Constructing modality with syntactic intentionality

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Abstract

Attempts to conceptualize intentionality† address important aspects about what it is to be human. Intentionality has been called many things: the central concept of psychology and philosophy of mind; the basic criterion for distinguishing the mental from the physical; the engine of consciousness; and more. We accept as common sense that such things as agency, subjectivity and intentionality are real but there is great difficulty in grounding these in anything empirical. The use of formal language‡ can provide a kind of observable data or manifest behaviour whereby representations for intentionality can be explored. In the following chapters, a highly constrained notion of intentionality is defined, and if not grounded, it is found to maintain a fixed habitat or locus within the syntactic structure of statements. Various kinds of formal language have been used for centuries but only in the last, have developments such as Frege’s work in 1884 made mathematics and some parts of language explicable in terms of logic. And only in the last few decades has a functional syntax for natural language begun to satisfy scientific standards. The functions exercised by inflection (understanding it as deep governors of tense, aspect, person, number and gender within speech behaviour) have received increasing prominence in recent years. Inflection has been shown both to reside at the foundation of language use while at the same time emanating controls which structure the outer shape of our communication. Intentionality and language poesis remain profoundly mysterious, yet before we are two years old, we are able to exercise them quite effortlessly. Attempts to particularize the display of intentionality within language helps to silhouette the interaction of consciousness with the world.

FL and natural language theory posit primitive categories which may be treated phenomenologically. These provide candidates for mapping an Husserlian construct for intentionality onto syntactic structures. This central task of this research explores that mapping within two general activities:

(1) using an interpretation of early phenomenology, a basic goal is to make use of any FL expressions which might serve as a matrix for looking at a narrow notion of intentionality, and use these to describe a control structure for part of the spectrum of modal or contingent propositions in English;

(2) through the mediation of participatory action research used in finding potential resources, for the conduct of enquiries, and for the analysis of responses. Resources are sought within three media (internetworked or electronic enquiry, print resources and interviews). Action research enables a framework for looking at intentionality and modality in FL through the asking of questions, the obtaining of ‘answers’ and analysis of found text and responses for usable content.

† Initially, intentionality may be defined as consciousness of some object or event.
‡ The acronym FL will be used as a shorthand for formal language representations. Simple curriculum elements from mathematics, logic, and natural and computer languages are treated as a whole in these chapters. No single term seems to be available to express a simple generalization across this grouping.
The directly relevant body of literature is not enormous, but has proven to be very challenging. Little material was found that addressed the central topic directly (that is, how the mechanics of sentential modality can be examined within a phenomenological method) but grammatical categories are available which track closely with a phenomenological approach. At this time — in the decade of the brain and when explosive growth is occurring in computational theory — attempts to link the functionalism of formal theories with the basic intuitions and feelings we all have (especially the vitality associated with using language to express our desires and experiences) have led to vigorous refractions of the enduring problems of philosophy. Because this literature is frequently associated with artificial intelligence and devising proper ontological and epistemological categories, source material is often at a level of rigor that is beyond the tenor of the work that follows. Since an aim of this work is to try to treat syntactic operations within FL as useful constructs within a basic scientific education, this research strives to provide simple readable descriptions that do not require a great deal of background knowledge.

The global Internet facilitates interactive communication within diverse academic disciplines. Computers as tools allow extensions to the action research cycle, ease the manipulation of large text corpuses, and amplify enquiries by enabling connections to scholars not otherwise readily accessible. A participatory action research methodology provides a framework of flexible methods appropriate both to the central task and to the communication medium of the Internet.

Probe questions were constructed to enact elicitation strategies. These query tools were used to reach out into selected academic communities through the medium of electronic discourse, seeking improvement or repudiation of their content. The construct validity of the probe questions' content has undergone examination through research, reflection, and consultation with academics in various faculties. The probes achieve some rigor, but may stimulate responses which require more erudite analysis than can occur here, thus re-enforcing the tentative or formative character of this work. Much of the work aims at finding consensus, coherency, or disconfirmation for the probes, and in seeking formal mechanics which maintain construct validity. A relationship between intentionality and modality in calculus and language is also explored on the belief that some limited progress into a more systematic description may be possible by adopting the perspective suggested by Edmund Husserl’s transcendental phenomenology.
### Constructing modality with syntactic intentionality

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My own department, Curriculum Studies at the University of British Columbia, generously made available support monies and computing machinery which have been invaluable to me. The Department of English kindly allowed me unrestricted access to the OED on CD-ROM. The UBC Department of Linguistics (especially Dr. Michael Rochemont) exposed me to a careful and scientific approach to language.

I would also like to thank the Computing Science Department at UBC for the use of Houdini, a NeXT machine on the Internet. The University of British Columbia (through the agency of Education Computing Services and University Computing Services) permitted generous computing time and other learning experiences which, although they no longer figure directly in these pages, have been a source of pleasure and edification.
Shuzan held out his short staff and said,

"If you call this a short staff, you oppose its reality.
If you do not call it a short staff, you ignore the fact.
Now what do you wish to call this?"

— traditional Zen koan (c. 900 C.E.)
1 Introduction

This chapter provides background material to the central query, and introduces the phenomenological method adopted. In later chapters, basic formal relations are presented — with a focus on sentences — in order to determine if a syntactic representation for intentionality will stand up to examination. Chapter Two is an experiment in talking about FL syntax phenomenologically and goes into the conceptual underpinnings in more depth. Chapter Three describes a narrow and syntactically-bound expression for intentionality and an effort towards constructing selected types of modality. Chapter Four summarizes the data collection, discusses the formative character of this project and concludes.

Some persons may take offense at the thesis title, saying there’s no such thing as intentionality, and, if there is, it certainly isn’t grounded in syntax. In response, I don’t necessarily believe in intentionality, objectively. It is treated here as a local phenomena to FL, perhaps allied with how one may entertain having independent thoughts or free will for part of the day, even though their objective existence is in doubt. The syntactic focus is on phenomenological or eidetically-perceived form, eschewing semantics.

1.1 Conventions

A few typographic conventions have been used to help achieve uniform expression.

1. When focus upon a word as a physical form-in-use is intended (concerning that word’s orthography or physical expression) then small capitals will be used, e.g., COULD. (I appreciate that this is an irreparably ambiguous notion, but intend that it be interpreted loosely, trusting in the reader’s judgment and flexibility to respond as if the word were stressed, “quoted” or made bold.)

2. Words may be italicized for emphasis when they are a focus or being illustrated in the text.

3. Where one or more items are to be chosen from a list or set, curled parentheses will be used, e.g.,

   some modal auxiliary verbs: { WILL WOULD SHALL SHOULD CAN COULD MAY MIGHT MUST }.

4. Square brackets and text in Helvetica type denote object boundaries and contents (adopted from those traditionally used to denote syntactic phrases), e.g.,

   [verb phrase to distinguish [noun phrase noun phrases ] [prep phrase from [NP prepositional phrases ]]].

5. Editorial additions within quotations are also indicated with square brackets. (The context will always permit differentiation from the category boundaries found in 4. above).

6. All text in examples, figures and tables (with the exception of computer instructions) is displayed in Helvetica and is referenced by its number, e.g., 1.3.1 below references a line in §1.3 on page 10:

   1.3.1 Color the page white.
1.2 History

My interest in this subject began while helping to develop a learner’s dictionary, a dictionary of simple definitions to facilitate improved reading skills. In this project, a half dozen function words were defined as “without meaning” and yet their presence was often obligatory in the sentence. (These words were restricted to some of the denotations of the relative conjunctions \textsc{that} and \textsc{which}, auxiliary \textsc{do}, expletives \textsc{but} and \textsc{so} and infinitival \textsc{to}, their meaninglessness countenanced by reputable dictionaries.) This struck me as being extremely odd, since, intuitively, why should a word exist if it doesn’t convey meaning to us. This situation still persists, for example, in the current Oxford English Dictionary’s entry for infinitival \textsc{to} (this entry has remained stable from 1928 through the CD-ROM’s second version in 1992, hereafter referred to as OED-CD). An extracted portion reads:

\begin{quote}
B: ... To a certain extent, therefore, i.e. when the infinitive is the subject or direct object, \textsc{to} has lost all its meaning, and become a mere ‘sign’ or prefix of the infinitive. ...

B III [before definitions 13 a, b and 14 a, b]: With infinitive in substantival relation. Equivalent to a noun or gerund: \textsc{to} being ultimately reduced to a mere ‘sign’ of the infinitive without any meaning of its own. [The infinitive is used in noun phrase position. One usage example follows below] ...

1709 Pope Ess. Crit. 525 [Essays on Criticism] To err is human, to forgive, divine. ...

Oxford English Dictionary, Ti-Tz:89.
\end{quote}

Infinitival \textsc{to} was the most interesting and problematic. The infinitive form is traditionally mandated in the stating of curriculum objectives, and still is a principal workhorse in listing purposes or in stating goals [ \textsc{to} make the best coffee ]. Why we have to use it in a sentence (cf., [ John plans to leave. ] versus [ ‘John plans leave. ]\textsuperscript{†}) becomes rather less than obvious when following verbs like \textsc{plan} or \textsc{want} which have a markedly cognitive character. Compare these last two sentences with its more overt and purposive presence in a sentence such as [ \textsc{Use the brake to stop. }]. It is interesting that any attempt to define a modal auxiliary verb in a manner that permits direct substitution back into the sentence always requires the presence of infinitival \textsc{to}. On two interpretations of \textsc{can}: [ John can leave. ] may be paraphrased as [ John is able to leave. ] or, [ John is permitted to leave. ]. In its absence, grammaticality is violated. (The use of quasi-equivalent gerund forms as in [ John is capable of leaving. ] is not dealt with in these pages.) A standard explanation is that infinitival \textsc{to} has grammatical meaning, but is sometimes devoid of any lexical or ‘semantic’ meaning. Such an answer defers understanding into further theory.

\textsuperscript{†} Ungrammatical sentences are marked with an asterisk. Grammaticality or native speaker acceptability is a key heuristic for finding data. Grammaticality might be seen as a fundamental kind of cognitive gestalt, and a lack of grammaticality as a violation of this whole. (This is not always true as, in some cases, some language forms may appear or endure, even though they are more constructed or prescriptive than they are \textit{natural}.) Languages have evolved organically through perhaps a hundred thousand years of adding and losing features, always maintaining some natural ecology for ensuring that thought is adequately transmitted. We can, in some limited sense, create vocabulary items and novel phrasings which, over time, may survive in the ‘shared economy’, but coherent thought and expression fall within grammaticality, and not the other way around. “Language is the house of being” is Heidegger’s memorable phrase. A grammatical construction refers to meaningful \textit{things}, regardless of how phenomenologically inexistential these may be, and is, in this sense, real.
and in that pursuit I was led to both modern and traditional grammars. I continued to be intrigued enough to return to university.

What ‘part of speech’ infinitival to should be called remains controversial. It is not a preposition, not a verb, etc. That controversy has continued to grow as, for theoretical reasons, this particular category (whatever it is) is extremely important to understanding basic sentence structure in natural language and thus to computational uses of language. Trying to understand these semantically empty words permits what might be seen as a kind of horizon to human cognition, and leads to productive controversies about the nature of words. Examined with reasonable care, such small function words stimulate appreciation for the vastness and aesthetics of language. As a concrete example, comparing the definitions of a few dozen major prepositions in English yields a practicable education in the philosophy of space and time as it relates to consciousness and how this (mostly unreflected) knowledge is used in daily life. There are other ‘semantically empty’ words as well, and the results of some electronic searches on this topic can be found in Appendix A.1 along with a brief typological profile of what kinds of words will fall into this classification.

Distributional facts such as the appearance of infinitival to in contexts such as the preceding example of can led me to try to understand more about modality. The term modality is used here in a broad sense. Perhaps most frequently, it stands for the underlying stance of an utterance or statement, viz., the traditional verbal moods such as the declarative, imperative, subjunctive, hypothetical, conditional, future tense, et al. Under some interpretations, these sentential modes may be expanded to include other intentional fundaments such as the negative and interrogative, and the choice of tense. When we negate or query or put something in the past, we mean to. Modal sentences express the framing of our states of mind, and very nearly rub up against the more basal states of the emotions. The study of modality also highlights, as has often been noted, that we live largely in states of contingency: desiring, intending, and needing things from the past, present and future. Recently, this traditional sense of modality has often been broadened to indicate the “manner of being” of smaller elements than the whole sentence, words that are marked by the grammatical categories of person, number, and gender (Palmer:208-225; Kristeva:32).

I know of no claim to describe the inner workings of modality, and neither is one here. Grammar texts list the types of modality that are found in natural languages, texts in modal logic examine the mapping between natural language expressions and symbolic controls on variables and inference, that is, how well modal sentences can be mapped onto consistent, reliable and truth-forwarding formalizations.

† For the sake of simplicity, the usual sense of the umbrella term irrealis. will be expanded from covering these last three or four categories to any sentential mood or mode that is non-finite, that is, not in the direct past or present tense (i.e., ny non-indicative or non-declarative) mood. The wishing or conjecturing or compelling is real (i.e., it occurs in some finite moment, but its conscious object or act is not yet an actuality). The words mood and mode will be used interchangeably. There are numerous categories for verbal mood. Please see Table 3.5.
Syntactic theories provide some internal mechanics but very little of this extends beyond the parameters of the sentence. The theoretical approaches taken in logic and syntax always indicate that modality envelopes the sentence, that is, it is a frame that lies outside simple propositional structure. Philosophy of language will examine epistemology and slippage in any of these domains. Nowhere is there any deeper attempt to describe modality than that found in phenomenology. There, both topics of intentionality and modality are found because of their intimate association with the deep relations in stances or attitudes that determine the apprehension of perception, language and consciousness. But phenomenological descriptions tend to be finely tuned characterizations of the layers or types of perception and thinking. Looking at infinitival TO promotes a different kind of description, still not explanation, but a simple mechanic about syntactic directedness.

As an admission of either of how large the academic world is, or how ignorant I am, I hadn’t heard of phenomenology until I was halfway through this thesis. This was not long after I encountered the formal use of the word INTENTIONALITY. I’d thought of the meaning of underlying infinitival TO’s modal contexts as a kind of varying determinism or agency, or as a nondualistic relation. The term NONDUAL has considerable heft in Vedic and other non-Western philosophy (ADVAITA in Advaita Vedanta means ‘not two’). Nonduality asserts that basic ontological realities are not ultimately split into two things and yet in practice they are, and (or) they are also both realities simultaneously. It is about connectedness and deep relations for action and causality. The term means different trinitarian things which manage understandings in theology similar to how the Hegelian dialectic of thesis-antithesis-synthesis provides a valued transcendental explanation for many persons. I also like to see nonduality as a kind of horizon concept: an ultimate sleight of hand or effort to terminate discussion either by removal of the ground or letting it swallow everything up. Like more fatuous monisms (viz., “Everything is the same.” or “We are all one.”) it can categorize triadic thinking in philosophy and other belief systems. This comment is not intended to trivialize nonduality; the notion is too compelling for that. It is a foreshadowing note about a phenomenological aspect of infinitival TO and modality, along with a caution that topics that have effability problems warrant special care.

There are a multitude of conundrums about intentionality and elusive chimeras associated with cognition. Using a broad notion for modality and restricting this study to overt speech behaviour and the categories given by formal language syntax reduces (perhaps bypasses) but does not solve these troubles. The pages that follow do not try to engage the philosophy of mind and artificial intelligence directly but these disciplines necessarily figure in the mix. The effort in this work is to try to restrict the study to simple forms of FL syntax and representations. Regrettably, there are numerous boundary phenomena that attend to this topic, potentially subverting the effort, and I am not clear if the chosen path circumnavigates them free of ill-effects.
This thesis began with research about hypertext design and the navigational problems of electronic documents while studying the use of computers in science education. It then grew into studying the conduct of electronic research when contrasted with print and human resources. Always at the core were queries about intentionality and modality, notion which appear to me to permit a cross-pollination of formal approaches to language with science education. These queries to be incorporated as examples of probe questions for examining the use of new electronic tools for doing research in the humanities. Over time, the probe questions gradually came to the forefront and now dominate this work. An attempt to ground an introduction and argument for the value and underlying content of these probe questions comprises the content of this thesis.
1.3 A phenomenological approach to modality

The mental association of ideas and objects has long been viewed as a fundamental act of cognition, probably long before Locke asserted it to be the principal activity of the mind. This work examines narrow aspects of association found within FL. Before we can engage in more developed acts of association (or comparison; or contrast) we first decide what objects belong together. Such constructed associations exhibit found or created relations: intentionality as an act of referencing or attention, the choosing of objects for focus, or simply, acts of consciousness. More properly developed definitions for intentionality will follow in Chapters Two and Three, and one particular definition then receives major attention. Methods are adopted from structural phenomenology, and the simplest of relations or forms are used from introductory theory in language, mathematics and logic.

Incoming information is transduced through eye or ear or skin. Meaningfulness from outside is realized through knowledge of forms in syntactic relation\(^1\) in order to construct an understanding of incoming identities, stories and facts. For example, when we hear speech, we know when two adjacent words are part of the same notion and when they are not, that is, we know where the sentence (or other phrasal) boundaries are located. Consequently, we won’t ideationally link words from the end of one sentence onto the start of another. Even if such are construable, we internally construct a set or phrase grouping keeping them apart. Though this fact is exceedingly obvious, more sophisticated acts follow from it.

\(^1\) Syntax is used in the basic sense of ordering or sequencing relations between meaningful elements or groups of elements. It may also include aspects of control, such as which antecedent belongs to which pronoun or what governing domain or scope applies to a quantifier or a tensed verb.
Many associations found within FL are clearly of the speaker's or writer's own making, but other communicative patterns are unconsciously conditioned by external physical and cultural realities. Recent advances in grammar have made the interior atoms and connections of expressions more amenable to inspection. Using modern syntactic theory within a phenomenological perspective, some mechanical aspects that describe or control the expression of a speaker's stance may be modeled.

Of the many complexities associated with language, perhaps the most prominent is its simultaneously public and private character. We all share the work of machining and forwarding its consensual form, but the individual experience of language can only be subjective. Phenomenology provides a method for describing subjective experience. Immediately and problematically, this embraces all perception and extends to myriad ontological and epistemological matters of consciousness and how it is that we constitute the world through our senses. There were earlier uses of the term, but Husserl revitalized it, delimited the discipline, and endeavoured to distinguish his enterprise from descriptive psychology. Throughout his life, he engaged in a rigorous and evolving research effort towards developing a "pure phenomenology" and a "science of phenomena" (Husserl, Ideas:37). His efforts can not be characterized as entirely successful and he is often disparaged for unreadability, but it would be very unfair if this were all that is said. The intractability of the problems that he addressed, and the innovative way in which he addressed them, continues to generate inspiration and periodic revivals of his methodology.

Edmund Husserl (1859-1938) is referred to as the 'founder of phenomenology'. He was a student under Franz Brentano (1838-1917) at the University of Vienna. Brentano and Ernst Mach (1838-1916) put faculty or sense psychology onto its modern path. (Mach did other wide-ranging studies in the sciences and the philosophy of science.) Martin Heidegger (1889-1976) was in turn a student of Husserl. Particular attention is paid to Husserl as he provides a particularly cogent and enthusiastic expression for intentionality, one that both invites extension and is assumed to be compatible with the narrow orientation to propositional structure in this work. Husserl studied formal aspects of perception, language, time-consciousness, modes of experience, and mathematical, logical, and other scientific aspects of cognition.

Figure 1.2 Edmund Husserl

† Unattributed image from a Hong Kong archive at ftp://humanum.arts.cuhk.hk/pub/Images/Philosophy/Husserl (96.02.28).
Husserlian phenomenology is described as *transcendental*, using this word in its Kantian sense, distinct from the term *transcendent* for that which exceeds experience. The term *transcendental* means “the logical apparatus of concepts and principles, common to all rational minds, that organizes experience and is thus logically prior to it. The transcendental aspect of the mind’s operations can be elicited by a critical philosophy that works out the pre-suppositions of our knowledge.” (Quinton in Bullock and Stallybrass:642). Kant’s use of transcendental arguments “is intended to establish that possession and application of certain concepts is indispensable to empirical experience” (Quinton, ibid.).

Transcendental phenomenology is concerned with the a priori elements of experience that condition human knowledge. This should be ideal for thinking about the underlying conditions that aid the performance of human language. Alas, we don’t have much certainty about this kind of knowledge.

The term “transcendental” implies pure reflection. Kant indicated its general nature when he explained “transcendental” as meaning attending to the experience of an object, rather than to the object itself. The aim of phenomenology is to make this reflection as “radical” as possible; proceeding to the sources of certainty or “evidence” in immediate experience, and “questioning” everything for its evidence. Toward that end, a procedure of “reduction” is instituted, requiring the suspension of all beliefs, and of all scientific knowledge as well. Descartes’ method of doubt serves as convenient means of introducing the method of phenomenology. One could be mistaken in judgments about the world, or anything “transcending” experience, but “immanent” experiences concerning the world, or concerning any alleged or imagined objects, could not be doubted.

The aim of phenomenology is, then, to delimit the entire, endless realm of experiences, in all their types — perception, phantasy, etc. All beliefs in truths of any kind are suspended, and we are left with the experiences themselves, and with the objectivities meant by them. … With all beliefs placed in abeyance as a matter of method, one can speak of “pure subjectivity”, or of “pure experience”. It is a “radical” procedure because all natural and traditional assumptions have been suspended. It would be a misunderstanding, however, to infer that the world has been “discarded” or denied. The “thesis” of existence is simply “put out of play”, and the “world” is the correlate of my meaningful experience, not regarded as independently real. It is a “bracketed” world.

… But when all things are viewed as objects for experience, it is appropriate to speak of the synthetic and “idealising” processes by which complex structures and meanings are “constituted” out of the stream of experiences. (Urmson and Rée, 1989:233-4 [all quotations in original]).

Under Husserl’s method, the next step after bracketing an object is a second reduction, the eidetic reduction, which is often seen as a kind of thought experiment in which the perceived object is freely (but carefully) varied to see what observations or understandings ensue. This method of free variation might be allied to the testing of patterns that we can examine through the overt object-records of FL or manifest speech (grammaticality testing of sentences, or playing with logician’s tables or algorithms to see what anomalies or failures occur). This may seem trivial, but this kind of child’s play is basic science, and, seen as the method of free variation, a principle diagnostic tool of syntax.

Phenomenology “takes philosophy to begin from an exact, attentive inspection of one’s mental, particularly intellectual, processes in which all assumptions about the causation, consequences, and wider significance about the mental process are eliminated (‘bracketed’). Husserl was insistent that phenomenology is not an empirical technique. It is an a priori investigation of essences or meanings, the objective logical elements in thought that are common to different minds” (Quinton:468). One would be naïve to accept absolute interpretations of the preceding paragraphs, or to think that bracketing or reduction is ever so well accomplished. We can not rid ourselves of “all assumptions” and beliefs and
put all thetic notions “out of play” and achieve “pure subjectivity”. But we can be “as radical as possible” and try for increasing purity in our own understandings. Nor, as has often been noted, does a single lifetime permit determination of all our knowledge from first principles, so to various degrees, we must of necessity, albeit skeptically and dialectically, use descriptions and findings handed down to us. In this regard, we have a stable inheritance of two-thousand-year-old notions for some of the grammatical categories, and some of these have arisen independently in different historical cultures. Providing that syntactic categories may subsumed under the phenomenological method, I can inherit the work of the thousands of men and women who are trying to arrive at sound empirical understanding by exchanging their knowledge about the thousands of natural languages which have received fieldwork and the application of these categories.

With its emphasis on description, phenomenology may be seen as a special kind of structuralism, or perhaps, structuralist approaches might be seen as instances of phenomenology. But because of its intimate coordination with human experience, it is simultaneously allied with qualitative techniques. Husserl’s exhortation “Zu den Sachen selbst” or, “(back) to the things themselves” is frequently quoted. Many persons have been struck by this goal of perceptual integrity (sometimes the preceding imperative is translated as “return to the data itself”) and begin a journey towards the “true meaning” of Husserl’s enterprise (“absolute data grasped in pure immanent intuition”, Encyclopædia Britannica, v. 25:635). But immediately, complications intrude, for the perception of things melds with experience and knowledge and we find “the enormously complex and complicated manner in which description and interpretation are intertwined within phenomenology” (Mohanty, 1989:64-5).

Husserl wanted to use his phenomenology to reorder philosophy and science. His efforts may be seen as a critique “to show the need for a ‘rational psychology’, which would do for ‘naturalistic psychology’ what geometry has done for physical science. Husserl portrayed phenomenology as the ‘mother-ground’ for all the basic concepts and principles of the sciences. The ‘First Philosophy’ which he envisaged was to be truly the ‘foundation’ for all knowledge which could hope to be scientific.” (Urmson and Rée:235).

Following Husserl’s transcendental phenomenology, other perspectives on cognition were brought into the methodology. Particularly, feelings, emotions and wider aspects of human nature were fronted in other phenomenological interpretations. These fertile enterprises continue, and we see ongoing efforts such as those in artificial intelligence and psychoanalytic theories to embrace some version of basic drive states (aping the matrix of the human body), instincts or emotions as founding constructs to make better and more usable machines. Heidegger changed the focus of phenomenology to make it more hermeneutic, yielding a phenomenology that is more holistic, grounded in the world and descriptive of authentic human and aesthetic events. Merleau-Ponty focused his work on the body, treating acts and
language as the extensions of being human. A rich array of existential interpretations has also arisen, far too extensive to try to summarize here.

Arguments about how sentences are constituted deliver some of the best windows we have onto a scientific view of cognition. The sentence has, in a sense, been Noam Chomsky's work: generative grammars which have revolutionized psychology and enabled the first computational treatments and machine translations of natural language. Edie (1987:23-36, 42-59) and Kristeva (1987:221-223) both suggest parallels between Chomsky and Husserl: Chomsky in his movements toward deep structures, universal grammar, or the base (however it is to be conceived); Husserl as he sought a "pure logical grammar" which expresses a priori mental structures. Both need the sentence as the basic frame for grammar. Indeed, most grammars are concerned with constructing the sentence, even if they don't indicate that fact explicitly, and even if they use different building blocks to get there. Gottlob Frege, the founder of modern symbolic logic and another mentor of Husserl, makes an early assertion of the primacy of the sentence for analysis: "In a letter to Russell, Frege says 'The analysis of the sentence corresponds to an analysis of the Thought and this in turn to something in the domain of reference, and I should like to call this a primitive logical fact'" (Currie, 1982:123.22). Outside of advances in neurology, the sentence is the objective structure which permits some inspection of thought — there is no controversy concerning this. In informal discourse, we frequently can manage very well with sentence fragments, but that is another problem for a grammar of how deletion or ellipsis occurs, a phenomena which belongs in its own context, using rules derived from the wholeness of the sentence.

