development of risk technologies and patterns of governance as they relate to prenatal exercise.

CHAPTER 9

Conclusion

This project was undertaken in response to the confusing mix of ideas and messages circulating about exercise and pregnancy in contemporary Western society that, in the current era of 'intensive motherhood,' have the potential to turn women's enjoyment of prenatal exercise into an experience shrouded in uncertainty and anxiety. My aim was to deconstruct some of the meanings that have been attached to the active pregnant body in order to draw attention to the contingencies of knowledge about maternal exercise at specific moments in time. For my investigation, I enlisted the analytical tool of 'governmentality' which helped me to examine the place of exercise during pregnancy within the larger apparatus of Western society over the past century. That is to say, I explored how exercise was fit into the governmental apparatus created to manage the risk of the pregnant body and the unborn child. This approach provided a key insight as to why the ideas and messages about physical activity and pregnancy are so messy and confusing: since the late nineteenth century, exercise during pregnancy has been framed as both a problem *and* a solution to the larger biopolitical aims of governance. In the late nineteenth century, for example, moderate exercise was viewed as a way to prepare the body for and ease the pain of childbirth, thus making it a strategy to encourage middle class white women to reproduce and fight 'race suicide.' At the same time, however, physicians warned that excessive exercise could drain women of their vital energy and produce a weakened child – or worse, result in a miscarriage. Exercise was thus positioned as a problem or a danger to the health of the race and strength of the nation-state, and women were advised to engage in only moderate, gender-appropriate

activities. A century later this double barreled situation remains: Long-standing cautions about the dangers of 'too vigorous' exercise persist (albeit less dominant than in the past) alongside the increasingly prominent view that exercise is an important way to reduce the chance of future chronic illness in a woman's offspring, turning it into a biopolitical strategy to reduce the costs of unhealthy bodies.

Through this discussion of the push and pull involved in the production of knowledge about exercise during pregnancy, one can see how maternal physical activity has been and remains about more than just sweat. It is inextricably tied to the political aims of governance, aims that themselves have changed from a concern with the collective strength of the nation-state to a (neo-liberal) concern with the costs of unhealthy bodies, further adding to the confusing mix of meanings attached to the active pregnant body. Moreover, in the past two decades, the apparatus surrounding exercise and pregnancy has expanded considerably, becoming more intricate, firmly embedded in women's everyday lives. Indeed, while exercise during pregnancy has been an object of medical attention since the nineteenth century, it now has a solid place in the larger medical complex. The rationalization of 'exercise and pregnancy science' over the past two decades, along with its debates concerning what counts as knowledge, shows how the active pregnant body has been wrapped in web of power relations that have produced contradictory discourses about what constitutes safe exercise. Simultaneously, an expanding pregnancy health and fitness industry has sprung up, disseminating medical advice about exercise during pregnancy and mobilizing a discourse of risk that is at once contradictory and in line with the aims of both industry (profit) and governance (the health and regulation of bodies). Importantly, the messages regarding physical activity

during pregnancy have been further confused by the fact that they are bound up in feminist issues regarding the freedom of the pregnant body and women's reproductive rights.

By situating maternal exercise within the larger governmental complex and closely examining the 'rules of formation' that allow particular statements (at certain times) to be accepted as 'truth' or 'knowledge' as well as showing how these 'truths' turn into a form of practicing power, my project illustrates the contingency of ideas regarding exercise and pregnancy. It demonstrates how exercise prescriptions are historical constructs. Knowledge shifts and changes, creating a potent mixture of statements and ideas, some of which count as 'truth' while others are dismissed, with this 'truth' status always open to contestation and change. My goal has been to open up an interdisciplinary dialogue between the fields of exercise science, obstetrics, sports medicine, social and cultural history, sociology and feminist studies, with the overall aim of troubling taken-for-granted ways of thinking about the active, pregnant body. Indeed, Pickett (2005) highlights the importance of engaging in genealogical examinations of the history of things that are not usually thought of as history. He explains that "once seen as the products of history that they are, and a contingent history at that, any sense of necessity or nature behind them is dispelled" (Pickett, 2005, p. 41). Their socially constructed nature becomes clear. In undertaking this project, my aim has not been to advocate 'new' and better knowledge or to tell pregnant women what to do. Rather my goal has been to use history "to introduce 'discontinuity into our very being' and thereby deprive us of the traditional grounds of 'reassuring stability' and its concomitant blindness" (Pickett, 2005, p. 42).

A stated aim of this project was to assess the usefulness of the work of Foucault in examining the production of knowledge about exercise during pregnancy with a feminist sensibility. His ideas have proven helpful in many respects, drawing attention to the importance of examining the rules of formation around what is accepted as truth and the contingency of this knowledge. Foucault's notion of power as circulating throughout society, disciplining individual bodies and regulating the social body has allowed for a complex and nuanced view of the interplay of medical knowledge and culture. In particular, the use of governmentality as an analytical tool has proven very useful to my project. Referring to the use of a governmental approach to examine reproductive issues, Weir (2006) asserts that:

> reconstructing the theoretical object as the 'government of pregnancy' in place of 'new reproductive technologies' leads to foregrounding the genealogical themes of risk, the conduct of conduct, liberalism and the liberal professions in relation to having children. Feminism is thereby moved away from an overconcentration on medical innovations and their supposedly invariant effects to placing more emphasis on the *means* by which the conduct of pregnancy is organized. (p. 375)

Similarly, the use of a governmental lens to view physical activity during pregnancy has allowed me to examine how medical knowledge about the body is deeply gendered and tied to a need to control the (female) body - but that instead of being rooted in a purely misogynistic agenda, such knowledge and ideas are bound up with the biopolitical aim of ensuring the conduct of conduct.

My genealogy of the governance of the active pregnant body also lent itself to a more detailed and nuanced account of the operation of risk in the governmental complex. Contrary to the manner in which risk is often paired with (and seen as equivalent to) neo-liberalism in the 'risk and governmentality' literature, through my examination I have illustrated how 'risk' in the context of exercise and pregnancy was in fact mobilized in

the welfare state – it had a place in the governance of bodies before the turn to neo-liberalism (albeit not as pronounced). Conversely, I found evidence to suggest that 'risk' is not necessarily ubiquitous in contemporary neo-liberal society, as some of the physicians that I spoke with resisted using risk discourse in dealing with their patients and, in fact, did not overtly frame their advice through a lens of medicine but instead simply told women to 'listen to their bodies.' Such findings underscore O'Malley's (2008) assertion that we must examine the heterogeneous nature of risk techniques (i.e., the diversity of risk techniques and the ways that they shift when attached to different governmental complexes) to avoid slipping into our own metanarratives of how risk operates as a governmental strategy. Along a similar vein, my research also illustrated how medicalized discourses of risk were mobilized within consumer culture (and paired with normative ideas around femininity) in order to urge women to be 'fit for two.' This project thus contributes to our understanding of how the consumer culture industry functions as part of the apparatus of governance while at same time making a profit – and the role of 'risk' in this equation.

Foucault's work has thus proven fruitful in many ways, but it does fall short in a number of respects. While he turned to 'technologies of the self' towards the end of his career in an attempt to better understand how individuals position themselves in relation to power (as opposed to merely being dominated by or the product of power), his writings are not particularly helpful for understanding how women might position themselves within and in relation to the discourses identified in my project. In this respect, one might look to the writings of feminist sociologist Dorothy Smith (1999) to further conceptualize the process by which women *act* in relation to discourse/knowledge. Smith takes up the

poststructuralist view that discourse speaks through us and beyond our intended meanings but sees people as *entering into* and *participating in* cultural texts. In her view, discourse is something that a woman *does* rather than something to which she is merely subjected (Mills, 2004). Smith suggests that we begin enquiry from the material, *lived experiences* and locations of women, and explore how these experiences are shaped by larger social practices and relations, thus providing insight into women's situated knowledges and facilitating an examination of the body as both structure *and* (lived) experience.

Foucault's ideas around resistance also require further comment. As I discussed in Chapter Five, while Foucault did not set out a clear strategy of resistance, his view of power as ubiquitous allows for multiple points of resistance since "where there is power, there is resistance" (Foucault, 1990, p. 95). I usefully took up his ideas around power and resistance (and combined them with Arney's (1982) articulation of social change as needing to occur on both the symbolic and material level) to examine resistance in the context of 'training for childbirth' and 'sporting moms.' What I would like to draw attention to here, however, is the critique that while Foucault may acknowledge resistance in his work, his rejection of a normative framework seems to negate the very *possibility* of resistance (see Best, 1997; Pickett, 2005). Elaborating on this point, Best (1997) notes that "every form of resistance, to be anything other than meaningless, must be founded on normative criteria, even if those criteria are only temporary, situational or strategic" (p. 25). According to Best, "by abandoning the notion of normative justification, Foucault can neither distinguish which instances of power involve domination and which do not, nor explain why, in a given circumstance, it may be preferable to resist domination than to submit to it" (p. 25). As a result, Foucault does not

articulate a way of resisting power's mechanisms as there are no margins outside the network of power.

Pickett (2005) takes a slightly different stance, arguing that Foucault did in fact elaborate a strategy with regard to how resistance functions as a counter to power, further suggesting that Foucault linked the practice of resistance to the practice of self-creation. "Refusing what we are is an important element of group action of the sort Foucault applauds," notes Picket, continuing that "since the individual is the product of power, to resist requires us to 'deconstruct' what we are, to create something entirely different, to innovate" (p. 49). Notably, this innovation requires resistances that do not contain limits – that completely dismiss a normative framework. As Pickett explains:

> If we are the products of modern power, then all of our behaviours, gestures, and thoughts, including our normative intuitions, are expressive of that power. If we draw upon our norms and moral codes to place limits upon what forms resistance and self-creation can take, we will actually be entrapping ourselves in the very system we are trying to escape because it will be rebellion in the name of the ideals drawn from modern power...yet if we do not draw upon our morals to guide this activity, there are no limits placed upon what we can do, and Foucault's position thereby sanctions the worst forms of engagement, such as [terrorism]. We either remain trapped in modern power, or we celebrate a resistance without limits. (pp. 49-50)

This leads us into a double bind whereby to truly resist, one must dismiss all of one's moral trappings as they are rooted in ideals drawn from modern power. Indeed, in the context of pregnancy and athletics, one can see that the ultimate resistance might be pregnancy doping – the act of purposely becoming pregnant and then aborting the fetus with the understanding that the hormones produced in the first few months of gestation will naturally improve an athlete's performance. This act symbolizes a dismissal of the ethics of motherhood, the moral code that typically puts one's baby first – interestingly, Eastern European athletes were accused of this practice in the Cold War years (Jarvis,

2003) further vilifying them in the eyes of Western society. Another act of 'true' resistance might entail a woman completely disregarding the heath of the fetus when exercising, focusing only on her own performance. These are both difficult versions of contestation to advocate, but according to Pickett, Foucault's writings leave us in a position of either being trapped in modern power or celebrating resistance without limits.

Thus, if one is seeking an articulation of complete resistance in the work of Foucault (one that does not entail dire or violent means), he or she will be at a loss. In a Foucauldian view, power relations are always present and cannot be escaped. However, this does not mean that individuals cannot resist in reaction to certain situations or 'intolerables,' rather that we will never truly be out of the grip of power relations.[230] Power relations are constantly shifting and changing and can work in ways that are unanticipated which means that one must always be aware of and (re)assess one's position. Moreover, to use the work of Foucault, one does not have to reject a normative framework. Indeed, adhering to his ideas in a dogmatic manner is exactly what Foucault protested against. Mills (2004) reminds us that Foucault's work is not a system of ideas nor a general theory and as he himself says, "All my books...are little tool boxes...if people want to open them, to use this sentence or that idea as a screwdriver or spanner to short-circuit, discredit or smash systems of power, including eventually those from which my books have emerged...so much the better'" (cited in Mills, 2004, p. 15). With respect to the issue of resistance, one might look to the work of Best (1997) to complement the ideas of Foucault. Best suggests that:

> theories of oppositional practice within popular culture must be constructed situationally. The specific dimensions of either a form or theory of resistance will

[230] Foucault saw the use of genealogical analysis as being one way to 'recapture' subjugated knowledge that could then find expression in collective action (see Pickett, 2005, p. 46).

> depend on the nature of the particular struggle in question. And because theorizing popular culture cannot be done 'once and for all' and requires a persistent effort, resistance must be theorized strategically; as something which might be effective in one instance and not in another. (p. 24)

It also means, asserts Best, that one must take the risk of developing an evaluative paradigm or normative framework, even if only temporary and negotiated (thus abandoning a quest for 'pure' coherent positions in theory and practice). Best directs us to the work of Gayatri Spivak who asserts that "positioning oneself strategically in order to achieve the theoretical or practical advantage for the moment does not necessarily entail pledging allegiance to that position" (cited in Best, p. 24). A position can be taken to obtain a goal and then reassessed, dismissed, renegotiated.

Future Directions

While providing interesting insights into the production of Western medical knowledge about exercise during pregnancy, there remains a compelling need to examine physical activity and pregnancy in other cultural contexts. Indeed, Western medicine subscribes to ideas regarding the body, health and pregnancy that differ substantially from understandings in other cultural contexts. Chinese medicine, for instance, deeply rooted in Confucian traditions, views reproductive health as a dynamic balance between the various forces of yin and yang, marked by free and unimpeded energy flow (Furth, 1987). Imbalance or disorder results from excess or deficiency, and balance is a matter of constant adjustment so that "health requires constant vigilance in harmonizing every aspect of regimen and conduct, encompassing the control of one's environment and the management of one's emotions, while the onset of disease can be insidious" (p. 13). This view of the physiology of pregnancy differs dramatically from Western medical

conceptualizations, suggesting that notions of exercise during pregnancy likely also vary and require closer examination.[231]

Aboriginal birthing traditions in Canada also differ from biomedical birthing procedures, as oral histories suggest that Aboriginal peoples viewed childbirth as integral to other natural and creative life processes and as an extended family/community process rather than as a medical event or purely a 'woman's experience' (Carroll & Benoit, 2004; Ford & Van Wagner, 2004). According to Jasen (1997), Aboriginal women in northern Canada traditionally sought to minimize the pain and peril of childbirth through attention to diet and ritual observances, typically laboured and delivered in a kneeling position (often with a horizontal pole or rope to grasp in front) and included the use of herbs to treat various conditions before, during and after childbirth. Thus, even though practices varied according to region and circumstances, the culture of childbirth among Aboriginal women was very different from the Western biomedical model. After a period in which the federal government imposed Western birthing practices upon Aboriginal women, government legislation is now being applied to help revitalize Aboriginal midwifery practices in Canada.[232] The re-emergence of traditional midwifery practices, note Carroll and Benoit (2004), has led to attempts to merge ancient healing practices and medical science in order to create "an alternative model of midwifery care that meets the unique needs of the Aboriginal community" (p. 264).

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[231] Furth (1987) notes that reproductive medicine of the seventeenth to nineteenth century "offered a dual model of Confucian gender relations" (p. 9). On the one hand, she notes, "women were the sickly sex, physical weaklings benignly dependent in a paternalistic social order; on the other they were sources of the destructive emotions and pollution that kills babies, emblematic of their capacity to disrupt the family" (p. 9).

[232] A federal government policy was initiated in the early 1970s which mandated evacuation of all pregnant women from remote communities to urban hospitals, a reaction to high rates of infant morbidity and mortality (Ford & Van Wagner, 2004).

Given the multicultural nature of Canadian society and the apparent blending of different perceptions and understandings of the body and health described above, it is clearly important to move beyond a Eurocentric examination of ideas regarding exercise and pregnancy. The dangers of overweight and obesity during pregnancy, in particular, emerged as an important issue in my project, suggesting a need to further examine medical knowledge about healthy body weights and physical activity (in differing cultural contexts). Significantly, it is Aboriginal women in Canada who have been identified as most 'at risk' of the 'maternal-fetal diseases' of diabetes and obesity such that an exploration of the production of biomedical knowledge as well as Aboriginal medical knowledge on the issue is of importance. My research might therefore be viewed as a first step towards a wider, more culturally aware investigation of exercise and pregnancy which would examine the rules of formation and ways of knowing in other cultural settings.