It is useful to see some fundamental syntactic constructs (for example, the association and separation that is imposed upon elements by the use of brackets) as corresponding quite well with the pivotal underlying controls for how we parse or make knowledge from the worlds outside ourselves. I conceive this use of syntactic constructs in symbol-interpretation as grounded in phenomenological approaches. To foreshadow aspects of Chapters Two, a simple case of such a base construct is the general locking-in of interpretation from left-to-right in English, thus the different positions of the adjective white below bring variant interpretations to their adjacent nouns and how this injunction is to be conceived.

1.3.1 Color the page white. (so that the page becomes white)
1.3.2 Color the white page. (so that it becomes another colour)

Germane to this work is examination of the schemes used to disambiguate expressions. In arithmetic, students are taught to order precedence of operators as \( \times + - \) thus denying that \( [2 + 5 \times 2] \) can be \( [14] \). We are taught to construct the relations between these numbers as \( [2 + (5 \times 2)] \). Of course, this result is an artifact of education or consensus, and has no necessity about it. Certainly, in another context, the answer \( [12] \) might not necessarily be correct. In natural language, ambiguities may be resolved by assigning controlling syntactic structures. When a received statement remains ambiguous,
we have failed to find an applicable pattern from our knowledge of a relevant world, knowledge of the moment or knowledge of language. When these schemes work for us, the statement is disambiguated.

1.3.3 John may leave tonight. \( \text{(John is likely to leave tonight \ldots John has agency.)} \)

1.3.4 John may leave tonight. \( \text{(John is allowed to leave tonight \ldots another has agency.)} \)

Other examples of ambiguity typically found in textbooks (viz., Visiting relatives can be boring, or Jack saw John and then Jill saw him) are represented by giving the competing interpretations a meta-structure which differentiates the two possibilities. Frequently, the context of the utterance facilitates automatic resolution without pausing to consider any other possibility.

It has been claimed that phenomenological treatment of language or syntactic theory is impossible but under another perspective, all of linguistics could be seen as a structuralist enterprise subsumed under phenomenology: as a formal language or set of meta-representations for understanding perceived forms. This is the perspective under which Husserl conceived phenomenology: as a preëminent discipline for comprehending the world, a first philosophy above science. Such a view seems foolish when the small successes of phenomenology are contrasted with scientific enterprises which have extended perception inward to quarks and outward to fifteen billion years past, but more valid when applied to fundamental constituents of FL which are, quintessentially, about our conscious or perceptual grip on the basic structure of events and things in the world. Husserl's first work addressed the philosophy of arithmetic. The categorial elements of mathematics and logic have been much more reliably reified than those of natural language (compare their successes in capturing rich physical behaviours and causal relationships) but despite the resistance of natural language, capturing it through dynamic functional grammars has shown practical results this last decade in medical interventions which address perceptual or communication difficulties or in nascent machine operations which use natural language for input or output.

This negative claim (that phenomenology is inappropriate for studying FL) is most likely due to the idea, in phenomenological terms, that abstract associations may be treated as a type of metaphor which does not exist within a properly ontic region, that is, they aren't real in the same sense that physical objects and events are real. More obviously, language processes are swift automaticities not readily decomposable by conscious inspection. Just bringing about the awareness of the roots of the etic-emic distinction so often quoted in undergraduate humanities courses (e.g., how the distributional variance or phonetic realization of a phoneme such as /t/ into a voiced /d/ or an unvoiced /t/ depends upon a ‘psychological’ context) can demand some considerable effort, and yet we can effortlessly perform such operations tens of thousands of times each day. Our tongues can easily produce about twenty-five discrete muscle shapes per second in the vocal tract, all perfectly recognizable in all their gradations of phonetic realizations as proper tokens of a small set of phonemes. Four year old children can use modal
auxiliary verbs such as CAN and MUST in a consistent and correct way that philosophers of language still have trouble defining after decades of serious analysis. This is no revelation, for we know how to do many more things than what we are conscious of. These concerns move quickly to philosophical matters beyond the scope of this work, but it is clear that FL expresses a reality which we use overtly and causatively every day, bringing about events with others, building physical objects, and much more. In order to proceed, it seems reasonable to place these relations and objects in the domain where numbers are argued to exist — perhaps call it a weak form of platonic ideality, or some social and consensual symbolic world — and the matter can be left there. “Ideal entities are not real either as acts of the mind or as things in the world, they are wholly correlative to experience, a phenomenological and not a physical kind of reality” (Edie, 1987:28).

Phenomenology begins from the premise that the individual only has consciousness and perception, and never makes contact directly with the outside world except as mediated through the body. In this way then, there is no direct access to the outer world, except as mediated through differing types or grades of perception and subjectivity. Attending to meta-categories for natural language means attending to ideal consensually-labelled entities and relations, thus reducing the relativist aspects of subjectivity. The focus here is on (such allegedly platonic) forms, which, though they may not be quite as coherent and independent as integers or numbers, they are nevertheless not idiosyncratic fantasies. The parts of speech are not perfect categories — verbs particularly are rather suspect compound things — but these naturalistic FL descriptors have been working since the onset of written history. Contemporary grammars are yielding better definitions. These forms themselves do not have causal properties, but when taken aboard by living human beings, or encoded into machines mediating potentials of mechanical or electrical force, they sometimes seem to be close. The enactive mysteries of learned (or installed) meaning and intentionality — duplicating and invoking; referencing and purposing — take place. Under this view, language study has always been an intrinsically phenomenological exercise, and modern language theories are disciplined phenomenological reductions. In decomposing sentences into smaller constituents, better and better primitive categories are put forward by linguists, rather like evolving elementary particle theory without heavy equipment. The historical evolution of the disciplines that fall under the rubric of FL shows how robust subjects grow from the determination of better and better primitive categories.

Systematic connections between language elements are usually categorized by an ascending strata of phonology, morphology, syntax, semantics and formal pragmatics (rhetorical structures that can extend beyond the simple sentence). Boundaries between these disciplines do not always hold and some speech phenomena such as noun and verb inflection and agreement, or the pointing of pronouns, extend across these strata. And meaning saturates everything as the binding which generates the differentiation of primitive elements. No particular theory of semantics is expressed here — a contemporary notion of
meaning as instances of distributed regularities will be used — and problems associated with meaning
will be skirted whenever possible in order that forward motion be maintained. The functions of tense
and other operators that contextualize or ground pointers to propositions and substantives are of
primary interest. The category-relations or regularities of these basal syntactic functions are explored,
as the etymology of syntax ("with order") suggests. A parallel with arithmetical operators and
operands has already been formalized by Chomsky. Functions such as tense are treated as grammatical
controls that operate over the domains of the names or objects found within the constituents of sentences.

Traditional grammatical categories are adopted, with some focus on how decomposed categories break
down into doubly-branched structures. Structuralist (as in Levi-Strauss) and computational approaches
have achieved uncontested success in treating social and mentational activity as binary — that is, as
dual complementations — although some natural language phenomena are highly resistant to this
treatment. But perhaps it is not possible that structures could present more than two choices at a time,
since we can only deny or accept items one at a time, and not two out of three (or more) simultaneously.

This is an appropriate place to insert a disclaimer. There is no attempt here to develop new
formalisms. Existing introductory FL provide all that is needed. Foundational work from centuries of
mathematicians, logicians and grammarians, most particularly Noam Chomsky and Gottlob Frege,
have already provided a legacy of categories that sustain a growing congruency of language with
cognition. No one today holds the excessively scientistic claims such as George Boole’s assertion that
"the laws of logic are the laws of thought", but there is some shared territory. This work simply tries
phenomenology onto FL to see what some syntactic forms look like under the method. There is a minor
innovation in the treatment of Chomsky’s notion of inflection which is used in order to arrive at a
slightly atomized description of modality.

This small excursion might be weakly analogized with the basic act of the calculus. Such a claim may
be too simple to accept: it says that a core operator in infinitival forms is related to modality as the
operation of infinitesimals is related to derivatives or the calculus. Such reckless application might
call up Bishop Berkeley’s complaint about the sacrilege (or category error) concerning the worldly use
of infinitesimals in calculus as “the ghosts of departed quantities” (Davis and Hersh, 1981:244): the
making of named res extensa by grounding their invocation in non-finite operators. But such description
breathes together with semiotic notions of rupture or ekstasis which properly follow along with some
kinds of modality, and indeed, conceptualizations for modality map onto an explosive profusion of
cognitive phenomena. And after all, these are the non-finite modes. Reification is sometimes
presented only as a error of reasoning. Yet reification (hypostatization, thingifying) not only creates
enduring fictions and cultural artifacts (for instance, what is money?), but also maps with FL and its
frequent successful efforts in capturing the natural world. FL is painterly, abducting images from the
seemingly ungroundable outer reality back to its own utterly disjoint world. This is a problem for
philosophy again, with a long intellectual history, whereas this research focus is only to conduct an
exercise in constrained phenomenological description, and not Husserl's huge task of establishing the
first science (a positivistic ground for the subjective; the Kantian a priori conditions of possibility for
knowing anything) but instead a junior exercise in applying phenomenology onto restricted aspects of
language. Consequently, it is also reasonable to constrain this research to formal refutable descriptions,
to use the knowledge handed down in textbooks, and to try to evade potential confusions from the
volatility and subjectivity delivered by meaning and metaphor (although for the sake of seeking
parallel aesthetic support in arguments, perhaps metaphor might be permitted from time to time?, so
long as it is not used to mask any targets). Coordinate with this intent, I also wanted to write about FL
syntax in as physical a manner as possible, as that too seems a proper and phenomenologically-
compliant stance fitting to a neophyte's efforts to make practical use of transcendental phenomenology.
Otherwise, Kant's transcendental too easily merges into the transcendent.
1.4 Relevancy of research

How does seeking formal models for expressing intentionality relate to other surrounding problems?

Intentionality is of interest as it occupies an apparently central and 'natural' position within any foundational sense of what it is to exercise personhood. It is "the main phenomenological theme" in describing the "general structures of pure consciousness" (Husserl, Ideas:194, 222ff.). Definitions frequently fall short of desirable rigor at this point and a loose resort to metaphor might be permitted: the engine of consciousness, the light of sudden intelligence, the spaciousness of understanding, the timelessness of a memory or idea, the force of a theory, the gravity of a situation, and, for this research, the power of speech ... Under the approach to intentionality taken here, I assert that there is a commonality underlying the appearance of such metaphors, which may be made more visible by intersecting the formulations of the foundational character of intentionality from Brentano and Husserl (and the interpreters of that tradition), with the functional categories that follow from Chomsky's linguistic theories.

Intentionality poses problems in discussing it coherently. Ineffability frequently intrudes, or tracts of sophisticated epistemological discourse are brought to bear. Dependence on metaphor can be seen to follow from this difficulty. Syntactic approaches provide a window, albeit still a rather dark glass, for enabling a very narrow part of this problem, if not susceptible to inspection, then at least a little more effable. There is no pretense to providing adequate explanation for these questions, but careful descriptions of FL events and behaviours which seek both confirmation and refutation, vetted by contributors found through action research, subjected again to reduction and query, these actions applied repeatedly should permit a description of narrow aspects of the problem.

Because of the centrality of intentionality to a host of supporting and contingent constructs that have been in numerous academic disciplines, there is some difficulty in restraining conceptual offshoots from swamping the research focus. Chapter Two provides some context for this, so that they need not be further addressed except in concluding discussion. Additional to the problem of MEANING, there are other precursor notions that seem relevant to the topic but which must be ignored:

- adjoining philosophical problems concerning free will or personal autonomy and philosophy of mind, problems with dualism and other rigid dichotomies (subject-object, noun-verb, state-process, etc.);
- concerns about the ontological status and validity of basic constructs in FL notational systems;
- finding actual boundaries for phrasal categories and the ineluctable leakiness of such categories;
- philosophical and psychological positions regarding theories of perception, knowledge, sense-data, representation, realism, cognition, et al.
Such matters can not receive attention due to thesis and my own limitations, despite the fact that these engender considerable academic interest. FL provides established givens which are amenable to a few minor interpretations and generalizations. Husserl provides an essentially syntactic assertion for a relationship between intentionality and reflexion. Adjoining material will be touched upon when it is particularly relevant to the general goal of describing English verbal modality.

As noted earlier, this thesis began as an examination of the process of asking questions and obtaining answers. It began as an idea about a public examination of what it is to do electronic research and examining what I would like to learn more about concerning the formation of good questions, and the determination of whether the answers that return from the oceans of information are worthy of attention. It was to be an examination of the conduct of electronic research in the humanities. Despite the fact that the research focus has devolved to a narrow focus on intentionality and modality, traces of those interests remain.

I am interested in the examination of representational formalisms in the context of education in science. From the original interest above, I thought that this would entail an examination of the research process comparing computational tools with more traditional ones. This goal readily slid into becoming a how-to manual for academic research, something immediately out of date due to the extraordinary flux and growth of the Internet. The questions which had met my criteria for academic worth, lack of ambiguity, and personal interest became preëminent, not as embedded probes to profile electronic research, but as their own enterprise.

Though I like to think the issues that follow are just a little model for an aspect of syntactic expression, I am conscious of the naïveté of this view. I am conscious of an enormous intellectual heritage which looms over this little thing that I'm interested in. There are numerous relevant epistemological stances that need careful attention. When the Vienna Circle formed in the 1920s, Ernst Mach was acknowledged as their basic guide and its outer public body was called the Ernst Mach Verein (Society) in honor of the wide and respected influence that Mach had upon the philosophers of that era (now seen as the progenitors of positivism). When trying to decide upon the philosophical stance for this research, I was confused by conflicting notions of phenomenology, empiricism, qualitative and action research, all of which I seemed to be adopting, inconsistently, in this research. In the philosophy of science, Mach is seen as a principal progenitor of modern empiricism, and yet his own philosophy receives the label “sensationalism” (as with Hume and Mill) due to his assertion of the primacy of sense-data in theory construction and his careful examination of sense-bound psychological factors underlying scientific understandings. An early (and extreme) research goal for this project was to see if a syntactic representation for intentionality might be constructed, to see if some kind of intentionality might be usefully framed as an isolable quale and argued as a ‘felt’ propositional force with respect to
the generation of English modality. Mach is called an extreme positivist, and yet the depth of his thinking (viz., careful distinctions about sensation and perception, arguing against absolute views of space and time, outstanding physical measurements) opened up many questions for philosophers and scientists who came after him. He might be seen as a progenitor of the kinds of syntheses that led to Einstein's or Heisenberg's relativistic positions. Whether one is a radical constructivist (of a world-is-mind or anthropocentric flavour) or a strict materialist, Mach helped to frame the difficult problems. Positioning Mach at the forking of positivism (leading to behaviourism) and phenomenology (leading to a cluster of post-modern analyses) seems to have some merit.

Figure 1.3 Positivism and phenomenology follow from Mach.

In this rich intellectual environment, Husserl encountered formal approaches to perception and arithmetic under Brentano and evolved his phenomenology forward on the transcendental apparatus of Kant. This century, after the development of positivist analytical philosophy, during the reign of behaviourist social science, researching a notion like intentionality was essentially impermissible, at least in North America. Some credit Chomsky's 1959 rebuttal of Skinner's *Verbal Behaviour* in the pages of the journal *Language* as one of the key events in the demise of behaviourism and the onset of contemporary cognitive science. Reflecting on the science associated with modern language theory, a methodological relationship of the sort glossed above makes some sense. This accomplishment is Chomsky's more than any other, but it is also the legacy of thoughtfully applied structuralism following de Saussure, Claude Lévi-Strauss and Leonard Bloomfield and many others. The last three decades of explosive activity within the semiotic and hermeneutic enterprises is a complement to these positivistic descriptions. It is no new observation to say that opposed theories exhibit a dialectical interweaving — theories are clearly much made by what they reject. Positivism has a great deal to offer, and it would be undesirable if some of the contemporary rejections of empirical and mechanistic science were to effect a dismissal of valuable methodologies and approaches. Simultaneous with interest in early German phenomenology being expressed in artificial intelligence circles, I observe some persons arguing quite powerfully about the values that the (often popularly despised) Skinnerian approaches have to offer. An effort to frame intentionality within FL syntax invites such a unity of perspective.

† Perhaps the earliest beginning, knowing nothing about grammar, was a sense of wonder about how it is that infinitival structures (specifically, perhaps, infinitival to) controlled the breaking out or rupture of verbal reference, and yet could still (in some denotations) be semantically empty. This seemed very strange.
If, as a result of the probe questions, bibliographic research and interviews with academics, the constructs under query in Chapter Two and Three stand up, then the value of this research lies in:

- comparison of different research media (they are utterly different from each other: some specific values of electronic communication for doing particular kinds of research; the many aspects in which face-to-face communication is superior; and how print media retains indispensable values);
- determination of the validity of mapping Husserlian intentionality onto FL structures;
- how this mapping assists a description of some forms of modality.

An active interplay is present amongst conceptual domains which interact in aesthetics and design:

- the interpretation of the Husserlian constructs of intentionality and reflexion;
- the intentionality and reflection of the action research cycle;
- the intentionality within grammatical inflection and FL expressions.

This interactions can be seen both whimsically and as constructed formalities. This may not be a good note to strike as a thesis stance, but I am frequently reminded of Eugene Ionesco's counsel for dealing with issues that inspire grave tones and respectful bows: advice, approximately, that serious things themselves are the least deserving of (and perhaps worst served) by seriousness. Particularly, this is true here because, though I wish to describe a commonplace event which we all partake in, I would normally be prohibited from such an engagement since it properly requires the formal methods of a Chomsky, a Bertrand Russell or a Rudolph Carnap.
1.5 Research questions and summary

As noted at the outset, the work studies internal form from within FL structure to determine if a syntactic representation for intentionality can stand up to formal examination. The research questions below will not be fully defined until Chapter Three.

Research questions:
Q.1 Is the construct [ intentionality [ reflexion ]] congruent with Husserl's notions?
Q.2 Is there a coherent relation between grammatical tense (verbal inflection) and intentionality?
Q.3 Is it coherent to assert dependency between objects like [ infinitesimals inf₁₀ ] and modal expressions?
Q.4 Is the rule \[ M \rightarrow [ Tns \ V \ inf₁₀ ] \] acceptable in decomposing an English modal auxiliary verb?
Q.5 Is it false to maintain that a denotation for infinitival to can be semantically empty?

The research questions would seem to allow YES or NO answers which would reflect the belief stance of a reader. If a question is answered affirmatively, then supporting findings will be summarized in Chapter Four. Negative results will be presented in the same fashion.

The next chapter is titled "Intensions" for methodological reasons. During the course of data collection, perhaps a dozen persons interpreted my queries about intentionality to mean that what I was really interested in, or properly should be interested in, was intensionality. Intensionality is about the having of intensions or meanings: that is, the apprehension of, the consciousness of, or the holding of, ideas about something. Intentionality and intensionality are thus synonyms for some persons. Particularly for behaviourists (materialists, physicalists), intentionality seems to be seen as intensionality. Clearly, the notions are related since objects in attention involve precursor events, volitional or not. In these pages, the stance taken — and I believe that such a stance is not merely an arbitrary position — is that this is something like the difference and mutual entailment of a process-state relationship. This intertwining is a commonplace; teleological elements (ends and means; actions and results) can be endlessly tangled up. In obvious terms, doing thinking means having thoughts. More relevantly to this research, nouns morph into verbs and back again. Husserl uses the term NOESIS for acts (the acting) of consciousness and NOEMA for the objects or apprehensions within those acts (from the Greek nous mind; noesis thought). The term INTENSIONS serves in the following chapter to represent phenomenologically-oriented constructs of a very simple syntax. Under this perspective, syntactic categories are noematic objects; they are intensions about entities and relations in FL-bound noesis. This isn't intended to be purposefully slippery, only to highlight that relations are constructor objects (that is, definable intensions) for a foray into the most simple of beginning syntaxes.
Chapter Two outlines a groundwork which is then extended into narrower particulars in Chapter Three. Sections 2.1 through 2.4 are intended to fall within the Husserlian method of formalized contemplation, with the qualification that simpler language and constructs are used to look at the basic or formative syntactic relations that must be in automatic use in the understanding of speech or in reading a page. This has its origins in a design begun in looking at FL aspects of a basic science curriculum. I was encouraged by the content and title of Honda and O'Neil’s 1993 article, *Triggering Science-Forming Capacity through Linguistic Inquiry.* My reading of Husserl’s agenda is that an epistemological grounding for basic FL constructs properly belongs to a transcendental phenomenology of scientific expressions. The address to FL that begins in Chapter Two is suggested in the content of Husserl’s Ideas, Chapter 1, §12, *Syntactical Objectives and Ultimate Substrata, Syntactic Categories.* In the context of curriculum approaches, I thought it appropriate to use existing constructs to look at elemental operations of bracketing (ordering and associating) grammatical elements in order to begin a foray into some FL syntax useful for talk about intentionality and modality.

† This article is one of only a handful that address methodologies of contemporary generative grammar applied to the classroom. This seems unfortunate as such implementations provide an opportunity for constructivist-style discovery techniques, for direct experience of the scientific method (at very low expense) and for the discovery and appreciation of some formal mechanisms from natural language. Honda and O’Neil give a sample of what an alternative ‘lab’ experience could be like.
This chapter outlines a sequence of relation-oriented intensions (that is, definitions for base syntactic constructs) for what Husserl calls **syntagmata**. These comprise a four-part conception of basic aspects of FL syntax, endeavouring to organize such relations sensibly within a phenomenological perspective. The first section begins with the richly ambiguous notion of object. After that, three more sections describe relations between such objects which might be used to 'get to' modality. All of these notions already have multiple instantiations in various forms in extant curricula.

### 2.1 Object

These pages address the objects\(^1\) underlying words — parts of words; groups of words — perceived as a linear stream. Such categories act as building blocks for larger structures of language. Some language phenomena deny this linearity, and the fact of internal hierarchy or structural ranking between some pieces of language concerns the control structure in §2.3. The act of reading is not at all completely linear, whether due to the saccadic motion of the eye or acts of scanning. Reading entails breaks, repetitions and holisms, but the production of text (as product of an author's pen or keyboard, or as spoken by a reader) devolves adequately into a perceived or perceptible stream of objects. More obviously linear is the hearing another's voice in your ear (longitudinal waves of alternately compressed and rarefacted molecules of air) or the tuning of a broadcast signal by mechanical means (then transduced to optical or electrical conduit). Psycholinguists comment on how we can "tune" a single speaker from a room filled with voices. We can hear all the sounds when many persons talk at once, but we can only attend meaningfully to a single voice at any given moment. Grammatical categories or the labels of syntagmata name the objects in that stream.

The received objects named with their framing syntactic or rhetorical category (rhetorical in its founding sense as the rules for discourse) are used here as free of content\(^2\) as possible. To claim to divorce content from form is fundamentally naive, egregiously in the case of language, but may be seen as a part of the stance of realism found in phenomenology. Cast into critical or scientific realism, I accept the object names in the categories of Table 2.1 (below) as an adequate capture or fit with language. There

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\(^1\) Henceforth, the word **OBJECT** is only used to reference the syntagmata or tokens of Tables 2.1 and 2.2 1.2, including the familiar notions of a verb’s subject or (direct or indirect) object. These are all syntagmata, transcendental in an "authentically Kantian or Husserlian sense: namely the search for the necessary conditions of the possibility of something being the case ... on the level of the formal analysis of meaning structures" (Edie, 1976:36).

\(^2\) Such an effort seems like a good first stance to adopt, and was pursued under Chomsky’s goal of an “autonomy of syntax” from semantics (Chomsky, 1980:126, 246). This effort failed as there are syntactic categories, such as articles and pronouns, which entail non-adjacent semantic relations. In some senses, syntax is semantics or expressive of logical relations. Theory is growing better able to combine these but gaps remain.
are many ramifications to this simple representationalist hypothesis: as an axiom of artificial intelligence (that symbols named in programs enable reasonably truth-bearing and causative relations with the world), that the many thousands of words of discourse you hear and read each day are coherent or correspond asymptotically somehow with events and things of the world, or that the representations found in the equations of science and mathematics maintain an adequate hold, everywhere. Table 2.1’s objects are assumed to point generally towards some kind of a silhouetted psychological reality. Although some grammatical categories that appear unreliable — adverbs are perhaps the most prominent — these objects are accepted simply because they have met a functional criteria of use. Chomskyan grammar since 1981 has forwarded increasingly better internal constituents for decomposing the compound bodies of the central objects of nouns and verbs. Such categories are used in Chapter Three.

**Types of form:** tokens (syntagmata)

**modality:** (see list in Table 3.4)

**statement parts:**
subject, verb, object, topic, focus, theme, predicate, clause, figure, ground

**phrase grammar:**
noun, verb, determiner, quantifier, adverb, adjective, conjunction, preposition, pro-forms for { CP S DP NP IP VP }
(thesese are mostly categories for words)

**morphology (word parts):**
base/stem, affix (pre in post), stress, tone

**phonological / phonetic:**
syllable (CV) and stress information, phonological characterizations or features

**semiotic:**
metaphor, simile, litotes, chiasmus, hyperbole, metonymy, personification, synecdoche, ...
(many specialized tropes could be listed)

**miscellany:**
Other rhetorical or compositional categories could be added or developed, including larger object grouping that describe genres, etc.

Silence is also a form, albeit rather special. It holds relations with the written operators of punctuation: { -- , ; : ! ? ' " ' " " ... } etc. or the morphological features of stress.

Other orthography and diacritical markers are also omitted (such as { % $ } and { ° A } etc.).