In addition to expanding my research agenda to an examination of other cultural groups and ways of knowing about the body, there remains a need to further explore exercise and pregnancy in the context of Western medicine. Additional enquiry into the Canadian guidelines for prenatal exercise (i.e., the joint SOGC/CSEP clinical practice guidelines) is required to further elucidate key issues associated with their production, as well as how these guidelines bring together disciplinary and juridical forms of power. That is, to examine the extent to which health care professionals decide to 'enforce' the knowledge put forth in the guidelines (disciplinary tools) out of concerns about the legal risks of not doing so (i.e., punitive measures).

Moreover, my brief excursion into the natural childbirth/training for childbirth literature revealed a huge area awaiting further investigation, including a critical analysis of the early stages of the natural childbirth movement in Canada (or those who openly advocated 'training for childbirth'). Moreover, further exploration of whether a prenatal gymnastics/physical culture movement existed in Canada – and its links to the natural childbirth movement - would be an interesting avenue to pursue.

Finally, the focus of this project has been on the production and circulation of discourse regarding exercise during pregnancy, with a particular emphasis on the discourse of risk and its role as a tool of governance. The next step is to explore how pregnant women from different cultural and social backgrounds understand the role of physical activity and healthy body weights. In other words, I would like to move from a sole focus on 'body as representation' to an exploration of the 'body as lived experience,' allowing for an examination of the paradox of the body as both object and subject (see Rail & Dumas, 2008). Findings from such a study could be shared with health care providers at community presentations in order to promote more positive patient-caregiver interactions, and might also facilitate the creation of more inclusive health promotion programmes and messages, with the goal of increasing women's health and promoting pleasurable physical activity during pregnancy, as well as at any other time.

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Williams, S., & Bendelow, G. (1998). *The lived body: Sociological themes, embodied issues*. New York: Routledge.

Wirth, V., Emmons, P., & Larson, D. (1978). *Runner's World* special report (Part one): Running through pregnancy. *Runner's World*, 13(11), 54-59.

Wolfe, L.A., Hall, P., Webb, K.A., Goodman, L., Monga, M., & McGrath, M.J. (1989a). Prescription of aerobic exercise during pregnancy. *Sports Medicine*, 8(5), 273-301.

Wolfe, L.A., Ohtake, P.J., Mottola, M.F., & McGrath, M.J. (1989b). Physiological interactions between pregnancy and aerobic exercise. *Exercise and Sport Sciences Reviews*, 17, 295-351.

Wolfe, L., & Mottola, M. (1993). Aerobic exercise in pregnancy: An update. *Canadian Journal of Applied Physiology*, 18(2), 119-147.

Wolfe, L., Brenner, I., & Mottala, M. (1994). Maternal exercise, fetal well-being and pregnancy outcome. In J. Holloszy (Ed.), *Exercise and sport sciences reviews (volume 22)* (pp. 145-194). Baltimore: Williams & Wilkins.

Wolfe, L., & Davies, G. (2003). Canadian guidelines for exercise in pregnancy. *Clinical Obstetrics and Gynecology*, 46(2), 488-495.

Women in industry. (1919). *The Lancet*, Volume 2(July 26), 167-169 & 213-215.

Women motorists. (1913). *JAMA*, 60(8), 597-598.

Wright, E. (1966). *The new childbirth*. New York: Hart Publishing Company, Inc.

Wright, J., Rail, G., MacDonald, D., MacNeill, M., & Evans, J. (2006). *Bio-pedagogies: Schooling, youth, the body and the "obesity epidemic." Grant proposal for the* International Studies and Alliances Committee, University of Wollongong. Wollongong, Australia: University of Wollongong.

Wycoff, A. (February/March 2005). Due process. *Fit Pregnancy*, 11(6), 60.

Wycoff, A. (February /March 2004). Model of fitness. *Fit Pregnancy*, 10(6), 36.

Wycoff, A. (June/July 2004). Olympic mom. *Fit Pregnancy*, 11(2), 68.

Young, J. (1940). Relaxation of the pelvic joints in pregnancy: Pelvic anthropathy of pregnancy. *The Journal of Obstetrics & Gynaecology of the British Empire*, 47(5), 493-524.

Zaharieva, E. (1965). Survey of sportswomen at the Tokyo Olympics. *The Journal of Sports Medicine and Physical Fitness*, 5(4), 215-219.

Zaharieva, E. (1972). Olympic participation by women: Effects on pregnancy and childbirth. *Journal of the American Medical Association*, 221(9), 992-995.

Zola, I. (1972). Medicine as an instrument of social control. *Sociological Review*, 20, 487-504.

APPENDIX A

Index Medicus Search Terms

Index Medicus (1903-1920) (Series 2)

- In the first half of the series, I looked under the following headings which were listed monthly: "gynecology" (subheadings: 'general' and 'disorders of menstruation'); "obstetrics" (subheadings: 'general' and 'pregnancy and complications'); "hygiene." The format of the index changed in the latter half of the series with articles being listed under a 'subject index.' I therefore examined the subject index (for each month) under the headings of: "athletics"; "exercise"; "training"; "pregnancy" (subheading: 'hygiene'); "women" (subheadings: 'hygiene,' 'occupations').

Index Medicus (1921-1926) (Series 3)

- For each year, I searched the list of articles grouped under the following keywords: "exercise"; "gymnastics"; "gynecology"; "hygiene"; "labor"; "maternity"; "menstruation"; "obstetrics"; "physiotherapy"; "pregnancy"; "training"; "women"; "work."

Quarterly Cumulative Index Medicus (1927-1956) (Series 4)

- I searched the list of articles grouped under the following keywords (there are two indexes per year in this series): "athletics"; "exercise"; "industry & occupations" (subheadings: 'hygiene' and 'injuries'); "maternal" (subheading: 'welfare'); "physical education & training"; "pregnancy" (subheadings: 'diet', 'hemorrhage,' 'hygiene,' 'weight in'); "women."

APPENDIX B

Explanation of Data Collection: Scientific Articles (1950 - Present)

For my search of articles published between 1950 and 1979, I used the search terms 'sport and pregnancy' and 'pregnancy and exercise'. The search yielded 28 articles that I identified as relevant as they clearly focused on aerobic exercise during pregnancy (see Appendix B1 for a list of articles reviewed).[233] For my search of articles published between 1980 and 1990, I used the search term 'pregnancy and exercise' and identified 141 articles that had a clear focus on aerobic exercise during pregnancy. Of these 141, I looked at the articles that provided 'reviews' of the literature, as well as several of the studies that were repeatedly referred to in these review articles as being 'landmark' or 'key' studies (typically published in the *American Journal of Obstetrics and Gynecology*) (see Appendix B2).

From 1990 to present there was a dramatic increase in articles published on exercise and pregnancy, and so I focused on the review articles, as well as ones that seemed to advocate one extreme or the other (i.e., pushing the limits or more conservative). In addition, I flagged articles that discussed and/or critiqued the validity of guidelines for prenatal exercise, as they provided insight into the formulation of guidelines, as well as the tensions and debates within the scientific community concerning the 'official' recommendations. I also examined articles or papers published by key medical organizations which outlined prescriptions or official guidelines for exercise during pregnancy. This included all three sets of guidelines released by the ACOG (1985; 1994; 2002), the American College of Sports Medicine (ACSM) position

[233] This search yielded 8 articles pertaining to antenatal or 'training for childbirth' exercises although I did not examine many of these as my interest was in aerobic exercise.

statement (2000); the joint Society of Obstetricians and Gynecologists of Canada & Canadian Society for Exercise Physiology (SOGC/CSEP) guidelines (2003) and the Canadian Academy of Sports Medicine (CASM) position statement (1998; 2008). I also looked at the articles on exercise and pregnancy published in the *Exercise and Sport Sciences Reviews* (Wolfe, L., Brenner, I., & Mottola, M., 1994; Wolfe, L., Ohtake, P., Mottola, M., McGrath, M., 1989). This journal is an official journal of the ACSM and is typically called 'The Redbook'. According to Ulrich's Periodicals Dictionary (www.ulrichsweb.com), *Exercise and Sport Sciences Reviews* "includes brief reviews for readers with a broad interest in scientific issues related to exercise, movement, physical activity and/or sport." I reviewed roughly sixty articles published between 1991 and present.