Table 2.1 Examples of constructive forms

Since the forms given above are formal language terms applied to natural language, other components of FL are missing. The notes ending Table 2.1 indicate some further complexity that is omitted. For mathematics, logic and computing languages, the array of forms is much simpler since these have been constructed by conscious rule, an alien situation compared to that of natural language. Paradoxically,
many persons find these other “clearer” FL harder to use — note the frequent phobic reactions to science, computers (less so now as more children grow up in a silicon-infested homes), logic, mathematics and other formalisms. Thus for FL, with the metalanguage for natural language excluded, we see a smaller, well-defined set, including:

| operators: | (+-×<>≤≥±≡≡ √ | ∑ n ∏ c₂ ≤ z e e ← → + - ^ v = 0 v 3) etc.; |
| paired brackets which point to expressions, e.g., (), {}, [], < > and others. |
| operands: | variables (free, or bound within the scope of other external operands); |
| any object within the infinite membership of the number line; |
| other kinds of numbers (imaginary, transcendental, Cantorian, etc.); |
| expressions (operators and operands together expressing single objects contained within brackets or parentheses). |

Table 2.2 Some FL tokens not in the FL of natural language

In Chapter Three, only a few of these forms will be examined and they will be differentiated into something like the operands and operators above, a distinction akin to the dualistic relations of state and process, object and action, noun and verb, form and function, and other similar pairings.

In natural language, the Table 2.1 objects indicate the separations of the continuous stream received by the body. Just as in the white space and punctuation between words on this page, an aural stream has, in addition to silence or juncture, phonological subtleties which indicate word boundaries. No theory yet provides a reliable definition for word (or for syllable or phoneme) and yet, we know how these are constituted. This imposition of discreteness is foundational, otherwise infants could not resolve the Joycean “blooming, buzzing confusion” around them and join into the fellowship of verbal behaviour with the rest of us. Words have their own shapes or boundaries established somewhere before overt consciousness. The object acts as a vessel for meaning, but in between it is meaningless, nonexistent qua word. It is only disturbance in media, unless we grant telepathy or some ultimate ground for language users to draw upon. There is no message in the medium in this sense.

Central to this chapter, please note that when the word object is used, these grammatical categories are meant, not the content notion of a word. These objects function as controllers, or as an objects controlled, in the incoming stream of code. Without such syntactic relations (which necessarily link with the reality of reference entailed by grammaticality) the construction of meaning would not occur. It would seem inviting to stray into mysteries about a universal grammar or innateness or language acquisition, but the following chapters simply assume our exercise of grammatical knowledge as a constructive capability. The scope of this work is restricted to describing how these objects might be seen as controls with respect to English modality. I assume that these objects are simply operational

† Looking up SYMBOL in the Oxford Encyclopedia of Mind, find Quine’s comment on a suggestion that Locke “would have done well to write ‘word’ in place or ‘idea’ throughout his [An] Essay” [on Human Understanding]. In these pages, the words FORM, SHAPE, OBJECT and STRUCTURE will evidence a fairly promiscuous interchangeability. The word OBJECT will receive the most formal treatment as it instantiates the categories listed in Tables 2.1 and 2.2.
within the brain without any claim about how they happen to be there, or any other ontological considerations. The existence of these objects, applied routinely with other percepts into the body, whether by ingestion or construction, seems appropriate as a domain for phenomenological approaches.

The graphic in Figure 2.1 is not particularly truth-bearing. It is only intended to evoke the packaging or enveloping of the (meta-)categories of language use. It is a compacted trope, clearly a built and not captured, image of a speech stream. It could be the decoding of pulses in a telephone wire or a selected satellite transmission. It began as a pipe metaphor from the capacity of computer operating systems to pipe processes into other processes or in the capability of certain programming languages to use Alonzo Church’s lambda calculus and instantiate what are termed first-class objects so that a program will readily accept not only regular data as input but, freely, other programs as well. This pipe metaphor has in the last decade received greater currency as the bandwidth of the old Internet has widened such that it now has the capacity to absorb many other types of media in addition to unadorned text. Even if aspects of this pictorial representation were bettered, much remains wrong. Other information conduits are intrinsically busier: video (a conflation of multiple foci into every one of twenty or thirty frames per second), some methods of reading, the complex tapestry of simultaneous threads in music, the gestural complexities of face-to-face communication, or meanings, seen as the presentation of multiple voices in a single message (notions such as Bakhtin’s polyphony, or Kristeva’s intertextuality), etc.

A useful amplification for Figure 2.1 would be to see it as a small segment sliced from Reddy’s Conduit Metaphor (1979:284-324 passim). Reddy gives an insightful and rich set of examples and comments on our propensity to perceive meaning as being contained within words, what he labels “patent nonsense” and a “bizarre assertion”. Undeniably, there is an “external physical pattern of marks or sounds [or waves or particles] that do pass between speakers” and other communicators (ibidem:290), but meaning should not be literally seen as present in such marks. The earlier stress away from content is thus particularly appropriate under this perspective. The marks and gaps do evoke semantic knowledge of course, but the present focus is on the syntactic character of the categories in Table 2.1.

Many textual figures, take metaphor again, deliver their effect by presenting at least two things at once to the percipient. This affect or tension can probably be found in the base essence of any word or symbol, thus the frequent and carelessly used idea that all language is metaphoric, or that any picture or map is a metaphor. But these more figural objects again inject substantive issues of content which distract from the fairly strict denotations (the base idealized form) meant here by FL objects, the syntactic husks of some of these forms. There may be no meaning ‘out there’ beyond the body but there certainly is an excess of latent syntactic potential for embodying new pattern and order.
Taking Locke’s view that the two sources for ideas are *sensation* and *reflection*, then clearly these objects fall with a notion of reflection. In Chapter Three, some objects from Table 2.1 will be recast into a more formally Husserlian context which echoes Locke’s assertion. Viewed under a classic construct such as the semantic triangle (original in Ogden and Richards, 1923) our apprehension of words may be seen as a persuasively triadic relation, a characterization applicable to any term from Table 2.1.

![Figure 2.2 Original form of semantic triangle](image)

Almost a century ago, Ferdinand de Saussure ended 2000 years of discussion about the relation between a word and the thing represented. That relationship is *arbitrary* (with the complicated exception of the miming present in onomatopoeia). We construct the relation (otherwise the word is mere blank or confusing buzz in the pipe). Ogden and Richards dashed the line between *NAME* and *THING* to show this tenuousness. The simple assertion is that names invoke things. Once we learn the name, the thing is presented as a fact of normal discourse. In the extreme, there is also word magic and linguistic taboo and a variety of convoluted theological practices; proper names pose special problems; conventions dictate that voicing certain words concerning acts of religion, hygiene or genitalia is prohibited. The connection is so strong and immediate that we may act as if the thing named is here presented in the flesh. The two un-dashed lines, from *NAME* through *SENSE* to *THING*, in Figure 2.2 make the real transit, yet so literate are we, that this is mostly noticed. When we know the word, its meaning is integrated into consciousness seemingly instantly, by processes beyond any conscious purview. There is little possibility that we can penetrate into such events by adopting a phenomenological stance — better hopes lie with neurology — but Husserlian phenomenology conduces observation at a meta-level where received forms can be bracketed and seen to interact. Indeed the first use of a formal notion of “metalanguage” begins with Husserl and Frege.

This useful construct, whether called the semantic or the semiotic triangle, seems a rather neglected pedagogical tool for aiding perceptual clarity with language. For instance, by sharpening awareness and the distinctions (confusions) between words and objects, it might provide some aid to reasoning skills or in vaccinating against the addictive and propagandizing effects of media. Numerous thoughtful elaborations can be found (q.v., the works of Charles Sanders Peirce or Charles Morris) but

---

† No attention will be devoted to interpreting different senses of *NAME*, *SYMBOL*, *CODE*, *WORD*, *NUMBER*, *EXPRESSION*, and the like. These things are viewed here as elements which reside in matter: as carbon on this page; as aggregations of photons or electrons; or even as boundaries when letters are carved away from granite. There are important distinctions between such things as *SYMBOL* and *CODE*, but they are not a part of this work.
its fundamental triune conception remains simple, sound and a sometimes splendid device for helping to untangle the subtle and frequent faulty identifications and reifications that arise between words and things, or between (±)representationalist stances and putative realities that concern this research.

![Semiotic Triangle Diagram]

**Figure 2.3** More versions of semiotic or semantic triangles

The exigencies of textual representation hide transparently obvious falsehoods in the above graphic. The ‘definition’ corner with the words meaning, reference and significance really is something much more profound: a notion of distributed regularities was mentioned previously for the shared pattern of usage deeply embedded in the interweaving of words interacting together. Perhaps no referend properly has anything like a boundary or limit. The echoes only die down. More obviously, the bitten apple at the right (instead of a deposit of graphite or an absence of excited phosphors) should really be:

A. an actual genuine fleshy apple (a tasty, often prized, latently living thing, filled with complex carbohydrates and micro-organisms, a member in the food chain, etc.), or,

B. the neural correlate — or associated mentational object, if dualism is preferred — which instantiates individual or cultural ideality, or the underlying prototype for all past and present tokens of type [apple] that a language-user(s) can speak or write.

When a word denotes some physical thing, the situation is at least partly straightforward. What a thing is, is something quite beyond the scope of this work (and phenomenology in principle) but in practice, we have little problem with naming things and finding consensus to license that naming. But, when the name is an action or process — that is to say, when some referend implies temporal extension — then other problems intrude. Such problems are multiplied again when the naming concerns non-physical ‘things’ (devoid of matter or energy in space and time) such as justice, the good, beauty, or numbers, or the clear, powerful and foundational feelings associated with emotions and desires. Like syntactic relationships, these occupy a seemingly naturalistic state since, at least in part, they arise in our communicative interaction with the world, and exercise a proper fit and grip upon the environments we use them in. Husserl would assert that any aspect of language is of this character. Edie (1987:28) says Husserl’s response to the charge of Platonism in his “theory of the ideality of language” would
never assert that these namings and uses are real "either as acts of the mind or as things in the world; they are wholly correlative to experience, a phenomenological and not a physical kind of reality."

The ugly scientistic feel of a phrase like distributed regularities can instead be seen as an expression of human experience and felt as a living weave of cultural exchange and activity.

Use of any referend entails a physical event and thus a correlative phenomenological moment or substrate. Paradoxically, language expressions for noema about emotions or cognition have the most insubstantial of referents — processes associated with a moment of creation or subterfuge, the state of the body or of memory that leads to an attitude — yet these are foundational to what is to be alive. These idealities can become frozen for a lifetime, whereas the conceptualizations of what a chair or what justice is, can be quite evolving and malleable. More stable yet are the idealities associated with FL objects. William James called our ability to produce repeatedly identical constructs “the keel of the mind” (Edie, 1987:10). Edie comments that the “concept of sameness is so fundamental to our mental life that it is quite impossible to find anything more primitive” and that “Plato recognized it as a more fundamental notion than even the ideas of ‘being’ and ‘nothingness’” (Edie, ibid.). He discusses Husserl’s concerns with grammatical distinctions since these, along with other FL objects, embody the purest (the most formal) ideality of any other perceptions or referents. It is this ideality that allows such perfect identity and repeatability. The number two is always perfectly the number two. Trying to argue for the same iterative character for chairness or justice is plainly impossible, as those conceptions evolve and change. FL objects are the pinnacle of ideality.

Following Ogden and Richards, a word for a grammatical token could be decomposed into a trichotomy. A key item for Chapter Three, inflection from Table 2.1, is exampled below.

The objects in Table 2.1 and Figure 2.1 are devoid of substance, but they do have a familiar consensual, consistent and public character. The question marks in the referent positions in the Figures 2.4a and 2.4b mark the noetic difficulty. Should these be comprehended as the A-type referent from the prior discussion about [apple] or should these be assigned to the abstract (ideality substrate) B-type?
Inflection surely belongs only to the B-type world of ideality. Inflection is addressed as the second definition in Figure 2.4b (as tense or aspect) in Chapter Three, and as such, both logical and grammatical theories treat it as the central ground and boundary-maker of the sentence. (Again, companion with the grammaticality footnote on page 2, the sentence-gestalt is the ostensible wielder of cohered or coherent thought.)

The centrality of the sentence as a complete thought or coherent relation makes it a containing frame for the objects of Table 2.1. Beyond the sentence begin other disciplines such as pragmatics or rhetoric, but syntax is charged with determining the boundaries of the sentence since it directly encounters sentences linked directly to others by relative pronouns and subordinate and coordinate conjunctions which embed sentences into compound sentences. Further constructs for addressing sentences follow in §2.2 where concerns are extended to sequencing the objects of Tables 2.1 and 2.2. Poorly defined and categorically leaky as these are, they must be something like what we use to break up the incoming noise into referents that we know. This is also to say an obvious thing: order before sense; linear order is already extant in the external signal. Referent recognition requires more syntax than just the sequence of the next section ... there is hierarchy or rank order too, so the notion of dominance addressed in §2.3.

In the following pages find the first and simplest operation applicable to the objects of Tables 2.1 and 2.2. Later sections increment two more overarching forms, and outline an uncomplicated description — a phenomenologically slanted syntactic primer that may be better handled by de Saussure's approach — for how some basic aspects of FL accumulate forms upon forms, and then facilitate other operations.
2.2 Sequence

The last section outlined the phenomenological objects of this study. This section addresses occurrence of such objects with companion objects from Tables 2.1 and 2.2, marking that occurrence with square brackets. Such sequence is no more than association.

Objects surrounded by square brackets are asserted — by dint of this bracketing — to belong together, to be related by some (often unspecified) category nature, and (in a default reading) to be at the same level or rank. This is a common textbook convention, but is conflated here with other disciplines that are a part of FL. This is the fourth typographic convention from §1.1, and merely indicates the means by which a group of objects is sequenced and associated together. Consequently, the brackets may be named and perceived as another enveloping object, identified as a token expressing a different category nature.

In Chomsky (1957:26, slightly modified below for typological compatibility), a paradigmatic base sentence is described as first decomposing into a noun phrase and verb phrase, and then to familiar parts of speech and the individually realized words.

\[
\begin{align*}
2.2.1 & \quad [S] \rightarrow [NP \ VP] \\
2.2.2 & \quad [NP] \rightarrow [T \ N] \\
2.2.3 & \quad [VP] \rightarrow [V \ NP] \\
2.2.4 & \quad [T] \rightarrow [the] \\
2.2.5 & \quad [N] \rightarrow [man] \quad (\text{or [ball], etc.}) \\
2.2.6 & \quad [V] \rightarrow [hit] \quad (\text{or [took], etc.})
\end{align*}
\]

This arrow (\(\rightarrow\)) is not the arrow of logical inference but more like the arrow used in chemistry to indicate a decomposition, except in this case it is more a realization, from the old notion of deep structure or grammar becoming manifest as surface structure. These have been called rewrite rules. Chomsky (ibid.) says “we interpret each rule \(X \rightarrow Y\) as the instruction ‘rewrite \(X\) as \(Y\)’.” Husserl’s roughly equivalent term was “reiterable operations” (Edie, 1987:51). Regardless of the formulation (and Chomsky, now forty years on, has carefully developed increasingly sophisticated theories) some profound mechanism is at work in managing underlying syntagmata into recursive and infinitely generable capacities found in language acquisition and speech and writing production and recognition. Now the term phrase structure rules is used more often. These have been increasingly abandoned in contemporary theory in favour of more constrained principles, but they haven’t entirely died away and are still found in many places due to their ease of use and coherent expression. We can label the

\[
\begin{align*}
\text{\textsuperscript{†} But, if philosophical support is sought, there is Aristotle, for whom association was as a central doctrine of understanding the mind, or with the British and Scots empiricists, notably Hume on causal relations and the arbitrariness of sequence in An Enquiry Concerning Human Understanding (1748, §III).}
\end{align*}
\]
brackets and show the grouping together of dissimilar objects into what we intuitively know is a proper association: for [white page]: [NP] → [NP Adjective N]. I don’t know the intellectual history of Chomsky’s work outside of his mentions of von Humboldt and post-Cartesian (17th century) Port-Royal grammar. Kristeva’s summarizes precursor forms in American structuralism (1989:237-249). Gertrude Stein’s well-known comment (“I really do not know that anything has ever been more exciting than diagramming sentences.”) may provide a sufficient argument that the activity could spontaneously arise in anyone.

Richard Hudson (University College, London) queried this subject, with the following assertions:

1850, USA: Clark invented a box-system for showing SVO structures and dependencies in school grammars.
1877, USA: Reed and Kellogg added horizontal, vertical and sloping lines to make these diagrams clearer, again for school use.
1929, USSR: Usakov, Smirnova and Sceptova invent a similar system for showing structural relations in Russian.
1957, USA: Chomsky invented the ‘tree’, with his one tree in Syntactic Structures.

These details come from Gleason, Linguistics and English Grammar, and Tesniere, Elements de Syntaxe Generale. No doubt I could have put in something about the box diagrams that were in use by American Structuralists before Chomsky. Have I missed anything else important? And am I right in thinking that all these ‘inventions’ (except the first two) were independent of each other?

LINGUIST, v. 6-287. 95.02.23. (Subject: syntactic diagrams.)

Two more common expressions for sentences are found below. (Other languages may use other orders, as indicated in Table 2.3 on page 32.)

\[
\begin{align*}
2.2.7 \quad & [S] \rightarrow \{ \text{Subject Predicate} \} \\
2.2.8 \quad & [S] \rightarrow \{ \text{Subject Verb Object} \}
\end{align*}
\]

The notion that a sentence (freely construable as synonymous with STATEMENT or PROPOSITION) consists of a subject and predicate dates back 2000 years to Indian and Greek efforts to perform reliable operations in reasoning with natural language. Interestingly, Brentano described intentionality as the relationship between subject and predicate, a relationship — differently from how Brentano intended it — is made more structurally salient in §3.4. The sentence structure in line 2.2.3 (and many of the tokens in Table 2.1) has its origins in Greek and Latin grammars exported up through the centuries. This forced adaptation is regrettable in some ways, since the categories don’t always fit, especially in some languages where nouns and verbs are perhaps very nearly the same syntagmata.

For the purposes of these pages, what is referred to in composition as a compound sentence is to be seen as two or more sentences, that is, an [S] is idealized and only has one subject and one verb, or one occurrence of inflection. The additive complexity introduced by conjunctions lies outside the technical domain of the sentence (most grammatical theories may be described as sentence grammars) but is captured by formal logic, albeit a capture that comprises only a scant fraction of the real performance of the different flavours of conjunction in natural language.

† A message in the Linguist List, a large moderated group serving that community. This quote is from the central body of his query, verbatim, but slightly reformatted.
Following the conventions of these sections, if two sentences are found in sequence, brackets would be included to indicate how these objects are grouped together, e.g., \([ NP \ VP ] [ NP \ VP ]\). A string of sentences linked by a coordinate conjunctions such as **AND, OR, or BUT**, since they all at the same level and all of the same type, might look like \([ S \ S \ S \ S ]\).

In arithmetic, matters are fixed by the rules controlling parenthesis and operator precedence. We only become conscious of this when we forget the rules, or are confronted with different systems such as those found in reverse Polish notation or computer programming languages where the conventions might differ. There are three standard methods for expressing mathematical formulas: **prefix, infix, and postfix**. Clearly, these equivalents 'mean' the same thing. For example, adding the first two positive integers:

- **prefix**: \([ + 1 2 ]\) (Polish notation, operator-initial);
- **infix**: \([1 + 2]\) (standard algebraic notation);
- **postfix**: \([1 2 +]\) (reverse Polish notation, operator-final).

Most of us use infix notation, though those exposed to a programming language like LISP, or calculators made by Hewlett-Packard™, may have arguments for why another form is faster and easier and more powerful. But, in a sense, the choice of notational system may be roughly chalked up to accidence. Conventions for displaying more complicated mathematical expressions could be developed, but the concerns of this work are simple and do not require such elaboration.

The English language is characterized as having the order: subject-verb-object. English generally follows this SVO ordering left-to-right with adjectives preceding their nouns. French is similarly SVO, but with adjectives following nouns (except for older common adjectives: cf. **UN BON MOT** versus **UN MOT DÉSAGRÉABLE**). French and English used to be SOV just as subordinate clauses in German continue today (German main clauses are SVO). Consequently, there are six possible combinations, just as there are for arithmetical operations, when operand order is important. (The operators for addition and multiplication act to accrete quantities and operand order doesn’t matter, but if operand order is reversed in subtraction and division, you will definitely arrive at wrong answers, even if these are symmetrically wrong answers. As with some of the preceding recapitulations of familiar facts, it seems offensive to state such well known information, so please ascribe this to expositional completeness.)
Table 2.3 Distribution of languages based on their subject-verb-object order

The preceding table (simplified from Asher, 1994:4994-4995, and Collinge, 1990:297) summarizes five surveys of language arrangements with examples of each below the numbers, excepting the rare ones, which are very obscure (at least this is probably the case if you are a native speaker of English). Typically, the number of languages on Earth is tallied at about 6000, though this number would be vastly greater if extinct languages could be included. The number of reasonably active languages today is between one and two thousand, depending on how many thousands of speakers are needed to qualify a language as maintaining an ‘active’ threshold. Percentages were mostly rounded to the integer.

As a seventh case, it may be that some languages do not have any basic word order at all: Dyirbal, an Australian language found in northeastern Queensland, may be an example of this (Malmkjær, 1991:274). The question is not simple and neither are the explanations for these distributions more generally. Language typologies and universals have painstakingly been found and asserted and remain in flux, perhaps due to the enormous amount of sheer clerical work that is required to make them salient, perhaps due to philosophical and scientific difficulties with arriving at robust categories. The distribution from Table 2.3 is graphed below to make disparities more apparent. (The letter S stands for subject in this instance.)
The last two categories of object-initial languages were only discovered in 1978, and are so far found to be restricted to language stock from Amazonia (Collinge, 1990:297-298). Again, these are crude labels and don’t adequately characterize a language for more scientific purposes. They aren’t used in further pages. This is merely one of the first, and easiest, of decompositions. We can observe the dominance of the three \([SO]\) sequences whose categories fill 96 percent of the distribution. It seems so natural that subjects should arrive temporally ahead of objects that any comment is probably uninformative.

Nothing so systematic is evident for the position of verbs. Because of difficulties with actually defining subject and object and some verb phenomena, there is good reason to be suspicious about this method of classification, even though it provides some helpful distinctions. Later sections concern smaller internal structures than these. The earlier parallelism with arithmetic is no more than an analogy about order. FL for natural languages is vastly more fuzzy than other FL, most of which are very well described and, in some cases, fully known in a formal sense. Compared with how well we understand geometries, number theory and statistics, our knowledge of natural language is staggeringly small. Until the advent recent cognitive theories, syntactic categories had developed surprisingly little from their first expressions over two thousand years ago in India and Greece.

When more finely grained objects than \([SVO]\) are used, the inadequacy of these categories can be more plainly observed. In the finding of meaning, we often re-order elements of the received stream of language — sometimes associated backwards with the previous element; sometimes associated forward with the element ahead; sometimes reaching and connecting across intervening elements to cope with pronouns — and internally template a new structure upon that linear order, a structure which may partially contradict the physical order of components from the stream. The expression of this architecture is a traditional function of syntax, or in FL generally, of rules that express the binding of variables or operands. The notion has been discussed as a psychological and physical fact about syntax since Ferdinand de Saussure’s first course in modern linguistics at the turn of this century, and probably dates back long before, in one form or another.

The constituents of a given proposition — regardless of their media or mode of transmission — have an ordering that is imposed by the syntax of that language. We know what are the subjects and predicates are, or which objects belong to which verbs because the native language dictates processing order. The percipient constructs the correct associations between objects by dint of knowing the grammar, by the application of innate (or other) rules operating swiftly beneath consciousness. The permutations are simple when only a few objects are considered. Since language is a linear stream in the time or space of its physical transmission (ignoring pictures or reading by scanning), there are only two possibilities. If a body-centric view is applied, these may be labeled a left-to-right or a right-to-left ordering, or else some variation of pre- and post- may be used. In English, we have prepositions that have become ‘particles’ and can float between following their verb or the object of that verb (to wit: *she looked up the*
WORD. versus SHE LOOKED THE WORD UP.). In poetic use, adjectives may create additional emphasis by following their nouns. Regardless of any detail, there are only two possibilities when two objects are considered: link ahead or link backwards. Should one 'direction' or permutation be stated in the following pages, its complement is also a possibility. They are received or constructed associations, necessary since the exercise of intentionality requires adjacency of object. Since this examination is language-bound the notion of this chapter is merely that directedness or object relation can act forwards or backwards in the conduit.

This capability — viewed from the syntagmatic level of words — is expressed by Chomsky and others as a notion of lexicon, which complements the basal syntactic principles of a given language, feeding other syntactic operations. Many seemingly idiosyncratic features of words then can be sorted into classes of syntagmata (that is, as typologies within one part of speech: nouns that never take singular indefinite article, verbs that never take a direct object, etc.).

This section also indicates the mundane fact that objects grouped together become an embracing syntagma when they are linked in a syntactic category. Further examples of the bracketing convention were given. There is no special novelty in the use of these brackets. They are widely in use, and serve only to further the generalization about object association within variant FL expressions. Further, they seem to be a rather literal instance by structuralist approaches to language of Husserlian bracketing. Using them in demonstrative paradigms to show judgements of grammaticality parallels the further state of eidetic reduction rather exactly: the isolation and experimental variation of objects in order to intuit their essential character. Permutations of object sequencing should not distract from any claim, as nothing hinges upon such permutations that is germane to this study. (However, they are extremely important, particularly in natural language where phenomena are not as simple as these pages may unintentionally imply.) Lastly, in disregard of object order, we nevertheless re-construct or construe their association in accord with the grammar we use. The markers for association are sometimes present in the object stream as juncture or silence, but these are not sufficient to enable the understandings a person imposes upon incoming information. On the Husserlian view, when we act in knowledge of a received object (word, referent, symbol, etc.) we are making exercise of primordial non-conscious knowledge that underlies syntagmatic categories. Anthropomorphically, words express a kind of in-built unconscious agency or mindless willfulness (and a clear lack of willy-nillyness), in how they adjoin their neighbours.
2.3 Control

Syntax must account for the fact that all objects do not exist at the same categorial level and that a flow of command can pass between associated objects. Boundary limits and related ranks or hierarchies serve a range of purposes in decoding a stream of objects. Such a means for handling objects is necessary to maintain the range of expressive powers in FL. This section makes use of an extant convention to describe this capacity. Nested brackets that express a control relation are found throughout the disciplines of FL and are here generalized from their usual contexts in order to treat them as one phenomena. As before, there is nothing radical in this. The intention is to achieve the simplest possible view of the construct from within a stance offered by transcendental phenomenology.

For an operator’s function or an operand’s reference to be distributed through an object stream implies that the spreading of the distributed effect must stop somewhere. This is quintessentially a matter of control, the spreading of syntactic controls (or other functions) must somehow originate, extend and then terminate its activity. This tripartite structure echoes venerable trinities from the Vedic height of Brahma, Vishnu and Shiva as { create preserve destroy }, or { starting changing stopping }, to the base physical ground of switching, as in { on null off } or { positive zero negative }. Whimsically, one might imagine that an invocation of multiplication or the utterance of a pronoun would otherwise generate an intolerable infinity of applications and bring about a stupifying cacophony of reverberations. Naturally, such anarchy would hinder everyone’s conduct as well as the more general survival of our species. Luckily, this calamity is averted in real life and, in the shadowing world of FL, only a few moves are needed to express this control or constraint. Gottlob Frege provided the expression of binding by operators upon operands in logic and mathematics. His work is seen today expressed in forms such as \[ 3x [ Ax Bx ] \], where the \[ 3x \] is an existential operator which stands for “there is an \[ x \]” that has some attribution represented by variables A and B.\footnote{Its complementary operator is universal instantiation \[ Vx \], thus \[ Vx [ Ax Bx ] \] might be something like “for all \[ x \], \[ x \] has the attributions of A and B.” The ostensibly indefinite determiner ‘A’ is not always existential as in \[ A \text{ person left early.} \] since it could occur in a sentence such as \[ A \text{ integer is a whole number.} \].} The domain is filled and delimited. Such expressions won’t be used here as reduced forms such as \[ \text{ operator [ operand ] } \] should suffice.

Simply put, we can place objects within objects (brackets within brackets) in order to show how one object dominates another, to indicate the presence of categorical similarities (the embedding of one type of object within a containing object having a similar or expanded category nature), or to indicate restrictions of scope.

The term scope always refers to a boundaried domain. It is the extent or extension of a category, which acts to associate or reference other syntagmata. Here, as in the last section, such a boundary will be
indicated by the use of square brackets. Scope can mean how far the operation of negation is to extend (to a noun phrase, a verb phrase, or a whole sentence). Scope can mean simply that a color adjective, or an intensifying adverb applies to the immediately following noun ([a very white page]), and no further, except when that object itself is directly or indirectly re-invoked. Scope is applied very usefully within symbolic logic and formal grammars as well as within the bracketing convention of mathematics mentioned briefly in the introduction in §1.3. Scope has a number of other meanings as well. Prominent among these is in the topic of anaphoric reference where an operand might be co-indexed (as the demonstrative pronoun THESE in this sentence refers back, or is co-indexed with the noun phrase A NUMBER OF OTHER MEANINGS in the immediately preceding sentence). Anaphoric or co-indexed items are within some larger domain and notions of higher or lower are sometimes invoked to indicate how a pro-form can see its referent. These indexical phenomena stray in structuralist theories about how objects are referred to or commanded within other parts of FL literature not dealt with here except under the general notion of object-control or constituent-command. Chomsky has developed increasingly sophisticated form of such ‘c-command’ which may be seen parallel with Frege’s innovation in the binding of variables. (Note the metaphoric character of the italicized words WITHIN, HIGHER, LOWER, SEE, and COMMANDED in the previous sentences. This is generally true of nearly all meta-language and will pass without further comment.) Anaphora and the indexing of operands are not a special concern in this work. Of greater interest are the boundaries of scope for noun, verb and sentence objects, what categories (or object names) properly apply to the associated objects and how theories say these objects associate with one another.

In post-1981 Chomskian grammar, notions of command and other formal constraints were further developed to characterize the categorical extensions found in natural language. This area remains in flux for the FL about natural language. Although there are partial systems of logic (modal logic, tense logic and various ways to express the scope of quantification, negation and other modifiers), these won’t yet adequately capture what we do with natural language. One problem is that ostensibly single syntactic objects such as a sentence or noun phrase will manifest more than one category nature. Consider a compound sentence with a subordinate conjunction or relative pronoun such as [S [which [S]]]. The embedded [S] will show a kind of dual (or perhaps greater) nature as it projects both its inflectional features of tense or aspect and the agreement features of its topic or focus (and sometimes other attributes such as the definiteness of its determiners) to the boundaries of the conjunction’s position.

The simplest nested control structure is [object [object]], where the first object has an operator or pointer-like character and the second, more static, object is related to or acted upon. An example of this

† The word ANAPHOR is applied to the general subject of pronouns and other pro-forms doing their work of referring to objects in nearby phrases and sentences. Etymologically, anaphor comes from Greek roots meaning “carry or bring back or again” (cf., METAPHOR). Another related term is DEIXIS, from the Greek for “pointing”.

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has already been seen in \([ 2 + [ 5 \times 2 ]]\) but a more minimal arithmetical example may be obtained from the prefix notation in line 2.2.4, where \([ + 12 ]\) might equivalently be expressed as \([ + [ 12 ]]\). This expressive distinction is made more obviously necessary when set-like or list manipulations are done in a programming language such as LISP where more than two operands are present, for example, adding \([ + [ 123 ]]\), or alphabetizing a list with \([ \text{sort} [ \gamma \beta \epsilon \alpha \delta ]]\). The function of the prefixed operator, categorically dissimilar to the operands, is distributed through the set of operands. Notice the efficiency of this style of representation: it announces at the outset what it is going to do; the operator needs to be stated only once; operands are listed together neatly; and scope is efficiently controlled. Again, these are obvious fundamentals, and indicate how computation is made easier by its roots and companionship with FL.

The ranking brought about by bracketing objects in \([ + [ 123 ]]\) shows the flow of control (a flavour of directed intention) from the level of the operator \([ + ]\) down to the operands \([ 123 ]\). It is not merely an artifact of structure that the metaphor “higher” means power over something that is “lower” or, that a notion like “containing” means domination of that which is contained.

In natural language, Chomsky knew his early math-like noun phrase representation as \([ \text{NP} ] \rightarrow [ T + N ]\) (line 2.2.2) to be inadequate from the outset, but it was powerful and over the years better formulations were given. Currently, a structure first offered by Paul M. Postal in 1966, \([ \text{DP} ] \rightarrow [ D \text{NP} ]\), is in widening use after being given more rigorous argument by Abney (1987). This is a simple form of what is called the DP hypothesis.† This expression needs to be richer than what is presented here since \([ \text{DP} ]\) can take more syntagmata than are shown here — complements such as adjectival phrases, prepositional phrases, clauses, etc. — but the essential point is that the noun phrase is seen as properly contained within the scope of a determiner and is thus within a \([ \text{DP} ]\). The determiners include articles, certain pronominals and possessive forms of names (e.g., \(\text{your}, \text{John's}\)) and quantifiers (e.g., \(\text{much}, \text{two}\)). This inverts Chomsky’s earlier structure, as well as all earlier structuralist views of natural language, except for that of Frege whose work formalizing quantifiers and variables founded modern symbolic logic. The work of determiners, like so much of natural language, continues to challenge understanding. Annual conferences exist solely to try to better formalize (in)definiteness, or to address the phenomenology of how to relate parts and wholes (mereology), and other roles served by determiners (and quantifiers such as \(\text{some}, \text{all}, \text{one-tenth} \text{or} \text{twelve}, \text{which exist in this same syntactic location}). Because noun phrases , their forms need more a richer realization in order to describe the facts, although rules can be written. Two common forms are shown on the next page.

† Perhaps some quick sympathy can be garnered for the DP hypothesis if one observes how a pronoun (relative or otherwise) is a very fully specified or determined object, not really a pro-noun but pro-determined-noun.
In the figure below, we simplify the DP hypothesis to the form \([ \text{DP} \ [ \text{NP} ]]\) and reflect briefly on three styles of representation: phrase structure trees; bracketed constituents; and Venn diagrams.

There are some differences in the preceding representations, but initially, these are used as if they are equivalent. Again, the caveat is repeated that such a shape does not instantiate any special psychological reality or instrumentality, although these have long been in use for pointing to putative acts of cognition. This style of representation will appear and reappear in a variety of contexts as it is pivotal to showing how the internal constitution of formal representations for natural language objects may be understood, and due to its felt-congruency with the application of transcendental phenomenology to FL structures. Venn diagrams (in some instances) can be mapped directly onto a bracketed representation as seen below.

The figures in 2.7 do not show the position of the bare determiner as does Figure 2.6, but brackets can express the same detail as trees simply by labeling the brackets: \(\text{[DP D [NP N]]}\). The label on the bracket is thus equivalent to the non-terminating apex or node of a tree branch, a phrasal category which then terminates as an object. Venn diagram shape resembles the middle structure in Figure 2.7 (i.e., the
[DP [NP]] rather exactly if you imagine the Venn diagram turned flat, equating the edges of its shape with the matching category boundaries of the brackets.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[DP [NP]]</td>
<td>[[NP]DP]</td>
<td>[[DP]NP]</td>
<td>[NP [DP]]</td>
</tr>
</tbody>
</table>

Table 2.4 Available permutations of {DP NP}

The [DP [NP]] relationship might also be seen more abstractly as the relationship [operator [operand]], or a pointing object and an object that is pointed to. Commonly, some determiners (such as such as THE, AN, THIS, SOME, MANY, NONE, MUCH, and so on) are visualized as acting to pick objects out of a group or set, or to perform fraction-style functions on that set (mereology again). Perhaps some languages reverse this: to [[NP]DP] or [[operand]operator], but this would be a mere consequence of sequencing complementation (the choice of linking-ahead or linking-backwards mentioned in §2.2). The physical order of objects would be reversed, but the ranking or hierarchical relationship would remain constant.

Note the constancy of the representation provided by the two Venn diagrams. Set 1 is the relation currently held to be valid if the DP hypothesis is true. Set 2 is merely a permutation which maintains the same hierarchical relationship, and thus, if such a form exists in any language, it only indicates a distributional fact, and not any difference in the envelopment or command of [NP] by [DP].

A traditional method for expressing this difference between linear order and rank or hierarchy is with notions of dominance and dependency. Parallel terms that are usually applied to tree structures label the superior and inferior nodes of the tree as parent and child, the relationship of the figures in the table on the next page.
Table 2.5 Dominance and dependency; parents and children

Venn diagrams provide unsurpassed simplicity and clarity as a pedagogical aid for assisting some kinds of reasoning in natural language, for expressing the relationships of sets and related theories, in understanding syllogistic reasoning, or in learning introductory logic (the basic Boolean operators \{ and or not \} are essential to effectively querying databases, or for that matter, the development of modern computation). Such constructs aid the recognition of paradox and contradiction in literature and life. Under many conditions, Venn diagrams are superior to the use of brackets, although brackets are more compact as they can provide considerable amounts of information within a single line of text. Thus these conventions can be used interchangeably, with occasional indicated exceptions. For instance, the next figure shows how quantification with a Venn diagram. Simple syntactic bracketing of objects cannot express the set-like intersections of quantifier scope (although the compound logical calculus developed by Frege can).

![Venn Diagram](image)

Figure 2.9. Some people are Greek.

Two overlapping ovals delimit three areas. From left to right, under the customary interpretation, they correspond to three quantifiers: **ALL** (the whole of the left oval), **SOME**, and **NO** (**NONE**) (the unintersected portion of the right oval). The scope of **SOME** is the intersection. Mathematical relationships and Boolean operators can receive similar treatment.

Looking at determiners again very briefly, it can be seen that words like **THIS** or **THAT** clearly serve to point out an object from a group, though in this case, they also differ on a notion of proximity in space or
The definite and indefinite articles serve to select out a single [NP] but how we distinguish their use is not always easy to explain, formally or informally. English-as-a-second-language teachers can have terrible difficulties explaining the intricacies of English article use to a non-Indo-European speaker. Applicable textbooks try to do as well as they can, but it is a task that no one seems to understand very well, thus the annual academic conference topics. Determiners not only pick out objects from within their category, they also extend the ‘sub-atomic’ feature of their syntagmatic definiteness outward beyond the immediate [S] environs. A joke about a [definite] character will not end with the indefinite “A” except under quite well-defined or special circumstances. An abstract notion of relevancy applies — a visible agreement of definiteness is necessary — and unless the definite “THE” is maintained for the target subject, the sense of the joke would be spoiled.

This section has addressed the form and use of the relation \([x[y]]\), applying it to the context of the syntactic structure of nouns. This structure provides one more notch of incremental complexity that allows pointing or dominance of FL objects (as a function of their category) to other nested FL objects. Such a pointing can be expressed as a matter of control or command. Thereby, a higher ranking object exerts its category nature upon the enveloped form. Such extensions of category nature may provide delimitation of relation about a verb’s operation, or a function such as the spreading and marking by inflection or agreement in their various forms.

One extensional assertion of category nature from a higher node is to determine the existential setting of the dominated object. However, to refer to the ‘existential settings’ for the objects of Table 2.1 and 2.2 is to make the slip earlier forsworn of confusing word and object. Such objects can only have transcendental settings, that is formal syntactic operations or principles related to them as syntactic operands or operators. Yet when the control is such as choosing the items out of a set, as is done by a determiner, one readily slips into seeing these operations as if they were about existent things, rather than being a representational ideality for how we express our (always slightly fictional) grasp of the world.

The next section may be regarded as discussion about a single type of control which determines transcendental settings.
2.4 Throw

The last two subsections profiled different kinds of association: one of sequence, the other of rank. The next pages extend these to FL-bound directedness into a transcendental frame. This is a subset of the phenomena which fall within the [operator [ operand ]] relationship. The symbol-bound conjunctions of intentionality with modality will require the groundwork set forth in Chapter Three.

The term THROW has been chosen to title this section in accord with three themes. First, Heideggerian phenomenology introduces the term \textit{thrownness} to address the phenomenal state of our life in the world where we extend ourselves interactively with things and actions that surround us. We are immersed, and we become immersed. We never have to ponder how to bridge the irreconcilable abyss between the always present realities of consciousness and the solid physicality of action, we are \textit{in, at} and \textit{of} whatever surrounds us all the time, what Heidegger calls \textit{"ready-to-hand."} Language, in particular, immerses us with differing states \textit{of} being (states of newness or re-experience, of finding or creating). Winograd and Flores (1986:33) summarize Heidegger's use of the term as "our condition of thrownness — the condition of understanding in which our actions find some resonance or effectiveness in the world." We don’t ponder in 'passing through' the apex of meaning in the semantic triangle. We immediately are \textit{in} or \textit{with} the sense, or failed sense, of what we hear or read. (Meaning is always partial, never all-or-nothing, so perhaps it is best to equivocate that, even \textit{with} pondering something, one is successively \textit{at} whatever idiosyncratic level of partiality is the case.)

Second, many key terms in these pages embed the morpheme -\textit{JECT} (from the Latin \textit{JACERE}, to throw, from an earlier Greek cognate) in such nouns as subject, object, adjective and interjection, and verbs such as eject, inject, project, etc. There are dozens and dozens of these in English (trajectory, ejaculation, etc.) and a number of them figure in repeatedly tacit form in these pages. Word formation reveals historical processes that are by no means completely conscious. These morphemically-related words only indicate a distributional fact which echoes, ecologically and imperfectly, human intentions and activities.

Third, prepositions or grammatical case present a good paradigm for FL thrownness. "The Latin word \textit{CASUS}, (and the Greek word which it translates) means 'falling' or 'deviation'" (Lyons, 1968:289). English has simplified its overt expression of case over time, just as its verb forms have become reduced.\footnote{The simple morphology of English hides from us the richness of inflection (in its broad grammatical sense for all the declensions and shape-modifying conjugations of stem words) present in other languages. Finnish, for example, has thirteen cases. Old English had much more inflection than modern English. For English pronouns, treating the subject form (the nominative) as a base, most pronouns irregularly inflect for objective (conflating the dative, accusative, ablative, locative, etc.) and possessive (genitive) case; thus, \textit{THEY}, \textit{THEM}, \textit{THEIR}, respectively. English also has pronominal possessive forms (\textit{THEIRS}, \textit{MINE}, etc.). Subjunctive verbs survive in English, but they are decrepit and only evidenced in the marking of the third person singular, e.g., \textit{IF ONLY IT WEREN'T SO} or \textit{SUSAN DEMANDED THAT JOHN LEAVE.}} But it has an array of some fifty-seven (or so) prepositions which take up the slack. The
structure for prepositions is \[ P \{ DP \} \]. They dominate their specified substantive. They locate, situate or position it, relate it, temporalize it, instrumentalize it, all those things that case does. They make the \{ DP \} ready-to-hand for the next enveloping or immersing category.

Contemporary theories present more sophisticated elaborations than those found in the three figures below. These reductions allow faster approach to the thesis goals, and are not intended to be dismissive of the more detailed and truth-bearing representations in modern grammars. From the view of Figures 2.10a and 2.10b, prepositional phrases may look very similar to determiner phrases but they are crucially different in that the domain of the preposition is transparent to the attributes of the \{ DP \}. Any \{ DP \} of course has a 'role' assigned to it by case. Prepositional phrases don't take case; prepositions give it (throw it).

![Preposition and DP Diagram](image)

Figure 2.10c asserts the same pattern as the preceding two figures but with the addition that the bounding category of the sentence is some sort of tense phrase. Other language is sometimes used for introducing this, but Chomsky (1993) treats an outer sentence form (that part that is, in turn, inside the focus or topic) as a \{ TP \}.† Tense is the ruling or dominating category of this level of finding the sentence's character.

Considerable parallelism can be observed between sentences (or clauses generally) and determiner phrases. They both might be said fall under the old-fashioned category of substantives, they co-occur (that is, they are often found in the same syntactic positions in sentences) and they evidence other formal congruencies. Early transformational grammars offered the overly powerful tool of transformational rules which permitted moves or nominalizations between the two kinds of substantives: \{ S \} and \{ DP \}. Thus

2.4.1 \[ \empty \text{Color the white page.} \]

appears to have some deep relation with

2.4.2 \[ \empty \text{Color the page [that deleted NP the page] is white.} \]

The bare infinitival verb stem is used for most modes that are outside of the past or present tense. Again, every speaker knows this, at a deep level.

† Other terminology, rooted in the theory of X-bar theory is often used (following proposals by Chomsky in 1970, q.v. any 1980s or later generative syntax text). X-bar theory is an elegant attempt to make a consistent sentence grammar, but it has some difficulties. Categories of type-X project up two levels, to X-bar and X-double-bar (or X' and X" respectively). Thus a sentence is sometimes referred to as a \( T' \). Due to theoretical flux and difficulties it has also been labeled variously as an inflectional phrase \{ IP I' I" \}, a complementizer phrase \{ CP C' C" \} and \{ S S' S" \)
The symbol "Ø" will be used when there is no overt subject. Chomsky uses the "abstract pronominal element PRO" (Chomsky, 1981:6) which "has no properties beyond those of minimal pronominal element: namely, the features person, number and gender, which must of course match those of its co-indexed antecedent" (ibidem:20). This term is not used here for simplicity's sake, and because I wish to have a notion of [PRO] but, in a simpler and more general way than Chomsky might allow. PRO and [Ø] are in keeping with widespread views (in both Husserl and Chomsky and long before either) that every sentence has a subject, stated or not. The words struck-through in line 2.4.2 should properly be represented by another symbol for a trace, a second example of the class of unusual theoretical entities such as PRO that Chomsky calls empty categories. These syntagmata, like the infinitesimals which roused Bishop Berkeley's ire about "the ghosts of departed quantities" have well-motivated empirical arguments for their existence. See Honda and O'Neil's (1993) heuristic methods for enabling secondary students to discover rules for how NOT-contraction is blocked by such traces. A large number of similar experiments could be devised that make use of this deeply Socratic or constructivist style in classroom discourse (although mere technical facts that say something can be done don't mean it necessarily should be).

There is considerable parallel between Husserl and Chomsky on this issue of examining the phenomena of nominalization. Husserl was conscious that a sentence is categorially not of the same operational type as the other phrasal categories in that sentences don't take on the same grammatical markings that word-based categories do (Edie 1987:45). One might observe directly (that is, eidetically), that to turn a [DP] into a sentence also adds information and thus makes process suspect in any direction. A sentence seems to exude more projections than a [DP] does and thus its boundaries continue to be more complex and problematic, though 'mere' determiner phrases have plenty of indeterminacy of their own.

Figure 2.10c neglects other truths about what sentences must look like. The two sentences below are assumed to be each comprise a single deep substrate sentence ("cognitively equal" is a phrase Chomsky once used, but probably eschew today). And yet they are fundamentally in some deep structural relation. What FL should they be given? Even if an attempt to understand the thought or neurology is uninteresting, consider that we want cross-linguistic machine translation to be achieved and no small amount commerce follows upon its solution. Contemporary Chomsky grammars implement "raising" processes that may adequately explain what is happening with [who]. The verb [do] can be treated similarly but poses another kind of problem that relates to issues associated with infinitival to (an issue deferred to Chapter Three).

2.4.3 You want to see who?
2.4.4 Who do you want to see?
No syntactic structure is yet agreed upon for the structure of interrogatives. The verb DO is felt to either arise (out of substrate necessities) or hold its position as an "empty" tense carrier or marker. There is a rich literature about the various forms and functions of DO which can not be covered here. In English, subjects (as focus or topic) usually come first, thus, at least for this interrogative form, we have the surface apparency of [subject [ tense [ (the rest of) S ]]].

Tense is universally, that is, cross-linguistically, a formal component of verbs (conveniently, the German word for verb is ZEITWORT, time-word). This can be accepted as a reasonable state of affairs if we make a reckless mapping of grammatical tense onto 'physical' time, something that language conduces us to do frequently and heedlessly (noting German again, there the word for tense is ZEITFORM). Of course, tense and time are different, but exploring those differences would skew this discussion. Further, this thesis is not about being-in-time, only its much paler shadow of sentence-in-tense. Whatever time is, we readily see ourselves grounded in or saturated by it. So too the sentence, with respect to tense.

The end of §2.3 mentioned definiteness, a property of determiner phrases. Another visible projection is what is called [Agreement], expressing the controls of [Number], [Person] and [Gender] which modify nouns, determiners, adjectives, and verbs (variously, depending on the language). All in all, there's much to account for, and these are matters of serious attention for syntacticians. That single unit [S] may be seen as radiating some permutation of [Def [Agr [Tns [S]]]]. This ordering of elements† is by no means correct, but the spirited intuitions and theories seem to indicate that sentence, as an idealized form, is the bearer of a subject and a verb, both of which project their inflectional attributes to outer boundaries so that they are salient to matching up with other such syntagmata from nearby sentences. These syntagmata have an existence of the non-physical yet public character previously mentioned. Violating their controls means breaking sense or the relevancy of one [S] to another. These are directly experienced in rules of written composition where their word-shaping demands must be respected. In these regards then, the experience is familiar and unremarkable. There is value in the mysteries for how this might work and what it reveals about language since language so saturates and determines our states of being.

These larger issues provide context for the next chapter's addresses to the throwing or translation-undergone to achieve some of the inactualities that are expressed by the intensional indwelling of modality. The throw can be seen from either side: as a throwing to, or a being thrown. The previous mention of the states invoked by prepositions (or grammatical case) are rather like such resultative

† Tns stands for tense, {Present Past}; Def for definiteness, {+ -}. Agr has become theoretically prominent in recent years and is composite over subject, verb, and object. It manifests as Gender, Number (singular, dual, and plural) and Person (usually just three, but some languages also distinguish whether a pronoun is inanimate, as in the English impersonal it. Grammatical case is internal to sentences, and not really a direct concern here.
noema, and they (similar to the word-based composites of syntagmata such as the -iect- morpheme) resemble the approach that will be taken to English modal events that can be syntactically related or founded in the operator functions associated with infinitival to.

Prior to any throwness, it is perhaps too obvious to say that there must be an initial condition, but such expression is indispensable to physical descriptions otherwise results are incoherent. We in turn know so well our immediate world that we rarely need (nor sometimes are we very able) to think about obvious things such as the basic frames in which we live. McLuhan's remark about how "fish do not know that they are wet" seems apropos. Heidegger, doing phenomenology with an existential focus, has brilliant, practical and subtle insights that may be amenable for grounding the compelling computational approaches that Chomsky has spearheaded and in some artificial intelligence circles, a turning toward Heidegger seems to be taking hold. Heidegger offers disciplined thought about thinking and language from a pragmatic embodied perspective which has stimulated philosophers of mind and computational approaches to consider Heidegger's notion of Dasein (that our ontological ground is being-in-the-world; we live within the canvas of time and action) as shedding light on the possibility (or not) of synthetic intelligence. Heidegger sometimes solves old dilemmas by reworking them in what seems to me to sometimes be nondual heuristics: subject and object are inextricably melded and it's nonsense to pry them apart; language doesn't represent the world, it points it out directly (Wrathall and Kelly, 1996:5-6); intentions are only understandable as a relation between agents and goals-in-action. Linguistic theories, like the subject of artificial intelligence, have perhaps tried to study target materials too divorced from the hard-to-formalize reality of what it is like to be human.

Modality (from Latin modus, measure or manner) concerns the way or fashion in which something exists, and connotes two ideas: a change of state from a prior condition and the naming of such a state. We are always in some state of modality or throwness, just as we are always grounded in the sway of instincts and emotions. Sentential modality is defined as the ground or frame of a proposition, the surrounding envelope or attitudinal stance asserted by the writer or speaker. Characterizing propositions with respect to their aspect in space or time or cognition has lead to a variety of overlapping studies in the philosophy of natural language FL:† “pragmatics” in the sense used by Hintikka, ‘attitudinal or propositional stance’ as used by Dennett and John Searle, substantial descriptive work about what constitutes a ‘speech act’, tense and modal logics, as well as other disciplines. Modality, as Palmer defines it (1986:2), “does not relate semantically to the verb alone or primarily, but to the whole sentence.” Modality can be explicitly marked and gives rise to a large number of terms. Some of these systematic notions are listed in Table 3.4. Modality is also elicited in English by the set of modal

† The areas of study that follow are areas to study that this research would properly be informed by because they relate so centrally to modality. This weakness cannot be remedied within the scope of this thesis, which must, temporarily, rest with Palmer and some tools for observation.
auxiliary verbs, viz. \{ WILL WOULD SHALL SHOULD CAN COULD MAY MIGHT MUST \} as well as by a number of sentential adverbs which express temporal and duty-related controls concerning contingency, necessity, possibility and other related notions. In modal logic, the expression of necessity is represented with a square; for possibility, a diamond (quickly skirting issues of content instantiation or intensionality, again). In either case, the marker prefixes and thus brackets the whole of the proposition. Events may be hypothesized as happening in the past or the present, thus tense is subordinate to modality, even though this salience is opposite to how the surface form of English sentences often appear. The egocentric inflectional features of subject or topic are further exterior to such a representation of course as they relate to the basic ground or identity that is in the ideality of a statement. Modality in this sense is another kind of projected object of consciousness or noema.