APPENDIX B1

Results from PubMed Search (1950-1979)

Key words: "Sports and Pregnancy"; "Exercise and Pregnancy"
Search Conducted: February 2, 2008
** Presented in order of date published

Bader R.A., Bader, M.E., Rose, D.F., & Braunwald, E. (1955). Hemodynamics at rest and during exercise in normal pregnancy as studies by cardiac catheterization. *Journal of Clinical Investigation*, 34(10), 1524-36.

Hart, A., Morris, N., Osborn, S.B., Wright, H.P. (1956). Effective uterine bloodflow during exercise in normal and pre-eclamptic pregnancies. *Lancet*, 271(6941), 481-4.

Ryde, D. (1956). The effects of strenuous exertion on women. *Practitioner*, 177(1057), 73-7.

Jokl, E. (1979, original published 1957). The athletic status of women: An analysis of a social phenomenon. *American Corrective Therapy Journal*, 33(4), 103-10. (Reprinted from *The British Journal of Physical Medicine*)

Hon, E.H., & Wohlgemuth, R. (1961). The electronic evaluation of fetal heart rate. IV. The effect of maternal exercise. *American Journal of Obstetrics & Gynecology*, 81, 361-71.

Gendel, E.S. (1967). Pregnancy, fitness, and sports. *JAMA*, 201(10), 751-4.

Seitchik, J. (1967). Body composition and energy expenditure during rest and work in pregnancy. *American Journal of Obstetrics & Gynecology*, 97(5), 701-713.

Bruser, M. (1968). Sporting activities during pregnancy. *Obstetrics and Gynecology*, 32(5), 721-5.

Ueland, K., Novy, M.J., Peterson, E.N., & Metcalfe, J. (1969). Maternal cardiovascular dynamics. IV. The influence of gestational age on the maternal cardiovascular response to posture and exercise. *American Journal of Obstetrics & Gynecology*, 104(6), 856-64.

Guzman, C.A., & Caplan, R. (1970). Cardiorespiratory response to exercise during pregnancy. *American Journal of Obstetrics & Gynecology*, 108(4), 600-5.

Morton, D. (1970). Gynaecological complications of water skiing. *Medical Journal of Australia*, 1(25), 1256-7.

Emmanouilides, G.C., Hobel, C.J., & Yashiro, K., & Klyman, G. (1972). Fetal responses to maternal exercise in the sheep. *American Journal of Obstetrics & Gynecology*, 112(1), 130-7.

Meckelnburg, R.L. (1972). To dive or not to dive. *Delaware Medical Journal*, 44(3), 91-2.

Ueland, K., Novy, M.J., & Metcalfe, J. (1972). Hemodynamic responses of patients with heart disease to pregnancy and exercise. *American Journal of Obstetrics & Gynecology*, 113(1), 47-59.

Zaharieva, E. (1972). Olympic participation by women. Effects on pregnancy and childbirth. *JAMA*, 221(9), 992-5.

Crawford, J.S. (1973). Letter: Weight-lifters and women in labour. *Lancet*, 2(7842), 1383.

Harris, D.V. (1973). Women in sports: some misconceptions. *Journal of Sports Medicine*, 1(3), 15-7.

Ueland, K., Novy, M.J., & Metcalfe, J. (1973). Cardiorespiratory responses to pregnancy and exercise in normal women and patients with heart disease. *American Journal of Obstetrics & Gynecology,* 115(1), 4-10.

Knuttgen, H.G., & Emerson. K., Jr. (1974). Physiological response to pregnancy at rest and during exercise. *Journal of Applied Physiology*, 36(5), 549-53.

Pomerance, J.J., Gluck, L., & Lynch, V.A. (1974). Maternal exercise as a screening test for uteroplacental insufficiency. *Obstetrics and Gynecology*, 44(3), 383-7.

Pomerance, J.J., Gluck, L., & Lynch. (1974). Physical fitness in pregnancy: Its effect on pregnancy outcome. *American Journal of Obstetrics & Gynecology*, 119(7), 867-76.

Pernoll, M.L., Metcalfe, J., Kovach, P.A., Wachtel, R., & Dunham, M.J. (1975). Ventilation during rest and exercise in pregnancy and postpartum. *Respiratory Physiology*, 25(3), 295-310.

Pernoll, M.L., Metcalfe, J., Schlenker, T.L., Welch, J.E., & Matsumoto, J.A. (1975). Oxygen consumption at rest and during exercise in pregnancy. *Respiratory Physiology*, 25(3), 285-93.

Curet, L.B., Orr, J.A., Rankin, H.G., & Ungerer, T. (1976). Effect of exercise on cardiac output and distribution of uterine blood flow in pregnant ewes. *Journal of Applied Physiology,* 40(5),725-8.

Schaefer, C.F. (1979). Possible teratogenic hyperthermia and marathon running. *JAMA*, 241(18), 1892.

APPENDIX B2

Results from PubMed Search (1980-1990)

Key words: "Sports and Pregnancy", "Exercise and Pregnancy"
Search Conducted: March 4, 2008
** Presented in order of date published

Orselli, R.C. (1980). Possible teratogenic hyperthermia and marathon running. *JAMA*, 243(4). 332.

Korcok, M. (1981). Pregnant jogger: What a record! *JAMA*, 246(3), 201.

Sibley, L., Ruhling, R.O., Cameron-Foster, J., Christensen, C., & Bolen, T. (1981). Swimming and physical fitness during pregnancy. *Journal of Nurse Midwifery*, 26(6), 3-12.

Dale, E., Mullinax, K.M., & Bryan, D.H. (1982). Exercise during pregnancy: Effects on the fetus. *Canadian Journal of Applied Sport Sciences*, 7(2), 98-103.

Bagnall, K.M., Mottola, M.F., & McFadden, K.D. (1983). The effects of strenuous exercise on maternal rats and their developing fetuses. *Canadian Journal of Applied Sport Sciences*, 8(4), 254-9.

Kolata G. (1983). Exercise During Pregnancy Reassessed. *Science*, 219(4586), 832-833.

Clapp, J., & Dickstein, S. (1984). Endurance exercise and pregnancy outcome. *Medicine and Science in Sports and Exercise*, 16(6), 556-62.

Diddle, A.W. (1984). Interrelationship of pregnancy and athletic performance. *Journal of the Tennessee Medical Association*, 77(5), 265-9.

Lotgering, F.K., Gilbert, R.D., & Longo, L.D. (1984). The interactions of exercise and pregnancy: A review. *American Journal of Obstetrics & Gynecology*, 149(5), 560-8.

Lotgering, F.K., & Longo, L.D. (1984). Exercise and pregnancy: How much is too much? *Contemporary Ob/Gyn*. 23, 63-77.

Snyder, D.K., & Carruth, B.R. (1984). Current controversies: Exercising during pregnancy. *Journal of Adolescent Health Care*, 5(1), 34-6.

Gorski, J. (1985). Exercise during pregnancy: Maternal and fetal responses, a brief review. *Medicine and Science in Sports and Exercise*, 17(4), 407-16.

Lotgering, F.K., Gilbert, R.D., & Longo, L.D. (1985). Maternal and fetal responses to exercise during pregnancy. *Physiological Reviews*, 65(1), 1-36.

Lutter, J.M. (1985). Health concerns of women runners. *Clinical Sports Me*dicine, 4(4), 671-684.

Maeder, E.C. (1985). Effects of sports and exercise in pregnancy: With guidelines for patients. *Postgraduate Medicine*, 77(2), 112, 114.

Morton, M.J., Paul, M.S., & Metcalfe, J. (1985). Exercise during pregnancy. *Medical Clinics of North America*, 69(1), 97-108.