Figure 2.11  [ modality [ tense [ sentence ]]]

Figure 2.11 should not be a controversial graphical conception, except for its incompleteness. In Chapter Three, a more syntagmatic conception will be adopted that intersects Husserl with Chomsky and some contemporary cognitive approaches to language.

Traditional English grammars say that a statement using a single unadorned verb about an event in the past or the present is in the indicative or declarative mode. The discussion of modality in §3.4, treats the indicative mode as an initial condition, which then — by dint of a trigger of verbal intentionality, often overtly expressed, sometimes hidden due to historical processes — bridges or transits to a different noetic apprehension of noema with respect to expressions about temporality or space or cognition. Indicative certainty breaks into modal necessity (must come to be), potentiality (could come to be), or possibility (might come to be).

It might be permissible to see certain kinds of mathematical processes also as modal changes. In describing the positions of objects in space, we use vectors to provide an expression of magnitude (in this case, a quantitative measure of space) and direction. In order to throw from distance to velocity to acceleration — from $\vec{a}$ to $\vec{v}$ to $\vec{a}$ — successive derivatives or operations with infinitesimals are used. A distribution of the mathematically represented space across an infinitely small but non-zero and non-real numerical quantity of time is applied in each case (from distance alone without any time, to

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\[\text{2 Intensions 47}\]
distance across or over time, to distance across the square of time). There is a slight parallel here with how infinitivals might be seen to operate in English modality and with some methods for resolving Zeno’s paradoxes (McLaughlin, 1994). Such description adumbrates that zero always seems to be wedded (or at least in active common law intercourse) with infinity in a variety of recurring horizons. Both zero and infinity have the unreality of absolutist objects, as the real action occurs in between, but still we use them as targets. The character of the semantic oppositions in antonyms seems illustrative. Semantic opposites are in a sense the most utterly similar of relations, short of the extremely rare event of finding a strict identity between things. For instance, the notion associated with black is identical with that of white for a generable infinity of shared attributes. They only differ in one respect, perhaps something like ‘the presence or absence of natural light hitting the retina’. This might satisfy criteria for a plain reductive view that is nondual without being transcendent and arbitrary.

Modality is a break or a rupture with initial conditions as it introduces new information. Indeed, in a some manner, any object claimed to be within Figure 2.1, or any naming (any word in a page of text) precipitates a little bit of thrownness into a (sometimes very tiny) world founded in the ideality of natural language FL, inducing immersion and difference with adjacent things. This is far too wide a sense to be useful here, but does reflect how notions from each of this chapters four sections — object, order, control, throw — can be hermeneutically applied across the set of FL objects.

The structure used for control, \([ x [ y ]]\), is a useful borrowing from established FL to invoke the character of thrownness brought about by some operators on operands. This structure provides a basis for the discussion of modality in the next chapter.
3 Intentionality and modality

The following sections provide definitions for intentionality and reflexion† rooted in transcendental phenomenology. These definitions give a basis for a more constrained definition applied to some types of propositional modality. These definitions are provided in an attempt to do two things:

[1] to apply a construct derived from early phenomenological literature to a model of verbal inflection which is then used to talk about selected exemplars in English modality;
[2] to present a model that is sufficiently straightforward such that arguments can be made for or against this hypothesis, that is, to easily permit validation or disconfirmation of the claim to some portions of a syntagmatic interpretation of modality.

These sections (§3.1 through §3.4) serve as a foundation for understanding the general design that underlies the issuance of the probe questions found in Appendix A.3.

3.1 Intentionality and reflexion

Intentionality does occupy a central position within human cognition, and that is shadowed within our speech. Husserl writes that intentionality “expresses the fundamental property of consciousness; all phenomenological problems … find their ordered place within it” (Ideas, §146:373). Not surprisingly, differing definitions have arisen over how to use the word.

A common use makes no distinction between the formal notion of intentionality in philosophy and the more obvious and intuitive sense of having an intention or behaving intentionally. Paul Churchland cautions that the philosophical “use of the term ‘intentionality’ has nothing to do with the term ‘intentional’ as meaning ‘done deliberately’” (1984:63). Less strictly, purposive notions might be seen as only a minor part of the meaning of the word. A creeping entry into the vernacular can be observed in contemporary science and humanities writings (e.g., ‘the intentionality of an author’, or ‘the intentionality of computer viruses’). Though unfortunate, this fashionable rise‡ in use can’t be faulted. English licenses the suffix -ITY to generate a more abstract state or condition for nouns. No one is able to control language use, nor can anything stop semantic widening, but there is some confusion introduced since the word already had a carefully developed meaning.

† REFLEXION is the British spelling used in Gibson’s English translation of Husserl. This spelling is continued here to allow a slight distinction from the familiar sense associated with reflection, and perhaps because of the rich literature following Donald Schon’s writings on educational practice. But, reflexion is, loosely, reflection.

‡ In the early part of this project, thanks to an account provided by the UBC Computer Science Department, I was able to search the Usenet newsfeed at leisure. The term INTENTIONALITY was appropriate to the original task of studying electronic research because, as a search term, it tended to yield tight results nearly always germane to this topic. In recent years, the “hits” began to stray more widely afield. They increasingly appeared in discussions of literature, religion, education, and many other venues. Initially, I kept track when these outlier events were few, but no longer.
In the Internet-based portion of the data collection, many respondents to queries about intentionality interpreted that what I really meant (or should be saying) was the notion of intensionality.† This represents a contemporary trend in academic approaches in trying to solve problems in the philosophy of mind and language, and especially, in trying to better understand our meaning-making and meaning-using acts. However, that trend (though it has aided greatly in contextualizing this research problem) leads away from how I wish to look at the break or rupture that is inherent in modal operations.

Husserl is variable in his emphases with intentionality. Sometimes the content is in the forefront, as “We understood under Intentionality ‘the unique peculiarity of experiences to be the consciousness of something.’” (in Ideas, §84, of italicized in Gibson). Elsewhere, Husserl stresses “the act” of “directing of the mental glance towards” (Ideas, passim., translated by Gibson with much quoting of the prepositions in, at and to). Authoritative sources can support either tendency, whether in a ‘common sense’ etymological foundation (q.v. TEND, TENDENCY from the Latin INTENDERE ‘to point to’) or what is assumed by this work to be the more contemporary and semantic turn to intensionality.

Jaako Hintikka, responding to J. N. Mohanty’s analysis (in Dreyfus, 1982:233-254) refers to this distinction of act and content as two “slogans” used by Mohanty for Husserl: intensionality as intensionality and intensionality as directedness, respectively (ibidem:252). This pair may be characterized as having differing loci in noema for the first and (perhaps something like a) relationality for the second, although there is, of course, no clean separation between these. The two definitions have different emphases but readily leak into one another. Although the parallel is not exact, for the purposes of the syntactic orientation that follows, one might see intensionality as noematic (with emphasis upon the object-contents of consciousness) and intentionality as noetic (concerning the acting of consciousness). My noetic act of forcibly further prying apart Hintikka’s suggestion will not do for full-blown phenomenology (which again, this work is not). Noema must also properly include other contents such as sensations and other ineffabilities of feeling and perception, and these (I assume) have no discoverable act of initiating consciousness associated with them.

I believe this forking of intentionality is defensible under the same analytical differentiation that Hintikka originates it, but perhaps more safely (or perhaps more demonstrably wrong, for the person who wishes to deny the validity of my abduction of Hintikka). In this work, this dichotomy is

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† Intensionality is about meaning, the abstract features or attributes which are necessary to define a thing. The term is frequently contrasted with extensionality, the ‘outer’ or ‘extended’ class of things to which a term belongs. Intensionality entails both the connotative and denotative meaning of a term, so long as extensional meanings are excluded. Basically then the definition is ‘the meaning as a set of attributes’ but, a breakdown occurs when dictionaries will also denote that the word means (as in Random House Unabridged, definition 4. of INTENSION) ‘exertion of the mind; determination’. Frequently, intensionality is used in a manner that denotes interiority or a confinement to subjective meaning. Dennett (1987:122): “Different intensions can determine the same extension: the intension of ‘three squared’ is not the intension of the ‘the number of planets’ but both determine the same extension. Different extensions cannot be determined by one intension, however.”
applied to a constricted domain of natural language, where the intensional (named, nominal, lexical) is in lock step under the functional (relational, prepositional, verbal).

Consequently, for the purposes of these pages, there are two aspects to the definition. The first is concerned with general meaning or intensions — objects within mental reflexion. The second is about an act tightly associated with an act of consciousness, which sometimes is purposeful or intentional, but has a more consistent nature as relatedness or directedness. Within the domain of this study (i.e., that language) it will be treated as an embedded grammatical object (at least those aspects examined in this study). This second notion of function is assumed to be a definitive sine qua non, since without the act’s invocation, the language intension would not ‘exist’ (or ‘inexist’ as in a complement in irrileais). These two phrases will be used to frame discussion about intentionality leading to modality. The definitions used in the next two sub-sections will then be abandoned later on in this chapter in order to concentrate on a denotation that narrows the sense of intentionality-as-directedness into a less worldly, and more narrowly syntagmatic treatment, but which (impossibly?) is intended to bring a portion of phenomenological life-worldliness to the vitality of generated modality.
3.1.1 Intentionality as intensionality

Our expressions of feeling or belief reveal intensional meanings that are both intimate and familiar. Such statements are called propositional attitudes or dispositions and express fear, belief, apathy, desire, anger, enthusiasm, etc. They express a wide range of condensed cognition and emotion and receive serious philosophical attention because of their close relation with fundamental aspects of human needs and desires. Such propositional attitudes — relations of dispositions with their associated content — are (usually) about some underlying and discoverable idea. They are said to express intentionality. To quote Churchland’s examples (1984:63):

- the thought that [children are marvelous];
- the belief that [humans have great potential];
- the fear that [civilization will suffer another Dark Age].

Brackets surrounding the embedded sentences are present in the original. They indicate what Quine referred to as the content-clause syntax or that-p clause where P stands for a proposition. In the style of these pages, this would be equivalent to [that [S]]. The conjunction that is called a complementizer in current Chomskyan grammar and forms the outer boundary of sentences, thus [CP Comp [S]].

The ‘that-p’ clause relates closely to modal statements as shown in the examples below. Smith (1991:336) asserts that “a modal operator takes a proposition as its argument.” The point of these examples is to foreshadow a ‘linking-break’ from the content clause or intension and the act of getting-to-content that occurs by means of some relation between preceding or enveloping syntagmata and that clause, syntagmata that are motivated to ‘reside’ around the [Comp] area or the that and which are posited as mediating the link to the intension of ‘John’s leaving’ in whatever mode it appears.

- 3.1.1.1 It was necessary that John leave. (LEAVE in subjunctive mood, a bare verb stem or infinitive)
- 3.1.1.2 John was required to leave. (periphrastic form of modality expressing obligation)
- 3.1.1.3 John had to leave. (periphrastic modal form)
- 3.1.1.4 John must leave. (simple modal auxiliary verb)
- 3.1.1.5 (Someone) saw John leave. (verbs of perception take the bare infinitive form)
- 3.1.1.6 (Someone) made John leave. (causative constructions take the bare infinitive form)

Such sentences can mean differing things, but it is desirable to observe that the lines above, with the exception of lines 3.1.1.5 and 3.1.1.6, the leaving hasn’t happened. The notion of irrealis as an overarching category of modality will be used to generalize about these states of inactuality. Modal auxiliary verbs offer a particular economy of expression which in turn means that they are often ambiguous, illustrated by the difference of agency in lines 1.3.3 and 1.3.4 and in appendix A.2. Not all intensionalities are very intentional (think of Tourette’s Syndrome, or a song that runs through your head ... ), but intentionality necessarily entails intensionality, regardless of its coherency to others.
3.1.2 Intentionality as directedness

A notion of having individual will or volition is pivotal to our sense of freedom and identity. The success of daily actions depends upon assumptions that we have this power, at least in a local sense, although its objective existence is sometimes often argued to be a widespread delusion (in the sense of folk psychology or a naturalistic fallacy). A definition for intentionality-as-directedness may appear to be closely associated with some sense of volition, but such concerns are not germane to the following discussion and ramify far beyond the scope of this work since it will be confined to the constrained world of propositional structures where intentions, regardless of their objective reality, are part of the game.

Brentano is widely credited for a revival of an earlier Scholastic treatment of the intentional. He asserted that intentionality is what distinguishes mental phenomena from physical phenomena.1 This point of view received wide acceptance at the time though it has since has become more controversial. Follesdal (in Dreyfus, 1982:31) says that Brentano “held that intentionality is characterized by a certain kind of directedness”.

Again, a definition for the verb INTEND is not adequate to this sense of what intentionality is. A sense for intentionality is sometimes evoked with as simple a referent as the directionality of a pointing arrow. The following two figures are found in the Encyclopædia Britannica’s definition in a survey of the philosophy of mind (25:118).

![Figure 3.1. Figures that demonstrate intentionality](image)

![Figure 3.2. Figures that do not show intentionality](image)

Graphics are obviously physical, just carbon on paper, not mental events at all, but clearly in Figure 3.1 a perceptual or subjective notion is invoked. Heidegger would want us to see ourselves as a part of the act, away from the false reductionism engendered by representations and (perhaps with the arrow in Figure 3.1 dropping away) apprehending the circle directly (Wrathall and Kelly, 1996, §15). For Husserl, the interesting activity is in the apprehension of such percepts. (Early Husserl uses the term

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1 The Quinean notion of the ‘that p’ content clause as the hallmark of the mind may be even better, but entails a different epistemological view of these matters. It places a more intensional take on Brentano’s intentionality. In mild contradistinction to both views, the emphasis here will strive for a more finely grained view by looking at the syntactic function of a subordinate conjunction such as THAT as well as other syntactic objects that, according to contemporary grammars reside in the [ COMP ] node just outside [ S ].
NOEMA, roughly, for what is here called intension, but later, the term is used more for how the noemata come to be through the senses and in other analyses of their properties.) This graphic should also be criticized for embedding two transformations in moving from Figure 3.1 to Figure 3.2 (to wit, the separation of the triangle from the line, and, its 90° rotation). But the ‘point’ of the author’s illustration is made. The effort in this section is to direct attention only to the metaphor of arrow.

Husserl was moved by an awareness of how both thought and action embody intentionality with respect to the meaning or function of objects, acts and changing relations in the world. This comprehension immediately invokes a consciousness about consciousness, probably the signal metacognitive act of mind, the fundamental, common and potentially continuous, but non-trivial, experience of being alive that sometimes calls for wonder. Husserl imbues his phenomenology with an exploration of this awareness: the interpenetration of self with actions and objects in the world. Heidegger extended these notions again, refining and expanding the focus onto the character of authentic consciousness seamlessly operating as presence within the continuum of time and actions in the world (Dasein, our live situatedness as being-in-the-world).

Husserl counterposes INTENTIONALITY with REFLEXION, this latter word referring to the object of consciousness and what consciousness works upon (fuller address is provided in the next section, §3.1.3). He views intentionality and reflexion as the two “general structures of pure consciousness” (Ideas, §76:194). This simple pairing has some flaws: the fact that these notions may intertwine and therefore may not be fully separable and proper complements to one another; that confusions easily develop between the general processes of intending or reflecting, and intending or reflecting particular things (or in language analysis, the slippage between referends and referents); that any such simple dyad may be some sort of categorical error from the start (of the kind Ryle might criticize as category errors); or that some subtle reification is in play and distorting a proper view; etc. It is upheld because it is simple and it feels like what we do.

Another sense for intentionality that conflates both the content of intensionality and mental directedness (in this case to an action) is the way the term is used in law. Here we find evaluations of states of mind about matters that are often pivotal to findings of guilt or innocence, and certainly have impact on the severity of the received sentence if found guilty. The jury or the judge will take into account the ‘intentionality of the accused’ at the time of the act. Severe consequences attend to the judgment of an accused’s mental state by a jury. Judgments about negligence provide perhaps the most salient examples. As an example, in the case of person killed in traffic, a court will act much differently against an accused found to be willful, or more likely, heedless, reckless or negligent, as opposed to a driver exercising reasonable care and attention. The notion has to be applied across a wide array of alleged crimes. Here, the accountability is not just about having a thought; it is about doing
with a thought. Again, this sense of intentionality is unfriendly to the purpose of this research as it folds in mental constructs that include thick colouration by goals, knowledge about actions and results, and in short, much that has to do with the contents necessarily ushered in by the larger more general directedness (INTENTIONAL) sense of intentionality.

More usefully, the term ABOUTNESS has come into use as a basal idea about intentionality (Dennett, 1991:333). This term places more emphasis upon the act of referencing (and less therefore on ‘pure’ intension) or upon the pointing to a formal relation between a state of consciousness and a reflexion associated with that state. Each propositional attitude above is linked to a bracketed phrase which is its ‘aboutness’ or referentiality. Aspects of directedness (an effort towards ‘content’) start to intrude upon the definition. Combining both notions of intensionality and directedness, Dennett defines intentionality, using ABOUTNESS synonymously with the phrase INTENTIONAL STANCE. Dennett says:

The standard philosophical term for aboutness is intentionality, and according to Elizabeth Anscombe [Anscombe, G. E. M. 1965. “The intentionality of sensation: a grammatical feature” in R. J. Butler, ed., Analytical Philosophy (2nd Series). Oxford: Blackwell, p. 160.] it “comes by metaphor” from the Latin, intendere arcum in, which means to aim a bow and arrow at (something). This image of aiming or directedness is central in most philosophical discussions of intentionality, but in general philosophers have traded in the complex process of aiming a real arrow for a mere “logical” arrow, a foundational or primitive relation, made all the more mysterious by its supposed simplicity. How could something in your head point this abstract arrow at a thing in the world?


Skipping lightly past the nature of “a thing in the world,” the “something in your head” that does this pointing points at some other thing in your head first. Ultimately, it may point to something beyond the body (normally that is, ... we can of course think about things which don’t exist, or we can hold false beliefs). We should also bear in mind that POINT is a spatial or mechanical metaphor, a physical analogue for an activity which likely is utterly devoid of any such space or mechanics. The difficulties here are not solved by semiotic triangles. They are partly addressed in the epistemological approaches such as the ‘correspondence theory of meaning’, internalism, representationalism, various kinds of dualism and theories about subjectivity, etc. Heidegger’s position provides a solution, an anti-representationalist stance summarized by Wrathall and Kelly (1996, §14-17). Heidegger’s position is that we don’t think about things or represent our goals in reflexion before we do something. Of course, we can, and philosophers do. We can additively consider our goals for reform or analysis, but most of the time we don’t. We automatically respond to feedback and using a host of inbuilt coping skills to do, or speak, or think, even if these are unimplemented or unspoken (Dreyfus, 1993, passim, or, for microbial life, see Varela, 1991).

The Dreyfus analysis indicates Heidegger’s capacity for inverting much of what may seem to be common sense. Quoting Føllesdal (ibidem:18) he says Heidegger “regards our practical ways of dealing with the world as more basic than the theoretical” reversing or undermining “the Cartesian tradition of the priority of knowledge over practice”. He takes the transcendental knowledge of Husserl and
embodies it into *doing*. Denial of a necessary cognitive presence or validity in mental representation\(^\dagger\) harkens back to the earlier remarks about there being no claim of psychological reality for phrase structure trees per se, or any other syntactic assertions on these pages. This is also *not* to say that we do not make meaning or representations and that they do not have the capacity for doing useful work and fitting with reality, only that the representations don’t mediate. Perhaps in a small way, this can be seen like the old problem of the homunculus or the infinite regress in locating viewers of Cartesian theatres. We make analytical moves and generate (helpful) representations for various purposes, but then wouldn’t there have to be representations to mediate with those new objects, and so on, endlessly recursing. Quite rightly, the possible paradoxes or methodological contradictions of asserting these stances while claiming to do transcendental phenomenology on syntax should be pointed out.

As a consequence (while not denying its analytical usefulness) the semiotic triangle flattens to a (non-dashed) line, a binding through this agency of intentionality that is directed but not necessarily deliberate (suggested by Okrent, 1993:19).

Thus, if this is true to Heidegger, words are tools to usher forth and make their correlatives ready-to-hand, or, under Heidegger’s notion of Dasein, to produce immersion. This welded connection readily floods mental life with noema of varying reliability, but as a mechanism, it is wildly efficient. The undashed line doesn’t mean an equational relationship between words and objects, just an (often) unmediated one. If the distributed regularities of noema are clinicized as some mere feedback loop for capturing the world, still the marvel about the instincts that drive us imperatively to connect. The connection between FL object and its proper substrate is nowhere but in the mind, ineffable except through the noise of words blocking the phenomenological roadway.

Wittgenstein referred to this process as “the bewitchment of language” and whether such daily magic is given the label intentionality or intensionality, or some other better idea is provided, may make no necessary impact on the next sections. Intentionality-as-directedness is perhaps the more familiar and traditional notion of intentionality, including, as it does, the feelings of purpose or intention in its more overt instances. But when apprehension of its context dwindles to simple direction and then relation, the slogan may not be distinguishable from intentionality-as-intensionality.

\(\dagger\) This is not to deny that we can’t have or generate representations, only that we don’t necessarily. Consider for instance, that although there is lots of magic possible by way of intensionalities, it may well be that they are all fundamentally grounded in instincts, drives and emotions. Where would the representations start or end?

![Figure 3.3 Naming makes direct contact](image-url)
In the context of language, the conception of intentionality-as-intensionality may be seen as more static and or substantivized when compared to the more active character of intentionality-as-directedness. The direction of argument is to see the propositional "P" of that-p clausea (lines 3.1.1 through 3.1.6) as being an intensional object whose nature is extended outward as subject (or focus or topic) grounded by tense or inflection. The syntagma or referent of infinitival TO may be seen as patterning with tense in pointing to the mode of an embedded sentence. With infinitival verbs, this may be the default mood — a non-thing or uncoloured relation that yet seems to provide the duct for releasing us from the more finite grounds of present and past, syntactically† at least. There are extant representations for it from Chomsky but its connection with intentionality is weak, though I take the view that Chomsky has inexorably been strengthening the connection with the rising power of generative grammar in expressing richer inflectional notions for case, [agreement] and [tense]. Husserlian and Heideggerian approaches, in other ways at variance with each other, can provide a supplement to this process. A representation for zero tense or zero inflection will be used, with a claim that it warrants consideration either as 'something in the head' or something that is in our shared public head, sine qua non modality. Intentionality is the Bakhtinian baggy monster, an Überconstruct which I wish could be avoided whole, but, given that these reifications are somewhat in order, a little piece of it is pivotal to the kernel of modality.

Husserl addresses the “other thing in your head” in the next section with his conception of reflexion.

†If Reddy's Conduit Metaphor is to be entertained then how should such a pipe be reified? Why by uncountable recursing tiny glued-together ducts or rings (doughnut or torus shapes?) of course — such ducting leading to what is ducted — and thus its 'syntactic substrata' (in Husserl's phrase) would be as the hierarchy of objects in Table 2.1. But if words are intrinsically deceitful about ontology, then metaphors should be doubly damned. Grammatical tense is, at least, a good candidate as it converges from multiple perspectives from logic, grammar, and phenomenology. In regards to 'release from the past or present,' a merely syntactic release has subjective variables but is no unreal thing. Such release may lack objectivity but no person would deny that text from books, or words from another, can bind, trigger or transport the inner self to conjectures and desires about possible worlds, fantasy or future.
3.1.3 Reflexion

Paraphrasing Husserl, reflexion is any mental activity entailing COGITATIO (a conscious experience), thus containing anything from within the stream of consciousness, or any immanent conscious perception existing within the COGITO (the continuum of experiences). Husserl discusses sitting at his desk, a white piece of paper before him, the COGITATUM, and then provides a dense description, an ethnography if you will, of his cogitatio with that white piece of paper:

Let us start with an example. In front of me, in the dim light, lies this white paper. I see it, touch it. This perceptual seeing and touching of the paper as the full concrete experience of the paper, that lies here as given in truth precisely with this relative lack of clearness, with this imperfect definition, appearing to me from this particular angle — is a cogitatio, a conscious experience. The paper itself with its objective qualities, its extension in space, its objective position in regard to that spatial thing I call my body, is not cogitatio, but cogitatum, not perceptual experience, but something perceived. Now that which is perceived can itself very well be a conscious experience; but is evident that an object such as a material thing, this paper, for instance, as given in perceptual experience, is in principle other than an experience, a being of a completely different kind.

(Husserl, Ideas, Chapter 5, §35:105)

It is not clear to me how, for Husserl, unconscious mentation (to wit: sublimated pain; ‘unconscious’ feelings or attitudes; uninspected or forgotten knowledge) plays a role within the stream of events that constitutes reflexion. Or what of transcendental experiences such as Zen, where perhaps nearly all content can drop away leaving the cogitatio resting square upon the conduits of perception or awareness? Husserl’s notion of reflexion runs parallel to Freud’s concept of NACHTRÄGLICHKEIT, the dynamic activity of re-transcription of recollections, the entering into and the coming out of memory, thus reconstruction of experience, often out of conscious view. This holds relevancy to the act of learning, or (for Freud) to how it is that the talking therapeutic process might work (we only reconstruct, we never ‘remember’).

Difficult issues arise here, striking at other disciplines. With the exception of one, they don’t have to be addressed. That difficulty is how could reflexion be directed to an object from Table 2.1. Some of these tokens are cultural artifacts, and some are controlling categories that apparently exist in discrete brain areas (Poser’s 1995 study shows that nouns and verbs may be processed in different neurological locations). But these are then, perhaps by definition, unavailable to reflexion. Empirical linguistic study has carefully crafted intuited and found phonological, word and sub-word level categories to provide reliable descriptions. Eidetic reduction proceeds, hoping that these categories are valid, and we can experience the immersion into language-bound irrealis as a qualitatively distinct experience. Practiced reflexion hones the perception of when that immersion happens.
3.1.4 A figural convention for intentionality-and-reflexion

Throughout Husserl, and later phenomenology, are assertions about the primacy of intentionality. Intensionality or intentionality-as-intensionality, on one reading, may be seen as always residing within any experience that entails consciousness. In the broadest definition, intensionality and consciousness seem almost materially equivalent. (As previously stated, when INTENTIONALITY is used, intentionality-as-directedness is intended.) Reflexion, on a reading as deliberative intension, makes a weaker showing as it "is not discoverable in every experience, whereas intentionality may always be concealed in it" (Ideas, §84:223). Regardless of the reading, when reflexion is present, intentionality has primacy over it.