Gauthier, M. (1986). Guidelines for exercise during pregnancy: Too little or too much? *The Physician and Sportsmedicine*, 14(4), 162- 69.

Mullinax, K.M., & Dale, E. (1986). Some considerations of exercise during pregnancy. *Clinical Sports Medicine*. 5(3), 559-70.

Hall, D.C., & Kaufmann, D.A. (1987). Effects of aerobic and strength conditioning on pregnancy outcomes. *American Journal of Obstetrics & Gynecology*, 157(5), 1199-1203.

Kulpa, P.J., White, B.M., & Visscher, R. (1987). Aerobic exercise in pregnancy. *American Journal of Obstetrics & Gynecology,* 156(6), 1395-403.

Paolone, A.M., Shangold, M., Paul, D., Minnitti, J., & Weiner, S. (1987). Fetal heart rate measurement during maternal exercise--avoidance of artifact. *Medicine and Science in Sports and Exercise*, 19(6), 605-9.

Wallace, A.M., & Engstrom, J.L. (1987). The effects of aerobic exercise on the pregnant woman, fetus, and pregnancy outcome: A review. *Journal of Nurse Midwifery*, 32(5), 277-90.

Paisley, J., & Mellion, M. (1988). Exercise during pregnancy. *American Family Physician*, 38(5), 143-150.

Leaf, D.A. (1989). Exercise during pregnancy: Guidelines and controversies. *Postgraduate Medicine*, 85(1), 233-4, 237-8.

Sady, S.P., & Carpenter, M.W. (1989). Aerobic exercise during pregnancy: Special considerations. *Sports Medicine*, 7(6), 357-75.

Wolfe, L.A., Ohtake, P.J., Mottola, M.F., & McGrath, M.J. (1989). Physiological interactions between pregnancy and aerobic exercise. *Exercise and Sport Sciences Reviews*, 17, 295-351.

Wolfe, L.A., Hall, P., Webb, K.A., Goodman, L., Monga, M., & McGrath, M.J. (1989). Prescription of aerobic exercise during pregnancy. *Sports Medicine*, 8(5), 273-301.

Fishbein, E.G, & Phillips, M. (1990). How safe is exercise during pregnancy? *Journal of Obstetrics, Gynecology and Neonatal Nursing,* 19(1), 45-9.

Huch, R., & Erkkola, R. (1990). Pregnancy and exercise -- exercise and pregnancy: A short review. *British Journal of Obstetrics and Gynaecology,* 97(3), 208-14.

Jarski, R.W., & Trippett, D.L. (1990). The risks and benefits of exercise during pregnancy. *Journal of the Family Practitioner*, 30(6), 717.

Snyder, J.L. (1990). Aerobic exercise during pregnancy. *Journal of the American Board of Family Practice*, 3(1), 50-3.

APPENDIX C

Results from Readers' Abstract Retrospective Search (1890-1982)

Key words: "Sports and Pregnancy"; "Exercise and Pregnancy"; "Fitness and Pregnancy"; Physical Activity and Pregnancy"
Search Conducted: April 14, 2008
** Presented in order of date published

Sweeny, M. T. (September 1939). Your daily dozen during pregnancy. *Hygeia,* 17, 795-8.

Bertram, C. M. (July 1975). Exercise for pregnant women. *Harper's Bazaar*, 108, 49.

Prudden, S., & Sussman, J. (April 1978). How to exercise throughout your pregnancy. *Glamour*, 76, 198 & 201.

Katch, F. I. (October 1978). Exercising for two. *Mademoiselle*, 84, 80.

Wirth, V., Emmons, P., & Larson, D. (1978). Running through pregnancy: Not only is it safe, it may save your life. *Runner's World*, 13(11), 55-59.

Kelly, J., Leavy, J., & Northup, A. (July 1978). Who says athletes can't be pregnant? *Ms.*, 7(1), 47-48.

Leavy, J. (July 1978). Evonne Goolagong: Playing winning tennis again. *Ms*, 7(1). 49-51.

For a graceful pregnancy. (February 1979). *McCall's*, 106, 40.

Williams, M. S. (July 1979). Fitness for mothers-to-be. *McCall's*, 106, 53.

Exercises that meet your body's changing needs. (October 1979). *Glamour*, 77, 296.

Exercises that meet your body's changing needs. (July 1980). *Glamour*, 78, 121.

Exploding female fitness myths (December 1980). *Chatelaine*, 53(12), 32 & 34.

Jane Fonda's pregnancy exercises. (September 1981). *Redbook*, 157, 110.

Panter, G. G. (September 1981). Sports and exercise in pregnancy. *Parents*, 56, 93-4.

Gordon, L. (1982). Everything you need to know about spots and menstruation, contraception, fertility, pregnancy. *Glamour*, 80, 115-116.

Shangold, M. (1982). Women's Running. *Runner's World*, 17(11), 18.

What to do when you're running for two? (1982). *Runner's World*, 17(7), 40.

APPENDIX D

Results from Readers' Guide Abstract Search (1983 – Present)

NOTE: Appendix D also includes additional articles collected from *Health* and *Prevention* (accessed through Academic Search Complete) and *Shape* and *Runner's World* (accessed through Canadian Reference Centre)

Key Words: "Exercise and Pregnancy"
Search Conducted: April - May, 2008
** Articles arranged by year (alphabetical order within each year).

Ball, A. L. (May 1983). The pregnancy workout. *Redbook*, 161, 90.

Bonavoglia, A. (May 1983). Is it safe to run while pregnant? A checklist for joggers. *Ms.*, 11, 69.

Cole, J., & Laibson, H. (February 1983). Exercise during pregnancy. *Parents*, 58, 39- 42.

Hart, J. (December 1983). Pregnant, fit, and happy! *Parents*, 58, 84-8.

Jane Fonda's workout for prenatal energy (July 1983), *Chatelaine*, 56(7), 29.

Kolata, G. (February 18, 1983). Exercise during pregnancy reassessed. *Science*, 219, 832-3.

Leaf, D., & Paul, M. (1983). Giving birth to a new theory. *Runner's World*, 18(7), 49-51 & 70.

10 keep-your-figure exercises. (May 1984). *Redbook*, 163, 98-101.

Carlson, R. (September 1984). Wading madonnas. *Health*, 16, 14.

Kaplan, J. (May 1984). Pregnancy and exercise. *Vogue*, 174, 126.

Keerdoja, E. (July 23, 1984). Now, the pregnancy workout. *Newsweek*, 104, 70.

Mantell, S. (June 1984). Fit to be pregnant. *Women's Sports & Fitness*, 6, 43-5.

Wiley, K. W. (October 1984). Pregnancy "training". *Vogue*, 174, 532.

Heinonen, J. (1985). Running for two. *Runner's World*, 20(9), 45-48 & 73-5.

Hillard, P. A. (February 1985). Exercise during pregnancy. *Parents*, 60, 126 & 128.

MacCallum, L. (March 1985). Special exercises for pregnancy. *Glamour*, 83, 262.

MacCallum, L. (August 1985). New--dos and don'ts for exercising safely. *Glamour*, 83, 184.

Mirkin, G. (1985). The pregnant runner. *Runner's World*, 20(6), 90.

Mosher, C. (November 1985). The maternal athlete. *Women's Sports & Fitness*, 7, 54-5.

Platt, H. (October 1985). Staying fit safely. *Harper's Bazaar*, 118, 238-239 & 289.

Pregnancy workout. (September 1985). *McCall's*, 112, 62.

Williams, M. S. (March 1985). Fat-busting myths about flabby mothers. *McCall's*, 112, 62.

Wilmore, J. H. (October 1985). Video fitness: what's hot, what's not. *Vogue*, 175, 499-500.

Burfoot, A. (1986). Using her women's intuition. *Runner's World*, 21(3), 30-36.

Cummings, S. (January 1986). The pregnant pause. *Health*, 18, 68-71.

Exercise during pregnancy. (1986). *Chatelaine*, 59(4), 32.