Using the bracketing convention, an analogue (a metaphor) for Husserl's assertion of the relationship between intentionality and reflexion would look like:

3.1.4.1 \[ \text{intentionality} [\text{reflexion}] \].

This then is a claim that the relationship can be seen as if it were a syntactic relationship. As in previous discussions (q.v., §2.3 on control) the order is not spatial or temporal, but instead is a relationship of rank or relative saliency within cognition. As in the dominance of \([\text{Tns}]\) over \([\text{S}]\), it is the dominance relationship that is of interest. Other possible permutations don't meet criteria of primacy for intentionality, but during data collection one respondent did argue that the reading should be:

3.1.4.2 \[ \text{reflexion} [\text{intentionality}] \].

Previous disclaimers about the inexactitude of the contained constructs applies. The bracketing in line 3.1.4.2 above is assumed to have some fit with the cognitive scene Husserl describes, but this bracketing is only minimal and rough description of a partially perceived form. This assertion of poor perception is not intended to be disingenuous. I wish to hold to this form, but not make any special claim for it beyond the cautious assertions that it feels right, obtained some sanction during data collection, and fits nicely with the FL preceding and following.

As before, the relationship is reiterated with a Venn diagram Figure 3.4a below, assuming that the issue of inclusiveness is not problematic. Figure 3.4b is added to address what I believe the respondent above either thought I meant, or feels himself is the valid relationship. In either case the containment of the surrounding object is total, with another framing category of situatedness within the body.

![Figure 3.4a](intentionality [reflection]) ![Figure 3.4b](reflexion [intension])
Other set permutations are conceivable, but don't appear to be useful in this context. I believe that Figure 3.4a is adequately true and is useful to the following sections. I believe that Figure 3.4b is also reasonably true, but is of lesser use here. We can neglect tree structures but it may be of interest to put this figural relationship into logical terms. This relationship might be stated as a proper entailment: that is to say, if reflexion is present then that implies intentionality, or, intentionality is a necessary and but not sufficient condition for reflexion. And thus, reflexion is a sufficient but not necessary condition for intentionality. Husserl's statement indicates that though intentionality may be present in consciousness, reflexion need not be. Perhaps intentionality without reflexion is possible, but the assumption here is that is not the case.

This claim of order and relation in intentionality and reflexion has weaknesses. The role of the unconscious, whatever it may be, is ignored. The likelihood of a cognitive fundament being this representationally simple and binary, and susceptible to capture with an easy spatial representation in a two dimensional graphic seems unlikely, just as there is no claim of explicit psychological reality for tree structures or syntactic bracketing or rules. A graphical representation like Figure 3.4a may capture some sort of relation, but it exists nowhere in the brain (or mind) given contemporary ideas about memory and brain functions being as highly non-localized or distributed as current thinking would indicate. But a graphic can make the easy duplicities or snarls of verbal description evident, as well as lessening part of the semantic load.

The purported value of this construct is that it is simple, it does appear to comply with Husserl's assertion, and most usefully, it can be exported top-down to the language structures which follow in the next sections. This is no controversy of Husserl, but intuition would seem to compel the observation that intentionality should always be directed at something, and thus one would always expect to find a cogitatum or event that is 'pointed' to, perhaps motor movements, habits, etc. Though we do have “this wakeful intercourse with the correlate object” (Ideas, §84) perhaps the less it is specified at this juncture, the better.

Previous ideas can thus be reformed to echo parallels between the [ operator [ operand ]] relationship and [ intentionality [ reflexion ]] to yield [ −→ [.]]. It is something like that, a directedness of pure operator, that is desired for the inflectional approach to modality in §3.4 and §3.5.

The large encompassing senses for intentionality will not be used again. From here on, only a skeletal and nearly contentless grasp of the notion of intentionality is requested for looking at the force found within modal sentences, particularly as these relate to syntactic expression of tense. There are intense intents in tense, albeit subtle at times. In the next section, a few more prefiguring linguistic constructs are addressed before a syntactic substitution is provided for these quasi-syntactic elements of intentionality and reflexion, that is to say, for the −→ and the .
3.2 Structural invariants

Invariance is an epistemological assumption that unchanging relations undergird some phenomena. The sentence is given the structure below following the original intuition that led me to seek out phenomenological methods for studying modality. This reduction fronted a generalized notion of subject and verbal inflection and took the form [SUB \text{NFL}[S]] in one of the early probes. It seems highly analogous to a 1966 conception from Benveniste (deduced from Kristeva, 1982:34-36) which could be read as [person tense [noun verb]]. The flux of contemporary Chomskyan structures since 1981 to the present seems to be converging onto this thirty-year-old pattern from Benveniste, although generative grammarians are accounting for a richer set of empirical phenomena and more complicated internal processes in the sentence. Their trees may place an [AgrP] (an agreement node rising from [DP] or [NP]) in the position where [SP] is found in the tree to the left. Chomsky (1993:45.10, 47.35) appears uncommitted as to whether the overarching category for nouns should be [DP] or [NP] and now introduces [TP] instead of the various prior forms of [IP], so this is enthusiastically adopted since the verbal inflection that is of interest to this project is tense. Chomsky also places an [AgrP] lower in the tree (but still outside [S]) for verbal objects.† This structure would apply either to a matrix or embedded sentence as in [We are ready \text{for John to leave.}] or the sentence from line 2.4.4 [Who do you want to see?]. It results in a conservative simple generalization from competing models that followed after Chomsky’s Government and Binding theory (1981) and also meets the phenomenological intuitions. The structure needs to be enriched for real language use but will serve here to indicate the extensions of [S] that can overtly appear in the extra-sentential positions of subject/topic and tense. Within generative grammar, there have been many labels offered for [S] and its immediate extensions, so the general idea here is to shy away from controversial issues which have yet to be resolved, especially when they don’t affect the research topic. No position is adopted here except to assert that tense is the head of the sentence inside the [CP] and grounds that category.

There are many theoretical complication that attach to establishing the nature of the sentence which will also be ignored. Chomsky’s notions for constituent command have a far more rigorous descriptive power that what is suggested by the simple construct outlined in §2.3. Under X-bar syntax and notions

† But an observation from linguist Rose-Marie Dechaine indicates that the agreement phrases are currently being dropped in favour of a more substantive nominative entity, also very satisfactory news.
for how empty categories and phrasal heads exercise control, movement and are chained together through upward migration in binary tree structures, a considerable amount of explanation is provided which these pages fail to acknowledge. The compound node under [Comp] serves as the site for the pronominal relative conjunctions (such as who, which, and sometimes that, etc.) which have empirical motivations previously mentioned showing they can also site empty or morphologically null pronominal elements. There are numerous developments for formalizing the facts about complementizers and subjects, which are not treated here except to indicate that these ‘topics’ come first within the [CP] ahead of the projection associated with the tense of the verb. Thus multiple elements might precede the infinitival structure as in [CP for John [\(\sim\) to leave]] or Churchill’s familiar noun modifier phrase, [DP something [CP up with which [S I will not put]]].

The structural invariants listed below may seem like mere stipulations but they are well motivated in theory which would require considerable space to summarize. Sometimes these are a possible part of Chomsky’s notion of universal grammar, sometimes just widely held assumptions.

**SI.1** Sentences always have a subject and something that is predicated of that subject. Thus even if the matrix [DP] is empty, as in an imperative like [Make John leave.], there exists a zero pronominal element representing the recipient the speaker intends, i.e., the pronoun YOU (singular or plural) matched up with what will be signified by [\(\emptyset\)], as [\(\emptyset\) Make John leave.]. [\(\emptyset\)] represents an morphologically null pronoun but retains the attributes of person, number and gender. In proper linguistic theory different symbols are used, with a fuller typology or phenomenology of numerous such Zen-like empty categories. Wherever an ellipsis or deletion has occurred, we can posit one or another of these traces, pro-forms or empty categories. The predicate, regardless of how small it is (there are controversies involved with what can be called “small clauses” in the predicates for the verbs of perception and causatives in Table 3.2) is posited to always project an inflectional element, that is here called [Tns].

**SI.2** FL categories fall into binary relations. This may not be true but it is a simple first assumption. Cognition readily falls into this pattern, and rather than being a submission to any tyranny that everything should be subject to computational switching by zero and one, perhaps it is just likely that we can only make our choices from two items at a time. Thus phrase structures won’t be shown with ternary branching. Early in Chomsky (1981:25) we find [S] \(\rightarrow\) [NP INFL VP], but the trend now tends more to binary structures such as [S] \(\rightarrow\) [DP IP].

**SI.3** Any syntactic category has a head, and it projects to the boundary of its phrasal category.

**SI.4** [Sub] and [Tns] comprise two projected heads from [S]. [Tns] is the head of [TP].
SI.5 Whatever the syntactic category or referent of infinitival TO is, it comes out of \([5 \ [IP \ [VP \ [V]]]\].

What Chomsky (1981) called \(\text{INFL}_0\) for the untensed inflectional object that is the referent of infinitival TO will here be called \(\text{INFL}_0\) because it is clear that what he means by \(\text{INFL}_0\) may not be generalizable to the applications in the next section. Facts about modality are described by traditional descriptive grammars, but receive little treatment under more dynamic but less complete Chomskyan frameworks.

Linguists have found it very difficult to properly define the elements of language. To properly know what a phoneme is, what a syllable is, what a word is, what a sentence is, none of these primitive categories have yet received a definition that fully satisfies philosophical and scientific requirements. All of these primal elements are used with rigor by language theorists, their central syntagmatic locus is known, but the enveloping functional 'space' or boundary of these categories is fuzzy and problematic. In recent years, the assertion that 'all grammars leak' has become common. This work tries to bypass these problems and assume that basic ideas found in standard texts and dictionary definitions will mostly serve. The complexity is due in part to our inadequate understandings of the differences between mental processes and physical ones, and the fact that language, subtly and intangibly, bears a burden in entwining both of these aspects. Discovery of the precise character of these atoms would be very valuable, but the absence of this knowledge should not fatally compromise discussion in the meantime.

The next section concerns two historical processes. Over 2500 years ago, the precursor forms to our modern modal auxiliary verbs were formed. The fashion of their formation seems outwardly similar to contracted forms we use in daily speech in terms of the modal operator that results. These historical notes inform the notion of embedded syntactic intentionality used for describing the phenomena of some of the forms of English modality.
### 3.3 Two historical notes about modal verbs

In informal speech, we hear forms that are not, and likely never will be, present in written language. English spelling began to coalesce with the advent of written Old English dating back to the ninth century C.E. The spelled forms began to solidify more rapidly into more recognizable 'modern' English with the advent of print and the first dictionaries after 1500 C.E. But spoken forms continue to seek the quickest means of moving the signal, and among many other economies of speech, contractions of infinitival TO arise that are phonologically conditioned by the last consonant of the preceding verb. Compare WANNA, GONNA, HAFTA, HASTA, etc.† It is not an unreasonable hypothesis that modern spelling of these verbs would resemble such 'misspellings' if the orthography hadn't frozen and exerted its controlling influence on 'correct' speech. In the case of English, evolution is towards a simpler morphology but richer vocabulary. (The loss of the extremely rich inflectional morphology of Old English is mostly attributed to the collision with eleventh century Norman French which marks the transition from Old to Middle English.) The focus here is the embedding of infinitival TO into the verb. This creates a form which patterns exactly with other modal auxiliary verbs. These invoke irrealis: the case of (BE) GONNA yields substitutability for WILL; the forms HAFTA/HASTA/GOTTA substitute for MUST; some senses of HADDA fill in for WOULD. The whole set of facts is more complicated than this brief outline, but this selection of examples show the construction of modal verb equivalents.

A second older event, with an interesting similarity, is a transition circa 1500 B.C.E. when the precursor verbs of some of the modal auxiliary verbs of Modern English were formed.

<table>
<thead>
<tr>
<th>OLD Infinitive</th>
<th>Present 3 Sg</th>
<th>Present 3 Pl</th>
<th>Preterite Sg</th>
<th>Preterite Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>to avail</td>
<td>(*deogan)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to know</td>
<td>(*&quot;2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to be able</td>
<td>(*magan)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to be obligated</td>
<td>(*sceolan)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEW Infinitive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to avail</td>
<td>dugan</td>
<td>degan</td>
<td>dugon</td>
<td></td>
</tr>
<tr>
<td>to know</td>
<td>cunnan</td>
<td>can</td>
<td>cunnon</td>
<td></td>
</tr>
<tr>
<td>to be able</td>
<td>magan</td>
<td>maeg</td>
<td>magen</td>
<td></td>
</tr>
<tr>
<td>to be obligated</td>
<td>sculan</td>
<td>sceal</td>
<td>sculon</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.1 Forwarding older Old English past forms to create modal precursors‡

† Formal explanations for which consonants are involved and where this phenomena is blocked are available in many basic linguistics texts. See also the classroom activities available in Honda and O'Neil.
‡ The asterisked forms under the old infinitives indicate reconstructed forms, not a lack of grammaticality. Professors Gernot Wieland and Laurel Brinton are thanked for vetting this table and checking the associated probe in Appendix A.3 for acceptability. Responsibility for any factual errors or misinterpretations lies solely with me.
This table follows the form of its origin in Cassidy and Ringler (1971:78) but adds three more examples to the original *DUGAN* (now demised, meaning *TO AVAL*). The old forms are preterites (or past) tenses which 'moved forward' into the present tense. This category is called *preterite-present*, a larger group than the few examples in Table 3.1, including some verbs now defunct. These verbs had perfective aspect but acquired a present meaning, sometimes called a 'weak' present meaning. The perfective aspect is the sense of completion, as the [past] is 'perfected'. The [past] is done, never doing. As previously noted, [Asp] and [Tns] exhibit related or complementary inflectional roles.

Also patterning with these verbs, *CUNNAN, MAGAN, SCULAN*, now the present tense modals *CAN, MAY, SHALL*, respectively, is the defunct *WITAN* (TO KNOW, from its perfective form TO HAVE SEEN; the noun form WIT is still with us), and the precursors of *DARE* and *NEED* which are occasional modals still. Quirk and Wrenn (§134) add that during the Old English period "the subjunctive came to be expressed more and more by means of the 'modal auxiliaries'" *WILLAN, SCULAN, MAGAN*, and the precursor of *MUST* due to loss of morphological distinctiveness during that period. Modality is closely aligned with the use of the subjunctive which evokes irrealis just as actively as the modals, albeit in a more poet form. Verbs in English which take subjunctive complements (i.e., the embedded clauses in bare infinitival form) are a 'cognitive' group which depend on matrix verbs such as *DEMAND, REQUIRE, INSIST*, etc. The subjunctive is marked by the fact that the third person indicative affix -s can be absent, as in [*She demanded that John leaves*]. Subjunctive complements may also be in overtly indicative forms or use modal auxiliary verbs, but they retain subjunctive sense (Curme, 1947, §41, §112-116). The subjunctive uses a very similar set of verbs in the Romance languages (e.g., Spanish and Italian) always exhibiting an irrealis invoking character: about states or events desired, demanded, hoped for, suggested, and so forth.

The antecedents of *WILL, BE, GO*, and *DO* are among the most anomalous (irregular) of all the English verbs. Their discussion is connected but would add considerable detail and complication. The auxiliary verb *DO* has clear modal contexts in addition to other rich behaviours such as being a causative verb and the 'empty marker' for moving [Tns] into a pre-[S] position in order to form questions. It also appears in negation. Negation in symbolic logic is instantiated by the introduction of an outer framing propositional structure (an outer envelope of *NOT*) to show when the scope of negation operates over [Tns] and thus takes in the whole of the targeted sentence.

A relation may also exist in the mechanism whereby some verbs became embedded causatives verbs. Think about the difference between *FELL* and *FALL*: 'to fell a tree' is 'to cause a tree to fall'. So-called -*jan-presents* — denoting an old infinitive suffix in verbs — remain visible in the pairs *SET/SIT* and *RAISE/RISE*. These may be seen to have absorbed a 'propositional quality' which presents a striking analogue with the 'forwarded' quality in the modals. Though the formation process was different, the referent of *INFL_0* again figures somewhere in the phenomenal substrate.
Again, the complete set of facts is less straightforward than what is so briefly outlined in these paragraphs. Some of these processes should be discussed as ancient mutating phonological processes but a commonality can be observed in that the modern inheritance of these processes has leveled to performance which makes use of infinitival forms. Modern phonological theory might provide a different and better foundation for doing this kind of phenomenology of language.

Because we cannot directly apprehend the syntagmatic ground of these non-finite complements, in many cases, variations (eidetic reduction) can induce the infinitival marker. One simple way to do this is to change subjunctive and causative forms into the passive. Taking apart a large grammar such as Jesperson or the usage entries from the OED could be used to generate a massive number of examples. The passive is in a state of near-identity with its active form, but it again highlights the difficulty of defining terms we may think are already clear, in this case, subject which is converted to a new focus. Perhaps some other interpretation will better serve your understanding of the passive/active relation, but it may not be easy … mystery can be found anywhere in these primordial syntagmatic categories. Applying the passive to the familiar [John leave] from earlier lines 3.1.1.2, 3.1.1.5 and 3.1.1.6, we can observe the effect on the subjunctive and the structurally similar categories of causatives and verbs of perception. Please note that the subjunctive can exhibit an extremely rich set of classifications. Curme (§114) would call [Let John leave] an optative subjunctive. The subjunctive’s large set of modal forms would only be well-served by many pages of treatment, but the generality sought is irrealis. Curme §112: “The past subjunctive rarely points to [an irrealis in] the past. It refers to the present or the future as regularly as does the present tense. … The past subjunctive suggests doubt, uncertainty, while the present subjunctive implies more hope.”

3.3.1 The schedule required that John leave. (Did he?) Subjunctive form (from line 3.1.1.2)
3.3.2 → John was required to leave (by the schedule). {insist demand mandated suggest}
3.3.3 (Someone) saw John leave. Verbs of perception (from line 3.1.1.5)
3.3.4 → John was seen to leave (by someone). {see hear feel behold notice watch}
3.3.5 (Someone) made John leave. Explicit causative (et al.) forms (3.1.1.6)
3.3.6 → John was made to leave (by someone). {make have let bid (old) did} (but not cause)

Something special happened to the precursors of modal verbs that makes them modal. Because of their unique behaviour, something special needs to be said. This is the query that was given to the probe question P.3 in appendix A.3. No direct answers were received, although some useful incidental corrections were provided regarding chronology, verb forms and better source materials.

† Phonological categories more closely track with the stream of percepts or physical primitives in the pipe of Figure 2.1. This might lead to improved isolation of semantic aspects in a fashion that syntax can’t deliver.
In Germanic languages, modal verbs have a markedly anomalous role. They are sometimes described as having a weak present sense. They express some acquired perfectivity, a quality of closure, but in this case frequently they can’t obtain it, since the invocation is into the domain of irrealis. The present tense is sometimes described as finite but perhaps, like its ‘physical’ correlate in the elusive temporal now, we are never quite on it and fragmented or disjoint and mentally lagging, chasing or spanning. The present tense also is necessarily used for statements about what is existential [John is here.] or transcendental [Two and two is four.]. As an a priori, we have a need to express the inactual, and that entails breaking with the existential into desired or considered transcendents. But that’s not saying much so this is inadequately descriptive and certainly has no explanatory value. But explicit changes can be observed in the historical record — and somewhere therefore in the re-ordering and underlying intension-filled ground of syntax — and this is manifest in the acquisition of a syntactic break distributionally associated with an overt or underlying syntagma for infinitival to.

The next section outlines the spectrum modality and notes what portion of it might reasonably be fitted onto [Inf_{0}].
3.4 A narrowed definition for intentionality

The notions of subject and predicate are both useful and venerable, dating back some millennia. We inherit Latin grammatical categories, which have been applied to English since the Renaissance and earlier. Despite the high level of functionality in the subject/predicate dyad, these do not deliver categories that are absolutely reliable or impermeable. Traditionally, the view is that any sentence may be decomposed into the two categories of subject and predicate. Symbolic logic similarly uses subject and predicate as primitive categories for its representations. Franz Brentano described the psychological construct of intentionality as a relationship between a subject and predicate.

\[
\text{sentence or proposition} \quad \text{[subject} \quad \text{subject and predicate} \quad \text{[predicate} \quad \text{usually break a sentence into two parts.} \quad \text{]}
\]

Figure 3.6 [subject \text{^} \text{predicate}]

Because of the difficulty in defining even these terms, Brentano’s notion won’t do, even though it does capture something significant. Not all sentence elements can be made to fit into categories without making poorly motivated decisions. In the sentence above, the adverb usually is adjacent to the verb and thus may be considered to modify it. But many adverbs float through sentential structure and in this case usually could be at the end or the beginning of the sentence, intersected with a comma. Many adverbs, particularly temporal or logical ones — such as soon or possibly — are sentential operators, i.e., modal operators. Further, a sentence can have an overt subject, logical subject and grammatical subject, all three of which can be different words, or absent, but implied. The notions of subject and predicate fail to capture some facts about sentences.

But Brentano’s assertion is of interest, at least for its grammatical flavour, despite the fact that it may not convey much information directly. Returning to the cogitatum (the white piece of paper of §3.1.3), the hermeneutic position tells us that such a reflexion (token, object, focus, etc.) always has a context, in fact, a possibly infinite radiation of contexts, though we can only deal with these one at a time.† Brentano’s position is usefully broken down by focusing on ‘the relation between’. Chomsky (1981) provides a saving object for the apex of the Figure 3.6 with his notion of [INFL] using it to stand for the syntagma which makes the kernel of the sentence and thus shapes its shell. Later Chomsky (1993) enriches this with [Agr] for the sentence’s subject and object. Chomsky let go of the old sense of

† Thesis advisor Tony Clarke (UBC Science Education Faculty) indicates that neurologist Oliver Sacks might disagree both with this point and the perhaps correlated perceptual issue in the first paragraph of §2.1 (regarding only being able to select out one speaker in a roomful of talking people).
inflection (as in the "declensions and conjugations" of Quine, 1987:99), the senses for all the additive affixations and marks that accrue to all the categories of word modification.

As previously indicated, Chomsky (1981) uses the term INFL₀ for infinitival to's syntactic referent. This inflectional marker patterns with [ Tns ] in extending outside the verb phrase, but it is clearly different from the character of [ past ] and [ present ]. Again, because it is not clear if his use of INFL₀ can be extended to activities in this paper, INFL₀ is used in the table below. The use of the same zero symbol [ Θ ] for the empty subjects below and in previous examples is intended only for generality, and misses the finer syntactic details that contemporary theory provides. But it has some value in suggesting that verb and noun inflection, agreement markings, or subject and predicate are all properly of a single piece when instantiated into actual contexts.

<table>
<thead>
<tr>
<th></th>
<th>[s]</th>
<th>[dp]</th>
<th>[ip]</th>
<th>[vp]</th>
<th>[cp]</th>
<th>[s]</th>
<th>[dp]</th>
<th>[ip]</th>
<th>[vp]</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>T.1</td>
<td>It</td>
<td>Tns</td>
<td>is necessary</td>
<td>that</td>
<td>John</td>
<td>INFL₀</td>
<td>leave.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.2</td>
<td>It</td>
<td>Tns</td>
<td>is the case</td>
<td>that</td>
<td>John</td>
<td>Tns</td>
<td>has [s Θ] to leave.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.3</td>
<td>It</td>
<td>Tns</td>
<td>is required</td>
<td>that</td>
<td>John</td>
<td>INFL₀</td>
<td>leave.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.4</td>
<td>[Someone]</td>
<td>Tns</td>
<td>is requiring</td>
<td>that</td>
<td>John</td>
<td>INFL₀</td>
<td>leave.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.7</td>
<td>John</td>
<td>Tns</td>
<td>has</td>
<td>-</td>
<td>Θ</td>
<td>to</td>
<td>leave.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.8</td>
<td>John</td>
<td>Tns</td>
<td>is required</td>
<td>-</td>
<td>Θ</td>
<td>to</td>
<td>leave.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.9</td>
<td>John</td>
<td>Tns</td>
<td>must</td>
<td>-</td>
<td>Θ</td>
<td>INFL₀</td>
<td>leave.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.2 Targeted sentence structures

Table 3.2 asserts that [ INFL₀ ] occurs in those same original contexts where infinitival TO would be normally expected to appear, but as a consequence of historical and economical reasons, it does not. This may make an excessive and unacceptable assertion within the apparatus of contemporary syntactic theory, since it generalizes across sentence types where theories may yet be insufficiently motivated.

Whether this last paragraph can be maintained depends on better theory than what is present in these pages, but the assertion is made by inspecting the irreal character that envelopes [ John/Θ - leave ].

This is also informed by the semantics of infinitival to which can be followed in appendix A.4. Critical to this inspection is recognition of capacity of infinitival to to deliver either progressive or perfective aspect to its grammatical object and thus variously entail the relations associated with both
Towards and actually to (as if it were both verb and preposition-like). Another relevant notion is the idea of gradience, suggested by the graphics below.

![Figure 3.7 Four variations on gradience](image)

The use of the term **gradience** (i.e., the quality of a gradient) may be original in linguistic contexts to Dwight Bolinger. I'd first encountered the term in a psychological context concerning perception, and later in Bolinger's discussion of verbal behaviour. The OED-CD has only one entry for the word in the definition of **morphemics**, citing his book, *Generality, Gradience and All-or-None* (1961, The Hague: Mouton) but, because this single use is in a cite for another word, there is no definition.

Coordinate with the effability problems mentioned in Chapter 1, and being mindful of warnings like Goethe's that "where sense is missing, words may be found to take its place" some exercise on this matter might be appropriate. Modal auxiliary verbs exhibit gradience, perhaps most clearly in the alethic and epistemic modalities (see the notes under Table 3.4). Most clearly, [contingency possibility probability doubt] present slices of gradation about many possible events. The definitions for infinitival to in Appendix A.4 may be interpreted spectrally. We can observe the strongest of intentions devolving through various dispositional environments whereby they weaken and vanish, or conversely, we might see weak **tos** progressing to very strong ones whereby they then also vanish semantically. Happily, in the searches that tried to map out a first outline of the presence of notions for semantic emptiness (Appendix A.1) a number of interesting words about pure form or pure function arise. Now, having been exposed to some phenomenology, I find previously unremarked terms such as **grenzbegriff** that relate to

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† The earlier promise to avoid discussions about meaning is broken (again). [InflQ] is posited as correlative with the root matrix of many forms of modality, yet to assert associated notions of gradience, directedness and semantic emptiness for it is a paradox of ideality, not the only one of course, but one that lies at the bottom of this effort.
what I had described as a “horizon to cognition” in one of the early probes. The complete entry from the OED-CD follows below (slightly reformatted). Another caution is provided in the final usage note.