Fawcett, J. (June 1986). Pretty big: Body attitudes during pregnancy. *Health*, 18, 6.

Kort, M. (May 1986). Can maternity make you a better athlete? *Women's Sports & Fitness*, 8, 38-40.

Potera, C. (April 1986). Is pregnancy a good time to get fit? *Women's Sports & Fitness*, 8, 51.

Ullyot, J. (1986). And baby makes speed. *Runner's World*, 21(3), 38- 44 & 86.

Warning signal for exercise plans. (February 1986). *USA Today*, 114, 9-10.

Hanson, S. B. (February 1987). Fitness facts and fables. *McCall's*, 114, 76.

A pregnant caution. (August/September 1988). *Women's Sports & Fitness*, 10, 11-12.

Anderson, O. (December 1988). Is running during pregnancy safe? *Women's Sports & Fitness*, 10, 16-17.

Hutter, R. (March 1988).You two can stay in shape. *Health*, 20, 24.

Kaplan, J. (October 1988). Should pregnant women exercise? *Vogue*, 178, 348.

Kaufmann, E. (December 1988). The workout controversy. *American Health*, 7, 50.

MacCallum, L. (March 1988). Pregnancy exercises. *Glamour*, 86, 272.

Morgan, D. V. (November 1988). Lean and mean . . . then pregnant. *Health*, 20, 58-61.

Ullyot, J. (July 1988). Special delivery (running during and after pregnancy). *Runner's World*, 23, 20.

Davis, K. (June 1989). Pregnant and fit. *Women's Sports & Fitness*, 11, 50-5.

Seligmann, J. (December 11, 1989). Fitness boom vs. baby boom. *Newsweek*, 114, 79.

Kegel exercises: for all women [strengthening pelvic-floor muscles]. (March 1990). *McCall's*, 117, 38.

New trends in pregnancy care. (January 1990). *McCall's*, 117, 51.

Armstrong, P. (January/February 1991). Active birthing. *Women's Sports & Fitness*, 13, 14-15.

Atkins - Hessekiel, A. (June 1991). Fitness for two: The benefits of workouts for mothers-to-be. *Better Homes and Gardens*, 69, 53-4.

Cherry, S. H. (January 1991). Exercise during pregnancy. *Parents Magazine*, 66, 103-4.

Franklin, D., & Griffin, K. (October 1992). Diabetes in pregnancy? Pump iron, not insulin. *Health*, 6(6), 17.

Kaufmann, E. (September 1992). The pregnant pause: Must women athletes choose between fitness and pregnancy? *Women's Sports & Fitness*, 14, 40-2.

Brodey, D. (November 1993). Building bigger babies. *American Health*, 12, 88.

Buchanan, D. (September 1993). Running pregnant. *Runner's World*, 28, 34.

Franklin, D., & Fraser, L. (1993). Active moms, bigger babies. *Health*, 7(6), 16.

Menter, M. (November 1993). Beauty strategies for pregnant moms. *Redbook*, 182, 74.

Brody, J. E. (February 2 1994). Exercising safely during pregnancy. *New York Times*, p. C13.

Brody, J. E. (February 2 1994). Fitness and the fetus: A turnabout in advice. *New York Times*, p. C13.

Buxton, B. (1994). Prenatal exercise. *Chatelaine*, 67(11), 36.

Cadoff, J. (June 1994). Exercise during pregnancy. *Glamour*, 92, 212-15.

Beim, A. (July/August 1995). Exercise during pregnancy. *Health*, 14, 44.

Shangold, M. (1996). Help ahead: Running and pregnancy. *Runner's World*, 31(10), 44.

Shannon, J. (August 1996). Beat the heat. *Parents*, 71, 117-18.

Bean, A. (1997). Running mom = smart kid. *Runner's World*, 32(6), 28.

Densmore, L. F. (April 1997). You're fit, fast, toned, tough . . . & pregnant. *Women's Sports & Fitness*, 19, 52-5.

Gerszberg, C. O. (May 1997). Pregnancy workout. *Parents*, 72, 67-8.

Rosenblum, G. (March 1998). Have a safe pregnancy. *Parents*, 73(3), 92-4.

Bauman, A. (1999). Why moms should run. *Runner's World*, 34(7), 28.

Graves, G. (February 1999). Fit for two. *Parents*, 74(2), 107-8.

Williams, R. D. (March/April 1999). Healthy pregnancy, healthy baby. *FDA Consumer*, 33(2), 18-22.

Graham, J. (2000). A smart start. *Parents*, 75(9), 241-242.

Straley, C. (October 2001). I lost the baby weight! *Parents*, 76(10), 107-8.

Tupler, J., & Wood, S. (2001). Fit for delivery. *Baby Talk*, 66(5), 33-6.

Eck, B. (2002). Baby talk. *Runner's World*, 37(8), 20.

Minkin, M. J. (December 2002). Exercise for two: Baby and you. *Prevention*, 54(12), 101-2.

Stacey, M. (2002). Fear of pregnancy. *Shape*, 21(9), 94&96.

Can-do attitude sheds pounds (2003). *Shape*, 22(6), 66.

Grimm, D. (September 15, 2003). Ills From the womb. *U.S. News & World Report*, 135(8), 42-4.

Howard, B. (February 2003). 23 Ways to lose the baby weight. *Baby Talk*, 68(1), 56, 58, 60, 62.

In full bloom. (2003). *Shape*, 22(10), 114.

Reid-St. John, S. (November 2003). Sweat your way to a healthy pregnancy. *Health*, 17(9), 82.

Bollinger, C. (December 2004). Bye-bye baby fat. *Prevention*, 56(12), 111-13.

Bridson-Boyczuk, K. (April 2004). Mother knows best: Running while pregnant. *Runner's World*, 39(4), 55-6.

Reid-St. John, S. (June 2004). Walk off your baby weight. *Health*, 18(5), 97.

Shea, S. B. (April 2004). Walk off the baby weight. *Parents*, 79(4), 103-4, 106.

Siklos, L. (April 2004). Can you prevent a miscarriage? *Baby Talk*, 69(3), 82.

Steinmehl, E. (2004). Your birth weight, your future? *Health*, 18(5), 71.

Cohen, M. (November 2005). What pregnancy really does to your body. *Parents*, 80(11), 135-6 & 140-1.

Horton, M. (2005). Stay active for a healthier cholesterol. *Prevention*, 57(3), 129.

Johnson, M. (July 2005). Bye-bye baby belly. *Prevention*, 57(7), 133-4.

McGinnis, M. (2005). Say ohm for a better pregnancy. *Prevention*, 57(12), 109-110.

Active mom, healthier pregnancy (2006). *Prevention*, 58(6), 46.

Dreisbach, S. (2006). Psst! She's pregnant? *Shape*, 25(10), 42.

Felsenthal, R. (November 2006). Pregnancy myths. *Parents*, 81(11), 199, 201.

Is your workout too easy? (2006). *Shape*, 25(9), 119.

McGinnis, M. (February 2006). Expecting? Start exercising. *Prevention*, 58(2), 151-2.

Murkoff, H. (February 2006). What to expect: Cold remedies; exercising during pregnancy. *Baby Talk*, 71(1), 24-5.

Robbins, S. (2006). How I got my body back. *Shape*, 26(2), 138.

Robbins, S. (2006). Making time for me. *Shape*, 25(10), 140.

Robbins, S. (2006). Pregnant? Read this before you work out. *Shape*, 26(4), 98.

Expectant moms are fit to exercise (2007). *Shape*, 27(1), 135.

Kolata, G. (November 8, 2007). Pregnant exercisers test limits. *New York Times*, p. G8.

Oberdorf, J. (August 2007). Your pregnancy workout. *Parents*, 82(8), 159-60.

Gorney, C. (2008). Pregnant pause. *Runner's World*, 43(3), 80+ (11pages).

McDowell, D. (2008). A bump in the road. *Runner's World*, 43(3), 84.