Grenzbegriff. Philosophy. [G., f. grenze limit, boundary + begriff concept.] In Kantian philosophy, a concept which shows the limitation of sense-experience; a limiting concept (also limit-concept, limitative conception); also, loosely, a conception of an unattained ideal.

[1787 Kant Kritik der reinen Vernunft (ed. 2) 310 Der Begriff eines Noumenon ist also bloss ein Grenzbegriff.]

[1893 P. Carus Primer of Philos. 98 The straight line must be taken as a Grenzbegriff, i.e., a conception which denotes the utmost limit to be reached by a certain operation.

1896 W. James Will to Believe (1897) 16 Objective evidence is never triumphantly there; it is a mere aspiration or Grenzbegriff, marking the infinitely remote ideal of our thinking life.

1908 Meaning of Truth (1909) xii. 239 The notion of an absolute reality inevitably arises as a grenzbegriff.

1941 Mind L. 309 Kant’s ‘thing in itself’, understood either as a transcendent real or as a Grenzbegriff, could be only a prolific source of error.

Further comment would likely not add anything constructive. The issue may reach an asymptotic limit here, dependent upon individual interpretations.

Pullum (1982) discusses the syncategorematicity of infinitival to and concludes that it is a verb. Syncategorematicity is used to refer to elements that are “introduced directly by syntactic rules, and not assigned to any lexical or grammatical category” Infinitival to is an object of long-standing dispute. Pullum concludes that it is a verb. He argues against it not being any one of verbal affix, particle, complementizer, preposition, AUX (a central phrasal category for handling auxiliary verb phenomena), or a tense morpheme. I do not find all of his arguments convincing, but his technique is attractive and covers much useful ground. His approach is claimed to be theory-neutral and he provides an example of good thinking in discovery procedures. Syncategorematicity is a very interesting issue; Pullum would assert that its attribution to an object (such as for some types of do) implies either bad or inadequate science. Chomsky and others have long been working on this problem, and it is not resolved in these pages. I am cautious about the entries for [lnfl] in Table 3.2 as I believe that Chomsky’s position is that verbs in such contexts can simply be tenseless, and although that is intended here by the use of [lnfl], there is more complexity to the relevant inflectional performances than what is described here so briefly.

Infinitival to certainly has some verbal qualities but it’s prepositional character can be stressed too. Historically it derives from the preposition to (q.v. Appendix A.4 for the OED historical notes comment and respondents’ assertions during data collection). Personally, I am uncaring about the category, the surrounding arguments provide sufficient solace. Infinitival to looks like a strong candidate, due to its singular peculiarities, for having its own part of speech. Other syntactic or special use categories have only two or a few elements (negation, tense, aspect, person, etc.) but only a few (the pro-form so, and the verb do?) manifest a syncategorematic syntagmatic element with only a single member. Infinitival to patterns frequently as a pro-VP or pro-IP in discourse situations: [ Do you want to leave. Yes, I want to. ] or [ Yeah, I wanna. ]. If one accepts that its referent is embedded in the modal

3 Intentionality and modality 71
contexts of Table 3.2, then it might be seen as a pro-CP. (In another quirky facet of the distributional facts about infinitival to, I notice that while trying to fix text in these pages — exchanging a finite (that-p) clause with a non-finite one — infinitival to would be selected and replaced with modals, gerunds, and conjunctions, or vice versa. Distributional facts again, only showing regularities about sentential position.)

Making use of earlier assertions, there is some commonality with many of the constructs used in this work to talk about sentence elements and intentionality and reflexion. An early formulation in this project asserted that the Mohanty division of labour of intentionality into intentionality-as-intensionality and intentionality-as-directedness would map onto [SUB INF [ S ]] in a phenomenologically satisfactory fashion. In the sentential phenomena which are the cogitatum in this work, the syntagma [ S ] is reflexion (while not neglecting that such may naturally decompose into many further objects and relations through the business of syntax). The notion of [ subject ] entails mostly intensionality (in the sense established for this chapter in §3.1 and §3.1.1) while verbal inflection whether as [ tense ] or as [ aspect ] is coordinate with the intentional or unintentional directedness of relations associated with the logical or grammatical (intensional) subject and its predicate. I believe the following figure has some value in combining these three constructs.

```
[ intentionality [ reflexion ]]

[ i-as-i i-as-d ]

subject tense [ NP VP ]
```

Figure 3.8 Mapping intentionality into a sentence

This outline of phenomena is intended as a flexible gestalt, as was grammaticality in §1.2. The protruding head of the SVO English sentence first has a focus or subject (the ego assertion, the named intensional entity-from-the-world) which is then followed by directedness (pointing, grounding, underdetermining) through tense to the sentential noema. Intentionality, whether as this ego-expression, or as the determining pointer of tense, is only found relationally, never as thing by itself. Regardless, [ lnfl ] could not be a thing, it is a indicator of an act of relation, a noetic move that can only occur between subject and cogitatum, or between subject and some desired predication for that subject. This seems unproblematic for the OED’s “To err is human, ...” and its substantive companions which take the purposive for. These are readily interpretable in a human context as [ For one to err ... ], and thus the OED’s remarks for denotation B.III seem ill-advised. Perhaps the semantics are harder to find in a sentence such as [ John plans to leave. ] where infinitival to is swamped by the cerebral plans (though perhaps sense is merely vacuously reiterated in such a context). Theoretically, the assertion of sense for OED B.III would problematically entail that substantives (here, a noun phrase) may have subjects as well as verb-like inflection, echoing Husserl’s interest in nominalization and Chomsky’s
transformational devices that permitted bi-directional conversions of [sentences <-> noun phrases]. This is another enduring problem with a companion caution that the interpretation of 'semantically empty' 'denotations' of infinitival To encourage a grammatical extremism which is impermissible under current syntactic theory. There is also available another division-of-labour between notions of grammatical meaning and lexical meaning, but where one of these leaves off and the other picks up is not clear.

Both of the representationalist components in Figure 3.8 for Mohanty's slogans (the i-as-i and i-as-d) are pointers to noema, the first one as [Agr] to subject and object substantives and then [Tns] to the action or relational ground of the [predicate], depending on the choices for instantiating these syntagmata. Thus, in a less language-bound form: [i-as-i i-as-d [®NP ®VP]]. The extreme outer boundary (the bolder brackets) might then be seen then as closer to the domain of the speaking or writing subject or cogito. Chomskyan theory of course provides better for the internal bindings and governance between the properly syntactic elements and the host of companions these may take. Heidegger provides a larger understanding that any such representations may be seen as an additive fallacy that has no part in "the unimpeded mode of everyday activity whereas Husserl's (and Searle's) mentalist intentionality is a derivative mode that occurs only when there is some disturbance" (Dreyfus, 1993:22). (Again, I think of this advice applied to the reduced world of language objects, and not within the full expression of phenomenology.) Further (Dreyfus, ibid.) states that any such intentionality presupposes being-in-the-world, a more fundamental form of intentionality that Heidegger calls originary transcendence, and that he claims is the condition of the possibility of both active and contemplative intentionality". Dreyfus (ibid.) now quoting Heidegger's Being and Time: "It will turn out that intentionality is founded in Dasein's transcendence and is possible solely for this reason — that transcendence cannot conversely be explained in terms of intentionality."

Do these words fill a gap where there is no sense (or where none is needed)? In this context perhaps Heidegger would make [progressive] -ING the ground of being before [Inf^0] triggers irrealis. Does his stance inform us as to why infinitival To can be known to be semantically empty? Does it speak to how we can make truth-bearing mathematical pictures for how bodies can be accelerated or overwhelmed by gravity (despite their having to traverse the infinitely divisible atoms of space that entrap Zeno's tortoise-chasing Achilles)? I think so. But this is notional address to the framing ground, while the better capture of useful interior description might be what arises by following Husserl's method of creating disturbances and seeking better arithmetic, then afterwards rejoining 'everyday activities'.

§3.5 follows and concludes this chapter with a larger perspective for the context that [Inf^0] belongs in, the expressed categories of modality.
3.5 The categories of modality

Table 3.4 provides a summary extracted from Palmer’s 1986 work. However, this table is a semantic classification and not the kind of syntactic description of forms which are sought in this work. The same may be true of most descriptions of modality found in speech act theory, but I lack a proper exposure to that literature. Regardless, there is some reasonable “autonomy” that can be sustained between these approaches. Part of the value of Table 3.4 lies in indicating that there is a dense mass of thought (or a thick accumulation of words) associated with the topic. Another value, in combination with an expanded set of exemplars such as that begun in Appendix A.2, is to encourage an appreciation of the great variety found in sentential modality.

The syntax, and not the semantics, of modality was the research target, and whether these can be agreed to show a valid pattern around the underlying irrealis trigger or correlate of $[\text{Inf}_0]$. Some of the syntactic forms for sentential modality could fall into a patterns like the beginning outline in Table 3.3 below. This table is by no means complete, or categorically sound.

| A. Modal auxiliary verb with overt subjects | [John will leave.] |
| B. Infinitivals with TO categorized as verbal, substantive, adjectival or adverbial complements | [For John to leave now would be a surprise.] |
| C. Indicative verbs taking subjunctive complements (without third person singular morphology) | [She insisted John leave.] |
| D. Indicative verbs taking subjunctive complements (with third person singular morphology) | [She hopes John leaves.] |
| E. Bare verb style such as jussive, imperative, etc. | [Leave. Let John leave.] |
| F. Expletive and infinitival TO and verb | [Oh, to see her face again!] (optative) |
| G. Optative and other related forms using modals | [Would that he were here.] |
| H. Explicit syntactic causatives | [Make John leave.] |
| I. Other forms that look like explicit causatives. | [Let John leave.] |
| J. Verbs of perception | [Jill saw John leave.] |
| K. Implicit syntactic causatives | {sit/set lay/lie raise/raise fell/fall} etc. |
| L. Sentential adverbs | (possibly necessarily potentially) etc. |
| M. that-p clauses | [DP IP [that [S]]] |
| N. Universal statements in the indicative | [Triangles have three sides.] |
| O. Other illocutionary forms (negative, interrogative) | [John left.] |

Table 3.3 Some syntactic forms for sentential modality

The that-p clauses of category M may include both C and D (this would have to be checked against Quine’s conception). Categories A, B, L and M, and to a lesser extent C and D, have considerable cross-over throughout Table 3.4 overleaf. The ‘use’ of $[\text{Inf}_0]$ applies particularly to categories B and F. If it
<table>
<thead>
<tr>
<th>+ will</th>
<th>- will</th>
<th>alethic</th>
<th>deontic</th>
<th>Austin Illocution</th>
<th>Palmer (and)</th>
</tr>
</thead>
<tbody>
<tr>
<td>jussive</td>
<td>J apodictive</td>
<td>necessary</td>
<td>obligatory</td>
<td>alectic</td>
<td>factive</td>
</tr>
<tr>
<td>compulsive</td>
<td>e necessitative</td>
<td>possible</td>
<td>permitted</td>
<td>epistemic</td>
<td>alethic</td>
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<tr>
<td>e obligative</td>
<td>s assertive</td>
<td>contingent</td>
<td>indifferent</td>
<td>deontic</td>
<td>epistemic</td>
</tr>
<tr>
<td>s advisory</td>
<td>p presumptive</td>
<td>impossible</td>
<td>forbidden</td>
<td>temporal</td>
<td>existent</td>
</tr>
<tr>
<td>p prepositive</td>
<td>e dubitative</td>
<td>verified</td>
<td>causal</td>
<td>bolomaic</td>
<td>( \pm ) will</td>
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<tr>
<td>n nortative</td>
<td>r potential</td>
<td>universal</td>
<td>evaluative</td>
<td>causal</td>
<td>( \pm ) tense</td>
</tr>
<tr>
<td>r permissive</td>
<td>s conditional</td>
<td>existing</td>
<td>declarative</td>
<td>conditional 1</td>
<td>( \pm ) aspect</td>
</tr>
<tr>
<td>s promissive</td>
<td>o hypothetical</td>
<td>undecided</td>
<td>expressve</td>
<td>conditional 2</td>
<td>( \pm ) gender</td>
</tr>
<tr>
<td>o optative</td>
<td>n concessional</td>
<td>falsified</td>
<td></td>
<td>conditional 3</td>
<td>( \pm ) number</td>
</tr>
<tr>
<td>n desiderative</td>
<td>intentional</td>
<td>empty</td>
<td></td>
<td></td>
<td>( \pm ) irrealis</td>
</tr>
</tbody>
</table>

Table 3.4 Some methods for categorizing the semantics of modality

Some usage examples are provided in Appendix A.2.

Alethic ("truth") modalities include the contingency, necessity, possibility or impossibility of something being true.

Deontic ("binding" concerned with duty and right action) modalities entail being forbidden, being obligatory or being permitted or allowed.

Epistemic modalities represent states of knowing, ranging over believing to doubting and being certain or probable.
informs categories A through J, given acceptance of the notion of active tenselessness was expressed in §3.4, then it is of some value. However, not all of these categories pattern as neatly as the selected sample used in Table 3.2.

This kind of understanding is not entirely novel. It must have been noticed in many places before that no properly context-substitutable definition can be given for a modal verb that does not contain infinitival to. Additionally, the future is traditionally called a tense, but the present (or past) tense character of its modal auxiliary is noted by everyone, as is the periphrastic version with go [John will leave. John is going to leave.]. It can easily be seen that, in this sense, there is no future tense; there is only modality that breaks off from an indicative base. The additional assertion with [InflØ] is that there are two inflectional syntagma in the modal verb, in the form of research question Q.4: [M] → [Tns V InflØ].

This formulation for a modal verb is antithetic to Chomskyan generative grammar. It may have been asserted before, but such an assertion is not in evidence to me.

There is no claim that [InflØ] relates to the construction of all forms of modality.

Palmer, at the end of his work, adds the categories of interrogative, negation, etc. (see the bottom of the right-most column of Table 3.4). These usefully include the morphological features that contemporary generative syntax has started to be able to incorporate. More continentalist scholars have long indicated the fundamentals of the traditional grammatical sense of inflection. Kristeva uses a broad conception of modality including “number, gender, person, time and space and mood” as well as suggesting Emile Benveniste’s (1966) Problems in General Linguistics, where Beneveniste addresses phenomenological subjectivity’s correlations with linguistic subjectivity reconstructing “the very system of subjectivity and temporality” “by studying the categories of person and tense” and “the category of the verb and the correlations of tense” (Kristeva, 1989:32-36) presaging, I believe, the directions that grammar is now taking. I see his approach as congruent with the effort to synthesize in Figure 3.8 and, thirty years ago, suggesting [person → tense → noun verb]. Or, alternatively, the arrows might point outwards in adjoinment. And, Benveniste’s use of ego now figures into my conception of the phenomenology of language. Kristeva (1989:254) also provided the only source material, along with James Edie, that conjoins Husserl and Chomsky into the same discussion. Regrettably, these references were not found until the very end of this project, and thus could not pursued with greater depth.
4 Observations

Summaries concerning methodology and data collection follow. Some of the observations and supported notions provided in previous chapters will be repeated. The formative character of this research will be discussed with an outline of an improved research strategy for achieving better results.

4.1 Participative action research and phenomenology

Originally, this thesis was about little other than methods and methodology. In Computing Studies in Education, I helped other graduate students use the Internet and other computer applications when these might assist their research. Excitement about the what the Internet promised, library cutbacks alongside the rise of electronic journals, seemingly boundless free information, and readily available computational tools to cull and search, to amplify a query by broadcasting it into the new kinds of linked academic and special interest communities — this flux looked opportune for doing research on the asking of questions and the obtaining of answers. Simultaneously, new questions were being posed about what it is to communicate face-to-face versus the constraints of ASCII-bound synchronous chat and asynchronous email and networked list services, Usenet groups and bulletin boards. The demise of the book was foolishly predicted on multiple occasions (not realizing its great physical virtues and ready hypertextuality).

From a vantage studying the educational applications of computers, this panorama looked ideal for applying the freedom of action research and writing up a comparison of successes in using these differing media. I had no idea how quickly the value of knowing the syntax for file transfers, telnetting, or gophering could become be useless as this machinery was rapidly buried inside higher protocols.

Probes were written for differing academic communities and posted to electronic groups that I’d been monitoring. A sample of these may be found in appendix A.3. The participative action research methodology was adopted and practiced. Definitions for action research vary but all action research is sometimes said to participative action research whereby the investigator is involved with the targeted milieu. The definition below seemed adequately flexible for transplantation onto research contrasting the conduct of queries through direct interviews, electronic resources and print media.

The process of action research was first conceptualised by Lewin (1952) and further developed by Kolb (1984), Carr & Kemmis (1986) and others. In brief, it consists of a spiral of cycles of action and research with four major phases: plan, act, observe and reflect. The plan includes problem analysis and a strategic plan; action refers to the implementation of the strategic plan; observation includes an evaluation of the action by appropriate methods and techniques; and reflection means reflecting on the results of the evaluation and on the whole action and research process. This in turn may lead to the identification of a new problem or problems and hence, a new cycle of planning, acting, observing and reflecting.
The basic assumption is that people can learn and create knowledge (1) on the basis of their concrete experience, (2) through observing and reflecting on that experience, (3) by forming abstract concepts and generalizations, and (4) by testing the implications of these concepts in new situations, which will lead to new concrete experience and hence, the beginning of a new cycle.

(Zuber-Skerritt, 1990:4)

Figure 4.1 is taken from the front cover of Zuber-Skerritt.
When early results led to German phenomenology, the cycle of action research abstracted into this figure seemed more and more appropriate. Formative research is entirely suitable to it. The methodology grants a sensible freedom: one may begin at any point within the cycle, observations and thoughts are gathered and settled, information is collected, strategy is decided, suitable action occurs which then informs improved understandings and the cycle begins again, and again. The probes were refined as I understood better how to ask some of the questions. The process would then be iterated to a point of satisfaction. But in this case, this last stage has not yet been reached. For one thing, the literature associated with the probe results became more interesting than the methodology so permission was obtained to revise the plan to express a more syntactic focus. And phenomenology loomed larger. Notionally compatible with action research, phenomenology provided extremely pertinent literature to support the thrust of the probe questions.

Phenomenology can be trivialized into just a name for observation, reflection or contemplation, or better, as Dennett calls it, “spirited intuition.” Action research may be summarized as merely an obvious codification for how we routinely go about doing something. I don’t believe these speak adequately to the methods. The notion of eidetic reduction and free variation can embrace (I believe) the observational necessities that underlie good science, and the heuristics of using native speaker intuition that is so essentially a part of the linguistic method. The action research cycle helped me to lay out a protocol of how to organize the conduct of this research. At one point, the chapter titles were Plan, Act, Observe, and Reflect, one to four, respectively, and that helped, but later that proved too procrustean as the topic evolved and exceeded my the original plan, The revised plan was more phenomenological.

† It's can't be just a manifestation of the old saw that to a person with a hammer in hand, everything looks like a nail. Phenomenology seems a fountainhead for any method that expresses an overtly cognitive approach to its topics.
4.2 Data collection summary

This section summarizes a few of the probe questions and results that either yielded references of special note or claims against the research focus of a probe question. Mostly, I found that the Internet portion of this research did not speak to the central issues in this research. The greater body of responses were of two types: asking for the results (though standard etiquette dictates posting data summaries back to the locales where the query was made), or indicating interest in the research and that the respondent was doing in some related activity. In many cases, this information was judged to be ‘outlier data’ and not pursued, though it was acknowledged, and summaries will go to all persons in a week or two, as well as back to the lists and Usenet groups which were queried. Generally, I received vague concurrence, and requests for references or summaries of results. (My experience is not the same as other Internet-related projects. There is much that could be said about what kind of projects can work, and how to go about them.) More recently, the new web search engines (and the profusion of persons designing their own spaces) have radically changed the complexion of the Internet, providing new leads to researchers of interest and an easier means for locating and obtaining archived papers and electronic journals.

Part of the use of electronic resources was to use the “tight single word” INTENTIONALITY in every online library, resource and database that I could find. That helped to acquaint with the range of literature (so much of which I haven’t read or found to be above my level) and helped the probes move from a neophyte to a junior level. This activity won’t be summarized here, except to say that it reinforces the formative character of this work, and provides some bibliographic foundation for further studies.

The interest was of three types: references to material that I could access, agreements with probe contents, or claims that negated the probe or some aspect of it. I was sent academic articles by mail from multiple locations in Europe and North America and could have received much more if I hadn’t moved to focusing on book and journal literature.

Often the data collection immersed me into problems that were beyond my experience and knowledge to handle, thought these were also obvious facilitators for learning. At first, I thought that I could just communicate simple constructs on the order of ‘look at these two things: here’s Chomsky’s INFL0 which is functionally unpositioned with respect to modality (where it really seems important), and secondly, here’s Husserlian intentionality, which if stripped down to a confined domain of verbal modality seems to fit really nicely with what infinitival TO seems to mean’ (despite other problems noted in the

† The names and affiliation of respondents, if given, will identify the information below (verbatim responses and email addresses can be provided).
preceding chapters). I found good probe questions hard to write, but the sophistication of discussion on the Linguist list and in the artificial intelligence groups informed me about what I would have to cope with and gave examples of some efforts that appeared to be working for others.

P.1 asks after a “narrow definition of intentionality for modal complements” and was posted to comp.ai, comp.ai.philosophy, sci.meta.tech, sci.meta.philosophy and the bitnet listserv Psycoloquy. This was one of the earliest probes. It is an example of a probe that is too wordy and without sufficient focus (and did not receive any useful information). I sent the references on intentionality-as-directedness to a few inquiring persons.

P.2 addressed the semantic emptiness issue and was posted to the Linguist list, comp.speech, sci.lang, alt.postmodern, and alt.usage.english. I received many requests for the summary results but no substantive comment on the issue. Looking through the hits from the OED searches (especially the technical terms that came up) provided the most instruction. I believe that this is a worthwhile topic, but its pursuit would require some reformulation.

P.3 sought comment on INFL0 in Old English modals on the Linguist list, comp.speech, sci.lang and alt.usage.english. Don Ringe (University of Pennsylvania) indicated that the Cassidy and Ringler model for preterite-presents is no longer current. They were verbs that were, and oddly remained, stative presents. He provided more information “cleaning up around the edges” but actually was more than that, and clearly, more study is necessary to bring the conceptualization of §3.3 up to acceptable rigour. Cynthia Allen (Linguistics, Australian National University) also indicated that better grammars are available than Cassidy and Ringler, and provided corrections of verb forms and the chronology. There was some contradiction between these responses, so I decided to hold with the basic form of the probe as vetted by two local Old English scholars, with minor corrections.

P.4 and P.5 obtained the most responses. P.4 asked the Husserl list readership if the structure in §3.1.4 presented as [ intentionality [ reflexion ]] was acceptable. P.5 was posted to the Linguist list with the subject line “Modality, intentionality and infinitival to”.

Other probes were issued to these and other targets but these four are representative. Because of multiple postings of the same probe to different groups, it was frequently impossible to determine where a respondent actually saw the posting. Some of the substantive responses follow below.

Dr. Marvin Minsky (a seminal figure in artificial intelligence research) sent a response which included:

I’m curious about why you’re pursuing this. It seems to me that the intentionality theory is sort of silly. It assumes a relation between the thought and the object, but it seems to me that a more modern concept of the brain would suggest that no such thing can, or need exist. Instead, the processes in, say, your language brain centers are dealing with signals and symbols of activities in other brain centers that they’re connected to. Those in turn have as their 'objects' yet other brain activities — and so forth. This leads to brain centers that deal with (visually) activities to areas 19, 19, 17, the colliculus, and so forth right
down to the retina. Intentionality doesn't exist, but it is a fine commonsense, naive idea that is OK for casual social activities. Similarly, we're not reflexive at all. What we call being aware of ourselves seems to me superficial; what you know about yourself is the content, mainly, of painfully and artificially constructed mental models. So with all due respect, I think you're getting trapped in a bad mess of unsophisticated idea. You remember the comment about dismissing a physics theory by saying, "why it isn't even wrong". In the case of intentionality, so far as I can see, it *is* wrong. There's simply no such thing.

Dr. Minsky's quote is too small to do justice to his full stance available in his extensive publications. Churchland (1984) would be a good supplement to this eliminative materialist position. I responded primarily with the notion that I was examining strictly language-bound structures including some references (e.g., Mohanty on the two types of intentionality). Given another chance now, I would indicate more clearly to him, that I am not seeking after the traditional sense of intentionality as a relationship between thought and object, but instead looking at 'relations' between indicative mood and intensional complements tending to irrealis (and other sentential environments that pattern similarly). Again though, a phenomenological perspective on grammaticality applies: a "syntactic form enabling connection to a real object" (Kristeva on Husserl, 1989:254). But I don't know if Dr. Minsky would concur with this notion. Dreyfus (1982:19-20) draws a deep parallel between Minsky's epistemological effort and Husserl's, suggesting that it is "the same 'infinite task'" of construction.

John Snyder (affiliation unknown) in a clever comment on probe P.4 said that he thought the research project was a "fur teapot" (a reference to a famous work of sculpture by surrealist Marcel Duchamp). Rich Hilliard (Intermetrics Inc.) provided a complementary intuition to P.4 in that he saw the relation as [ reflexion [ intentionality ]]. This was incorporated into §3.1.4 in line 3.1.4.2 leading to Figure 3.4b.

Dr. Barry Smith (SUNY Buffalo, editor of The Monist,) expressed interest in the use of Venn diagrams and sent me some very challenging material on quantification and mereology (the study of parts and wholes) with serious Husserlian underpinnings that I was not able to incorporate into this work, but now begin to understand. Dr. Smith's work takes a very attractive stance and I will pursue it.

Dr. Bill Croft (University of Manchester) expressed reservations about the topic stating that he is "not sure that you can directly tie notions of intentionality to specific parts of language" and suggested that I “not look at Chomskyan categories, which are posited without any reference to (or interest in) their semantic contents.” He made a strong recommendation for the “quite difficult” cognitive grammar of Ronald Langacker (who “writes not unlike a German philosopher”). “While I don't think that what you'll find is the literal implementation of intentionality that you're looking for, I think you will find Langacker's description couched in a model of conceptual structure that is amenable to reinterpretation in terms of (transcendental) phenomenology.” I found that Langacker's grammar also posits tense as the underlying ground for the sentence but this theory in depth past that due to time constraints. Langacker uses a very figural method for diagramming sentences (boxed curves and delineated spaces) and I would
require more time to fold his methodology into this work. His work is discussed on the COGLING list so I resubscribed to it and sent probes. More reference material turned up but little was of avail beyond Paul Deane’s Grammar in Mind and Brain and some others that look appealing. The most useful responses came from the Linguist list, the Husserl list and the Usenet group comp.ai.philosophy.