APPENDIX E

Shape Fit Pregnancy Online Search: Category Description and Number of Articles

Table 2: *Shape Fit Pregnancy* Online Search

Category description	Number of articles from online search
Weight gain, obesity, and pregnancy: Articles related to body size and weight gain but not specific to exercise	7
Miscellaneous 'feature' articles: I identified several longer articles on a variety of topics relevant to exercise but ranging from: body image (3); emotional stress of pregnancy (4); articles providing various tips on how to have a healthy pregnancy/pregnancy do's and don'ts (5)	12
Question and Answer: Venue for women to write in to the *Shape Fit Pregnancy* physician to get advice. I printed off the Q&A articles pertaining to exercise	6
Just the Facts: A one page feature in every issue that outlines the "official" ACOG guidelines. The guidelines varied little over each issue (minor wording changes) but I printed off a few from each year in order to review	11
Small Packages: Short articles featured at the beginning of the magazine that typically provide an excerpt from a recent scientific study	15
Pregnancy Workout Features: Provide various exercise programmes for the readers ranging from weight lifting to pilates to cardio programmes	19

APPENDIX F

Government Texts Reviewed

- *The Canadian mother's book* (1923); Written by Helen MacMurchy, a key figure in the Canadian movement for educating mothers (Publication of the Canada Department of Health).
- *The Canadian mother and child (first edition)*[234] (1940); Written by Couture, E. (Publication of the Canadian Department of National Health and Welfare); *The Canadian mother and child (second edition)* (1953); (Publication of the Canadian Department of National Health and Welfare); *The Canadian mother and child (third edition)* (1967) (Publication of the Canadian Department of National Health and Welfare); *The Canadian mother and child (fourth edition)* (1979) (Published by the Canadian Health Services and Promotion Branch); *The Canadian mother and child: You and your baby* (1991) (Publication of the Canadian Health Services and Promotion Branch).
- *A series of nine prenatal letters for the protection of mother and child (seventh edition)* (1937); Published by the Division on Maternal and Child Hygiene of the Canadian Welfare Council.

[234] This publication replaced the *Canadian mother's book.*

APPENDIX G

Popular Exercise and Pregnancy Texts Reviewed (1970s and 1980s)

NOTE: Identified through Search of the Vancouver Public Library Database

Subject Search Terms: "Exercise for pregnant women" and "Pregnant women -- Health and hygiene".
Date Conducted: March 13, 2008
** Presented in order of date published

Cooper, K. (1970). *The new aerobics*. New York: M. Evans and Company, Inc.

Cooper, M., & Cooper, M. (1972). *Aerobics for women*. New York: M. Evans and Company, Inc.

Bing, E. (1975). *Moving through pregnancy: The complete exercise guide for today's woman*. Indianapolis & New York: Bobbs-Merrill.

Noble, E. (1976). *Essential exercises for the childbearing year: A guide to health and comfort before and after your baby is born*. Boston, MA: Houghton Mifflin Co.

Dilfer, C. (1977). *Your baby, your body: Fitness during pregnancy*. New York: Crown Publishers, Inc.

B.C. Ministry of Health (1980). *Perinatal Fitness (to be used with: Baby's best chance, a perinatal manual for parents*. Victoria: Province of British Columbia, Ministry of Health.

DeLyser, F. & Fonda, J. (1982). *Jane Fonda's pregnancy, birth and recovery workout*. New York: Simon and Schuster.

Fitness Canada. (1983). *Fitness and pregnancy*. Ottawa: Minister of Supply and Services Canada.

Fitness Canada. (1983). *Fitness and pregnancy: A leader's manual*. Ottawa: Fitness & Amateur Sport.

APPENDIX H

Letter of Introduction (Request for Interview)

Examining Medical Knowledge about Prenatal Exercise

Date
Dear participant name,

My name is Shannon Jette and I am a doctoral candidate in the School of Human Kinetics at the University of British Columbia. I am writing to invite you to participate in a study that I am conducting for my doctoral dissertation. The research entails an historical examination of medical knowledge about prenatal exercise and includes: 1) an analysis of medical texts and popular literature about prenatal exercise published over the past several decades and 2) *interviews with health practitioners who care for pregnant women.*

If you agree to participate, you will be interviewed by myself for approximately 30 minutes at a location and time of your choosing. I appreciate that you are very busy and I will ensure that the interview is convenient and efficient. The interview would examine your perspectives on prenatal exercise and your experiences discussing physical activity with pregnant women. The research will help me to gain a fuller understanding of current ideas about prenatal exercise within the health care community, and identify barriers to exercise participation that some pregnant women may encounter. Findings will be used to help guide the creation of prenatal exercise programmes and messaging for a diverse group of women.

An *Information Sheet and Consent Form* is attached. If you would be willing to participate, please contact me at **(778) 868-8383** or by email at jette@interchange.ubc.ca. Your participation would be most appreciated. I look forward to hearing from you.

Sincerely yours,

Shannon Jette
Doctoral Candidate
School of Human Kinetics
(778) 868-8383

APPENDIX I1

Interview Guide: Physicians

Western Medical Knowledge and Prenatal Exercise Advice

Would you tell me about your medical training and background, especially with regards to caring for pregnant women? (i.e., where attended med school, when graduated)

- In what capacity do you currently treat pregnant women?

What were you taught in medical school about prenatal exercise?

- When you first began practicing medicine, what advice would you give to women about prenatal exercise?
- How did this advice compare to general ideas in the medical community at the time?

What advice do you give to your patients about prenatal exercise in your practice today?

- What activities do you recommend? Why?
- Caution against? Why? Dangers of a fall?
- What is your response to patients who ask 'how much' or 'how intense'? Heart rate advice?
- How does your advice vary depending on a woman's health status? Fitness background?
- Under what circumstances do you prescribe rest?

How often does the topic of physical activity come up when you are meeting with pregnant women?

- In your experience, how do women respond to the advice that you give, esp. if tell them to ease off of exercise? Can you recall any instances of women not following your advice?
- What role does body image play in non-compliance, if any?
- Can you recall any negative outcomes due to non-compliance?

In your opinion, how important is it that women exercise during pregnancy?

- What are the benefits?
- The risks involved?
- What are some of the reasons that women do not engage in prenatal exercise? What do you tell them in response?

Recently, I've read a few articles suggesting that women are gaining too much weight during pregnancy, and that this is dangerous for the mother and baby.

- What do you think of this?
- What do you tell your patients about weight gain during pregnancy?
- How might concerns about pregnancy weight gain impact medical ideas about the importance of prenatal exercise?

If you received updates about laboratory-based peer reviewed studies on prenatal exercise, how helpful would this be to your practice?

- Where do you currently get information about prenatal exercise?
- The Canadian Society for Exercise Physiology puts out a form called the PARmedX for pregnancy. How often do you see this form?

In closing, are there any important questions about prenatal exercise that I haven't asked but should have asked? Any other parting comments?
**Wish to review transcript?

APPENDIX I2

Interview Guide: Fitness Instructor

Western Medical Knowledge and Prenatal Exercise Advice

I read your bio on your webpage, but can you tell me a bit more about your background as a fitness instructor?

- What was your initial training? When?
- How did you come to focus on prenatal exercise?

How have ideas about prenatal exercise changed within the health and fitness community during the time you've worked as a trainer, if at all?

- Ideas about the potential risks? The benefits?

Where do you currently get information about prenatal exercise?

- What is the role of the Canadian Society of Obstetricians and Gynecologists in providing information?

Could you tell me more about the certification course you teach?

- What information sources do you base your course content on?
- What is the role of the Canadian Society of Obstetricians and Gynecologists in providing information?

How is information (new ideas) about prenatal exercise communicated to the health care community?

- In your opinion, how effective is communication? To fitness trainers? To doctors?

What are some of the most common questions that women ask about prenatal exercise?

- What are their biggest concerns?

Could you tell me more about your exercise programme?

- What activities do you recommend for your clients? Why?
- Caution against? Why?
- How do you determine how much a woman should do?
- How does your advice vary depending on a woman's health status?

In your experience, what are some of the sources women are getting information about prenatal exercise from?

- What is the role of women's doctors in teaching them about prenatal exercise?
- How well-informed are the majority of physicians about prenatal exercise?

In your opinion, how important is it that women exercise during pregnancy?

- In your experience, what are some of the reasons that women do not engage in prenatal exercise?
- What do you tell them in response?

Recently, there have been concerns that women are gaining too much weight during pregnancy.

- What do you think of this?
- What do you tell your clients about weight gain during pregnancy?
- How might concerns about pregnancy weight gain impact medical ideas about the importance of prenatal exercise?

In closing, are there any important questions about prenatal exercise that I haven't asked but should have asked? Any other parting comments?

***Wish to review transcript?

APPENDIX J

UBC Behavioural Research Ethics Board: Certificate of Approval

The University of British Columbia
Office of Research Services
Behavioural Research Ethics Board
Suite 102, 6190 Agronomy Road,
Vancouver, B.C. V6T 1Z3

CERTIFICATE OF APPROVAL - MINIMAL RISK

PRINCIPAL INVESTIGATOR:	INSTITUTION / DEPARTMENT:	UBC BREB NUMBER:
Patricia A. Vertinsky	UBC/Education/Human Kinetics	H07-00344

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:

Institution	Site
UBC	Point Grey Site

Other locations where the research will be conducted:
Private physician's office Fitness facility (i.e., community centre or gym)

CO-INVESTIGATOR(S):
Brian Wilson

SPONSORING AGENCIES:
N/A

PROJECT TITLE:
Fit for Two: Examining Medical Knowledge About Prenatal Exercise

CERTIFICATE EXPIRY DATE: May 3, 2008

DOCUMENTS INCLUDED IN THIS APPROVAL:		DATE APPROVED: May 3, 2007
Document Name	**Version**	**Date**
Consent Forms:		
Information Sheet and Consent Form	N/A	May 2, 2007
Questionnaire, Questionnaire Cover Letter, Tests:		
Interview Guide for Medical Doctors	N/A	April 20, 2007
Interview Guide for Fitness Trainers	N/A	April 20, 2007
Interview Guide for Exercise Scientists	N/A	April 20, 2007
Letter of Initial Contact:		
Contact Letter Exercise Scientists	N/A	April 20, 2007
Contact Letter Medical Doctors	N/A	April 20, 2007
Contact Letter Fitness Trainers	N/A	April 20, 2007

The application for ethical review and the document(s) listed above have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects.

Approval is issued on behalf of the Behavioural Research Ethics Board and signed electronically by one of the following:

Dr. Peter Suedfeld, Chair
Dr. Jim Rupert, Associate Chair
Dr. Arminee Kazanjian, Associate Chair
Dr. M. Judith Lynam, Associate Chair
Dr. Laurie Ford, Associate Chair

APPENDIX K

Information Sheet and Consent Form

Study Title: Examining Medical Knowledge about Prenatal Exercise

Brief Description of the Study: This study aims to find out more about:

- How ideas about prenatal exercise (i.e., what is safe or unsafe) have changed over the years within the medical community.
- Health care professionals' understandings of and opinions about prenatal exercise, and their experiences discussing physical activity with pregnant women.
- Women's common questions and concerns about prenatal exercise.
- The barriers that women encounter which may prevent them from engaging in physical activity while pregnant.

The hope is that the study results can be used to help researchers and practitioners create effective health promotion messages and exercise programmes for pregnant women. The information generated in the project may also be used by policy makers to increase physical fitness opportunities for groups of women who face participation barriers.

The research is being conducted by Shannon Jette, a graduate student in the School of Human Kinetics at the University of British Columbia, as part of her doctoral dissertation. Her supervisors, Dr. Patricia Vertinsky, a professor in the School of Human Kinetics at UBC and Dr. Brian Wilson, an associate professor in the School of Human Kinetics at UBC, are overseeing the project.

The Interview and Your Participation: Your perspectives on prenatal exercise and your experiences communicating this information to women would be extremely helpful and much appreciated as we try to find out more about the topics mentioned above. The interview would take approximately 30 minutes and would be conducted at your place of work (i.e., medical office, clinic, hospital) or another location of your convenience. Most of the questions are fairly general. The interview will be recorded on a cassette recorder.

Confidentiality and Anonymity: All information resulting from the interview will be kept confidential and your name will not be referred to in any of the documents emerging from the completed study. The transcripts from the data will be secured by password on a computer and the audiotapes will be secured in a locked cabinet. *Consent forms* (see below) will be kept separately from the interview materials in a sealed envelope and locked file. According to University of British Columbia regulations, the transcripts and consent forms will be stored for five years and then destroyed by shredding. Tapes will be demagnetized and destroyed after the five year period. The computer data files will be stored for five years and then erased.

Interview Feedback:
The interview transcripts will be sent directly to interested participants so that they may ensure that the researcher has captured their ideas and opinions accurately.

The Interview Results:
The interview findings will be published in an academic graduate thesis and related articles. The hope is that the study results can be used to gain a better understanding of current ideas around prenatal exercise, as well as to help researchers and practitioners create effective and inclusive health promotion messages and programmes.

Your Voluntary Participation: Your participation in the study is entirely voluntary. You are free to not answer any question, and you may withdraw from the interview at any time. If you have any concerns about your treatment or rights as a research subject, feel free to telephone the Office of Research Services at the University of British Columbia, at (604) 822-8598.

Further Contact Information or Concerns: If you have questions or desire further information about the project, please contact Shannon Jette, the graduate student who is conducting the research for her doctoral dissertation at (778) 868-8383 or her supervisors, Dr. Patricia Vertinsky at (604) 822-6235 or Dr. Brian Wilson at (604) 822-3884.

CONSENT

I have read the above information and understand the nature of the study. I understand that participation in this study is entirely voluntary and that I may refuse to participate in or withdraw from the study at any time.

I hereby agree to the above stated conditions and consent to participate in this study.

Your signature below indicates that you have received a copy of this consent form for your own records. Your signature also indicates that you consent to participate in this study.

Signed:_____

Date:_____

APPENDIX L

Seven Aims of Archaeological Research (Kendall and Wickham, 1999)

1) to chart the relation between the sayable and the visible. The researcher attends to both what is said (e.g., theories of fitness training, exercise prescriptions) and what is visible (fitness centres, skin-fold calipers).
2) to analyze the relation between one statement and other statements or how the system of statements works (for example, the ordering of statements so that official exercise positions created by ACOG are passed onto fitness trainers and used as framework for what trainer tells clients)
3) to formulate the rules for the repeatability of statements (or that make some statements to become accepted as 'true')
4) to focus on the ways that statements produce subject positions, or ways of being and acting that humans take up.
5) to describe 'surfaces of emergence' (focuses on the *places* within which objects are designated and acted upon such as the hospital or the prenatal clinic).
6) to describe 'institutions' which acquire authority and provide limits within which discursive objects may exist/act (e.g., examine the architectural structure of a fitness gym which has spatial arrangements which encourage certain actions and discourages others).
7) to describe 'forms' of specification' (or the special vocabulary or language) which refer to the ways in which discursive objects are targeted.

APPENDIX M

Explanation of Data Analysis: Organizing and Coding Data

To analyze the data collected in the first three Results chapters (Chapters Four through Six), I read through the collected texts several times, focusing on texts from similar time periods. I identified central themes and tagged the pages with post-it notes (colour-coded according to theme). The themes identified were quite broad and mostly substantive in nature (i.e., 'exercise advice,' 'women's roles,' 'professional power,' 'yummy mummy,' and 'weight gain'). I then re-read the texts once they were grouped together according to themes (some texts were coded for two or three different themes) and looked closely at the key messages being put forth, also noting 'negative examples' or exceptions to the main themes or messages. At this stage I began to write a narrative regarding what was 'sayable' and what was not 'sayable' about exercise for pregnant women (also attending to what was being said about their societal roles, who was defining the rules for what was sayable and not sayable and the knowledge or ways of thinking these rules appeared to be based upon). Once I had written a general narrative or 'story,' I re-examined it through a lens of governmentality, identifying the key problems during specific time periods and the practices put into place to solve these problems (focusing specifically on the role of exercise in the governmental equation). I also used Kendall and Wickam's (1999) steps of archaeological research to guide my analysis.