Dr. Noam Chomsky, responded to a late, rather exigent probe (email actually, labelled P.6 in appendix A.3). This was written at the end of the thesis when deadlines were making it plain that I didn’t have much electronic data collection that really spoke to the research questions. Further, and much more disastrously, before the Dechaine information that allowed a dropping of the various [AgrP] nodes, trying to incorporate Chomskyan primitives into the ‘phenomenological’ forms was proving very difficult. His very modest response doesn’t say much directly (though Chomsky has been thinking about infinitival structures in print since 1957, and probably from the outset of his career; infinitivals are a major sentence structure, everyone who studies languages in any form, must think about them) but does reveal aspects of his methodological stance which evidences caution, collaboration, and care.

I wish I had something useful to say about the project you are working on. Crucial to it are things I honestly don’t know much about. There is work, which perhaps you know, by Eric Reuland (now in Utrecht) and others on these specific topics, and other related ones, including my colleagues here, Alec Marantz and David Pesetsky. You might want to contact them. They could be much more helpful than I can.

These references are placed with other bibliographic materials for a reformulation of this project.
4.3 Summary and omissions

The first chapter is merely framing and introduction. Chapter Two is a very mixed result. It has little theoretical value and mostly plunders constructs from better systems. At best, I thought it was a sophomore’s attempt at an elemental relational syntax of the most basic Husserlian syntagma (which I would then use to motivate an approach to modality) but under another perspective, it seems to inform nothing, except as an example of an exercise that dead-ends. It was a good exercise to begin for me privately, but needs re-evaluation. The last chapter of this work was rushed and needs expanding, deletion and other improvements. A fresh start on this project might include conflating the first three chapters into one, dropping the introductory material (which was intended for a science education audience) and redesigning the research questions into a concise series of statements that would aggressively permit opportunities for their denial.

The inclusion of verbs of perception and the overt causative constructions is overly ambitious and interpretively very hard. I chose the past tense forms for Table 3.2 as they are toughest to claim irrealis for (except in the shiny membrane of ideality associated with a ‘cognitive apprehension’). Present tense is easier as the present tense easily conduces a ‘ground’ of atemporality.

A list of appropriate studies to help remedy epistemological weaknesses would begin with reading Husserl’s Formal and Transcendental Logic, which, per Edie, provides a tight distillation of Husserl’s Logical Investigations with useful grammatical explorations. Modern phenomenological literature should be examined as well especially the thoughtful views of Dreyfus. I did look at Merleau-Ponty and Derrida but did not find their work to be applicable, though I may have missed their positions, as well as that of many other eminent persons. Pursuing Kristeva’s and Edie’s bibliographies is recommended (as well as trying direct correspondence). A proper address to Dennett’s heterophenomenology did not occur and that must be remedied. I obtained John Searle’s work (notably his book Intentionality) but did not incorporate it (its foci seen as philosophy of action and causality from a semantic point of view, etc.). But his work is a cornerstone for the topic of intentionality and so must be addressed properly, as should Quine’s behaviourist position. I also am not nearly adept enough with contemporary Chomskyan grammar, and the recommendations towards Langacker’s theories require more effort than they were given. Hans Reichenbach’s approach to understanding tense is intriguing, as well as his overall philosophy of grammar, an analysis of which (McMahon, 1976:97) shows a diagram about the development of the word class system that shows PRONOUN and ARTICLE branching off from one Stoic category ARTHRON (Greek “joint”). This is a very intriguing and syntactically and phenomenologically satisfactory historical move, if true.
Other foundational knowledge that might help definitively is the study of modal and tense logics, as well as seeing some state-of-the-art grammars under computer languages such as Prolog and its kin.

Some related concluding apologies are due the reader. Heading a long list of neglected tasks, reflected in many places throughout the preceding sections are repeated errors in form and word. Use of the terms syntagma, syncategorematicity, noema, inflection, and many related others could have been aided by providing a list of synonyms and definitions, and then the text reformed by the use of only one term. A particularly untidy term is category, (especially with respect to separating entities from relations) which can almost hide what needs to be said. Early plans to provide a glossary and index links were not implemented, a greater regret, since these would have forced a more consistent and coherent use of language into the work. The later Husserl uses noema in a way incompatible with the previous chapters (Dreyfus, 1982:2, “the abstract structure by virtue of which the mind is directed towards objects”). This makes for numerous changes.

Some etymological work on infinitival to was not included in these pages. There are some notes from the OED-CD, other parts of the material were not that revealing, except about its prepositional history. The parallels between sentences/CPs/TPs/IPs and determiner/noun phrases should have been pursued. There is some formal congruency in the [comp/subject/object tense/aspect [DP IP]] shape of sentences with the [±definite/quantifier topic/subject [D {AdjP} NP]] of substantives. The use of participles and infinitivals in DP/NP positions was not pursued, though there is undoubtedly much literature on this. The situation with the pre-Germanic statives needs to be determined with better clarity, or at least try to outline what is intractably confusing. Imperative forms were not addressed except to make the traditional observation that they have an unspoken addressee. Clearly, their complements are in irrealis, otherwise there would be no need to ask or demand. They don’t seem too problematic to place into Table 3.2, but like some optatives, they are just ‘out there’ in irrealis without bridging first from the base ground of the indicative mood. Certain conjunctions (logicals as if, unless, given that, etc.) also rupture in this fashion, without indicating where they have broken from, except in a compound structures, where it would be the ground of the appropriate premise. Noah Webster (in the forward to his first 1828 dictionary) said that he thought if was basically an imperative verb related to give.

Material from Edie about how sentences (and thus CPs, etc.) are categorially different from other word grammar categories was not included and should be worked on (Edie, 1987:44-45).
4.4 Conclusion

There are perhaps too many research questions, but they have close notional connections making their address in this thesis easier. As mentioned previously, this project needs to be redesigned with a better grounding in literature and enhanced formal skills. Although the thesis was exploratory and formative research from the start, I did not know how elevated the theory associated with phenomenology and modality would be. Still, the original drives from intuitions mostly clustered about these focus questions, has, in my belief, left a position which is paradoxically both strengthened and bound by qualifications, and still fairly congruent with the original intuitions.

Research questions:

Q.1 Is the construct [intentionality reflexion] congruent with Husserl's notions?
Q.2 Is there a coherent relation between grammatical tense (verbal inflection) and intentionality?
Q.3 Is it coherent to assert dependency between objects like \{infinitesimals lnfl\} and modal expressions?
Q.4 Is the rule [M] → [Tns V lnfl] acceptable in decomposing an English modal auxiliary verb?
Q.5 Is it false to maintain that a denotation for infinitival to can be semantically empty?

Q.1 I asked Dr. Steven Taubeneck, a Heidegger and Germanic studies scholar with strong interests in contemporary philosophical issues, if this notion was an acceptable interpretation of Husserl. His affirmative answer encouraged me to continue this exploration with him as a advisor because of his knowledge of the phenomenological tradition and other relevant disciplines. I interpret Dr. Barry Smith's provision of literature as supportive. Fur teapot or not, the construct provided functional consistency in the elaborations progressing through Chapter 3. The construct has the virtues of simplicity and ready availability to elaboration which (if grounds or warrants can be established) could demonstrate useful mapping with other notions.

Q.2 Rephrased as "syntactic intentionality-as-directedness" and viewed within the framework of this thesis, this seems to be a useful relationship. No refutations were found, but neither was it communicated very widely. It is useful (granting either the objective existence of intentionality, or its 'local' existence confined to the construct of the English language, that is, a human language) to see this relation as an illustrative representation which supplements the role of verbal inflection. Similar conclusions might be drawn for the relationship of a "syntactic intentionality-as-intensionality" in parallel with the Chomskyan formulation for [agreement]. A representationalist position as a constructive, but temporary, disturbance is entailed.
Q.3 Not clear. No acceptance was obtained for the construct \([\text{lnfl}_{0}]\). A method for determining its construct validity would need to be formulated. The notion of “modal expression” is not applied to resultative operations with infinitesimals in any found literature. The intuitive attraction of an affirmative answer to this question for the author of this thesis is immaterial. The intuition remains that \([\text{lnfl}_{0}]\) (whether as a relation or an entity) is associated with the bulk of the heavy lifting in English modal activity. See the qualifications in the next paragraph.

Q.4 Yes, given acceptance of the assumptions and elaborations in this research. Following conventions used in this work, the structure would be elaborated to \([\text{Tns} \{ V \{ \text{lnfl}_{0} \}\}]\). But there is an enormous problem with it, because, as noted previously, it violates structural invariants that concern the assignment of one syntagma for verbal inflection to the sentence. The categorizations of tense remain confusing in the literature I have seen, though modern developments may be overcoming this. Tense receives attributions \([+\text{tense}]\) for \([\text{present}]\) and \([-\text{tense}]\) for \([\text{past}]\). Infinitival forms in Chomsky (1981) were assigned \([\text{INFL}_{0}]\) which I understand to be zero tense. A notion of a null tense or default tense might also inform this problem, but worse, that would make for not three, but four modes of (non-binary) attribution. Or, infinitivals may not properly relate to tense at all but to something entirely other. The small clause of verbs of perception and causative and other structures may also be something completely different from any of these (or related ideas). And some of these things may truly be nothing at all, just artifacts from poor assumptions. This is formative research.

Q.5 It seems like a weak position to hold with respect to functional elements of language, given that principles of economy exercise an unforgiving culling process on unnecessary elements. If I might be permitted a joke, maybe it survives (though empty) in the paradigm with \(\text{ought}\) because \(\text{ought}\) is phonologically so light, it needs some kind of ballast. If a notion of grammatical meaning is to be applied to a word like infinitival \(\text{to}\) then the user would be responsible for determining how it is that grammatical meaning has no intersection with a notion for \(\text{semantics}\) in the phrase \(\text{semantical meaning}\).

The research questions miss the question of what part of speech is infinitival \(\text{to}\). It looks a lot like a preposition, patterns like tense, and has both pro-form and verbal behaviour. I don’t know. I would like to try copying Pullum’s style in pursuit of this.

An overarching finding is that it is reasonable to see that intuition constrained by Husserlian eidetic reduction (or the method of free variation) can be a form of principled hypothesis testing of empirical (that is, perceptual) data. Following Taubeneck, Edie and Kristeva, I am persuaded that Husserlian (and Heideggerian) approaches usefully inform both the methodologies and the theoretical primitives
of language study by enabling theoretical stances that might infuse their category nature with more realistically cognitive relations, in that richer sense of cognition which includes the unconscious, and the emotive and instinctual.

The criticisms made of Chomsky — that his work is technicist, reductive and clinical; too bare of a proper incorporation of a phenomenological ontic for lived human realities — seem rather unprincipled when placed against the consideration that no one else has developed grammatical formulations that permit the coalescence of such observations. The grand traditional philological grammars of Jesperson and Bopp give a description of more grammatical facts but these are static pictures, whereas Chomsky's grammar moves like people move, and year by year it grows more dynamic by accounting for more languages and more sentential processes. On a broad view, Chomsky's socio-political work seeks better distribution of power, justice and information and is clearly rooted in care, while the theoretical inaccessibility of his grammar (operating bottom-up from the expression of single individual competency) seems to some like a denial of human-ness. But, were this a grand pincer movement, any slight closings would signal radical new conditions of possibility. (I abduct Steven Taubeneck's Kantian phrasing.)

Husserl's Ideas was the first book I'd encountered that sought deeply after intentionality in the sense I feel may be right. I see part of Heidegger's position as a rather nondualistic solution, possibly truer and more pragmatically useful for understanding overarching intentionality, but the Husserlian and Chomskyan approach seems best for the bottom-up approach of trying to find out some real mechanics. I know only a bit of phenomenology, and only now at the end of this thesis do I begin to read Husserl properly.

A interesting topic for further research would be to work for a clearer topography or phenomenography of semantic emptiness (given adequate consensus that this is a worthy research goal about something real). Another, possibly 'empty' research topic would be a similar tracing (or little dictionary) of the distribution of zero morphs, empty pronominals, traces, and other mathematically, phonologically or semantically null elements that seem to be distributed at pivotal interstices in the various FL. If there be actual ghosts somehow motivated and occupying these spaces, we should know the full names and lineages that attach to their apparently visibleambits.
A.1 Searches for semantic emptiness

The tables below are sample summaries of hits from sets of searches done in the Oxford English Dictionary (CD-ROM, 2nd edition) made available by the UBC Department of English.

The vertical bar ("|") indicates a Boolean ‘or’ relation. The asterisk (*) indicates that zero or more additional letters may precede or end the word (thus “defin*” will catch DEFINITION, DEFINE, etc.)

The numbers prefixed with octothorpes indicate the number of words that may come between two targeted search terms. In the case below, where five words may intervene between NO and MEANING, this may seem overly broad, but it was done for the sake of completeness and usually did not add very greatly to the volume of hits. This number was reduced in later searches. The list of hits was culled through and any words of interest were saved into separate files. Noise (uninteresting hits) primarily resulted from the proximity control (e.g., #5) generating hits across sentence boundaries, or from collocation of the search terms in an irrelevant usage entry. Some initially dismissed results were later found to be informative as research evolved. Many others were just interesting.

Some crude categories (a beginning phenomenography of semantic emptiness) could contain:
1. Overtly defined as semantically empty (one result remains in the OED: infinitival TO)
2. Nonsense terms, interjections and expletives serving to denote contentless attention (UM, BLAH, etc.)
3. Pronouns and proper nouns are sometimes defined as lacking any meaning of their own.
4. Horizon, boundary, limit, or other technical terms (FUNCTOR, KENEME, ANOEIC, GRENZBEGRIFF, etc.)

Group I:

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**Group II:**

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*11.1 just #4 mark*  
just #4 symbol*  
just #4 denot*  
just #4 connot*  
just #4 referen*  
just #4 mean*  
just #4 word*  
just #4 lex*  

*11.2 mere* #4 mark*  
mere* #4 symbol*  
mere* #4 denot*  
mere* #4 connot*  
mere* #4 referen*  
mere* #4 mean*  
mere* #4 word*  
mere* #4 lex*  

**Group III:**

- single words and phrases (some items suggested by search results)  
  30 searches

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**Group IV:** (needs to be redone)

empty | form* | function* | gramma* | lex* | logic* | structur*  
|-------|-------|-----------|--------|------|--------|-----------|

*3

mark* | symbol* | denot* | connot* | referen* | mean* | word* | lex*  
|-------|--------|--------|---------|---------|-------|-------|------|

56 searches
A.2 Examples of modal contexts

These two columns are Jesperson’s categories for modality. Where the paradigmatic [John leave] doesn’t communicate well, Jesperson’s examples are given in italics (from Palmer, 1986:10).

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<th>Containing an element of will:</th>
<th>Containing no element of will:</th>
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</thead>
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<td>Jussive: Leave.</td>
<td>Apodictive: Twice two must be four.</td>
</tr>
<tr>
<td>Compulsive: John must leave.</td>
<td>Necessitative: John must have left.</td>
</tr>
<tr>
<td>Obligative: John should leave.</td>
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</tr>
<tr>
<td>Advisory: John should leave.</td>
<td></td>
</tr>
<tr>
<td>Precative: Please leave (John).</td>
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<tr>
<td>Hortative: Let John leave.</td>
<td></td>
</tr>
<tr>
<td>Permissive: John may leave.</td>
<td></td>
</tr>
<tr>
<td>Promissive: John (says he) will leave.</td>
<td></td>
</tr>
<tr>
<td>Optative (realizable): May he still be alive.</td>
<td></td>
</tr>
<tr>
<td>Desiderative (unrealizable): Would he still were alive.</td>
<td></td>
</tr>
<tr>
<td>Intentional: In order that he may go ...</td>
<td></td>
</tr>
</tbody>
</table>

The use of modal auxiliary verbs is simple in practice but subtle and complicated in formal terms. A single modal may belong to multiple categories within either of Jesperson’s two broad categories as [John may have left by now.] and [John may leave now.]. These two uses may be seen, respectively, as presumptive and permissive, but this can vary further with the context.

Below find more examples of categories used for modality, including some forms of tense and aspect.

| Boulomaic: It is hoped/feared/regretted that John may leave. |
| Imperative: Leave. |
| Interrogative: Did John leave? |
| Subjunctive: |
| Negative: John did not leave. |
| We require that John leave. |
| Negative: John did not leave. |
| Future: John will leave. |
| Future perfect: John will have left. |
| Present: John leaves. |
| Present perfect: John has left. |
| Past: John left. |
| Past perfect: John has left. |
| Future progressive: John will be leaving. |
| Future perfect progressive: John will have been leaving. |
| Present progressive: John is leaving. |
| Present perfect progressive: John has been leaving. |
| Past progressive: John was leaving. |
| Past perfect progressive: John had been leaving. |
A.3 Probe questions

These probe questions were posted to the electronic discussion groups listed in the first line of each page. Differing queries were structured in an effort to adapt to the interests of groups with varying orientations.

For the most part these are serious areas of discussion with large audiences of professional persons who are academically or commercially concerned with theories of language, philosophy, or computational intelligence.
Subject: Narrow defn of intentionality for modal complements

Hello

A frequently used definition for intentionality is ABOUTNESS. I wish to inquire more narrowly after intentionality as a relationship between some verbs and their complements. This effort might be seen as a purely grammatical reading of Brentano's subject-predicate definition. I wish to narrow the relationship to a sense of infinitival TO-NESS.

Intentionality is frequently defined with a warning that the sense should not include notions of "deliberativeness" but this view of INF TO violates that constraint by ushering in speaker intentions. (Interpreting prepositions separately from their lexical content gives another narrowed definition of intentionality as intended relation.) I am working within an Husserlian understanding of intentionality-as-directedness, but an interpretation as intentionality could be used.

Please consider the distribution of complements in the following (with the hyphen standing in for an empty subject position):

1 John has to leave.  John has [ - to leave ].
2 John is required to leave.  John is required [ - to leave ].
3 It is required that John leave.  It is required [that John leave ].
4 John will/may/can/must leave.  John will/may/etc. [ - leave ].
5 Someone made John leave.  Someone made [ John leave ].
6 Someone saw John leave.  Someone saw [ John leave ].

No common label is asserted for the [complement] or '-' subject. Causatives and verbs of perception (#5, #6) will, of course, show infinitival TO when put into passive form. Regardless, the forms in 3, 4, 5 and 6 are bare infinitival forms.

Is there a better term for this relationship than "intentionality"? This seems to be a *strong* form of intentionality, but I wonder if there is a better label for this transitive carrier?

I am seeking repudiation or refinement for the validity of this narrowed sense for intentionality. This query is informed by the denotations for infinitival TO in the OED (III, 1-19) and the general Chomskyan construct for INFL as head and root of S within GB theory.

Do any thoughts, objections or qualifications arise in your mind? Any relevant analyses or references would be of value to me as well. I will summarize back to the list if there is interest.

Variations on this query exist on other listservs and Usenet groups. Please excuse any duplication.

Ken Hughes........Science Education, UBC........hughes@unixg.ubc.ca
2125 Main Mall, University of British Columbia, Vancouver B.C. V6T 1Z5 [Thesis on phenomenological interpretations of language constructions]
Subject: Semantic emptiness: search summary

Hello

I am interested in the validity of assertions which define some English words as semantically empty or devoid of meaning.

There is a sense in which proper names are devoid of lexical content. Pronouns may be viewed similarly. I view these cases as deictic and the following paragraphs will not address them.

Years ago I found dictionary entries for six 'function' words claiming that an utter absence of meaning is found within some definitions of DO, SO, BUT, THAT, WHICH and infinitival TO.

Recently, I decided to look again. 176 searches of the 1991 OED CD-ROM using [sufficiently?] rich variables and relations yielded about 18 interesting results. Email me for this 32K ASCII file if you want it. If there is interest, I will provide a succinct summary for this list.

By my criteria, of these 18 hits, only infinitival TO remains defined "without any meaning of its own" [OED Defn B.III.13ab-14b] and is thus the principal focus of this re/search.

INF TO in this denotation may be seen to bear grammatical meaning (i.e., the meaning of its function). More usefully, the word may be seen under the lens of a formal syntax (in another related inquiry).

Per the OED, infinitival TO in some subject or direct object positions [viz., acting as NPs or D-bars] such as in the following 2 clauses "To err is human, to forgive, divine." is semantically empty. Previous OED defns show little but saturated purpose and intention, then suddenly the sense progresses into a literal nothingness. Does anyone argue that INF TO in substantive position loses its inflectional status? ('Inflection' is used as per Chomskyan GB term 'zero inflection' and as the endocentric root and projection of S.) Perhaps the referent lies at or beyond the horizon of cognition? You know ... an architectonic sort of thing.

Are these statements or facts acceptable to you? Are you aware of relevant analyses that may help to wrest me out of this quagmire? I will summarize back to the list if there is interest.

Variations on this query exist on other listservs and Usenet groups. Please excuse any duplication.

Ken Hughes........Science Education, UBC...........hughes@unixg.ubc.ca 2125 Main Mall, University of British Columbia, Vancouver B.C. V6T 1Z5 [Thesis on phenomenological interpretations of language constructions]
Subject: Chomskyan INFLo in Old English Modals

Hello

I would be delighted if anyone proficient in Old English verb structure and GB theory would comment on the following diachronic interpretation.

First, there is the following historical movement (where strong Gmc preterits shifted to the precursors of contemporary modal verbs about 2000 years ago, viz., new preterits with weak endings):

<table>
<thead>
<tr>
<th>OLD Infinitive</th>
<th>Present</th>
<th>Present</th>
<th>Pret Sg</th>
<th>Pret Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>to avail</td>
<td>*deogan</td>
<td>3P sg</td>
<td>3P pl</td>
<td>deag</td>
</tr>
<tr>
<td>to know</td>
<td></td>
<td></td>
<td></td>
<td>cuthe</td>
</tr>
<tr>
<td>to be able</td>
<td>*magan</td>
<td></td>
<td></td>
<td>meahge</td>
</tr>
<tr>
<td>to be obligated</td>
<td>*sceolan</td>
<td></td>
<td></td>
<td>sceal</td>
</tr>
</tbody>
</table>

(Adapted from Bright's OE Grammar and Reader, Cassidy & Ringler, 1971.)

The old plural preterit provides a new third person plural and a new infinitive. Old past singular provides a new third person singular.

After a second stage of further morphological simplification, I assume this process uncontroversially provides some of our contemporary modals. Since something special needs to be said about modal verbs, could it be useful to view the resulting syntactic and semantic structure as:

- compounding both finite TNS (past or present) and INFLo into modal V? (INFLo perhaps dominates the finite tense component such that modals have different pragmatic (or sometimes no) rules about tense usage. Moreover, double modals are possible in some dialects.);

- seen as roughly parallel forms with encliticized compounds such as HAPTA, GONNA, WANNA, GOTTA, OUGHTA, et al. (which are blocked from orthographic adoption by 'literacy' and spelling prescriptions)?;

- persuasive that a functional embedded presence of INFLo, i.e. the 'syntactic referent' of INF TO, is the 'modality operator' that evokes atemporality or tenselessness within the modal complement?

Please email me with any criticisms or references you think relevant. I will summarize back to the list if there is interest.

Variations on this query exist on other listservs and Usenet groups. Please excuse any duplication.

Ken Hughes........Science Education, UBC........hughes@unixg.ubc.ca
2125 Main Mall, University of British Columbia, Vancouver B.C. V6T 1Z5
[Thesis on phenomenological interpretations of language constructions]
Hello everyone

I am not well-versed in Brentano and Husserl but I read their words as containing a plain subtext of '[intentionality [reflection]]' where intentionality is ground to reflexion.

The brackets indicate a quasi-syntactic and hierarchical relationship mapped onto syntactic categories, as if John Venn drew it sideways.

The [I [R]] notion seems uncontroversial and straightforward to me but I haven't found direct quotes to support it.

Husserl (Gibson translation) in Ideas, section 84 provides (weakly):
"this orientation of the Ego in presenting, thinking, valuing I this wakeful intercourse with the correlate object, this directedness towards it (or indeed away from it, though with the glance upon it all the same) is not discoverable in every experience, whereas intentionality may always be concealed in it."

The Oxford Dictionary of the Mind gives commentary in entries on Brentano: (on escaping the dualism of the psychological subject)
"by stressing the fact that the fundamental property of consciousness is intentionality: every subjective experience can only make sense if it is understood as an act of consciousness referred to some object";
Husserl: (the sense of his reduction) "broadens Brentano's theory of intentionality up to a general epistemology ... natural science is 'bracketed' ... but not eliminated because every act of consciousness is intentionally directed towards some object."

Do compelling quotations from Husserl or Brentano arise in your mind?

Do you have objections to the [I [R]] model of the first paragraph? (Please note, the theory elements are thoroughly *representationalist* under mainly Chomskyan and formal semantics object characterizations. The embedded R are formal language acts with projected features.)

If you prefer, email me, no rush. I will summarize back to the list.

Ken Hughes Science Education, UBC hughes@unixg.ubc.ca (formative research relating intentionality and inflection)
Subject: Modality, intentionality, and infinitival TO

I'm finishing up a thesis that examines a phenomenology of verbal inflection and modality. I'm looking at a narrow interpretation of 'syntactic intentionality' that I think is evident in infinitival TO and zero morphs in English and German modal auxiliaries.

When I say intentionality, I mean intentionality in an old-fashioned Husserlian sense as intentionality-as-directedness (not intentionality-as-intensionality) under constrained grammatical views observed in the patterning of infinitival TO (perhaps especially so when it is 'semantically empty'), in periphrastic modal forms, and in related structures such as causatives, verbs of perception, and the tradition. Queries (see P.4gory) infinitival TO belongs to (be it INFLo, some other inflectional head, or some unique category of its own)

I want to assert that its referent seems to be what does the heavy lifting in the generation of sentential modality. This doesn't seem too odd to assert but one consequence of this is that a modal verb (excepting OUGHT) ends up looking something like:

\[ M \rightarrow [ \text{TNS V} [ \text{INFLo?} ]] \] (with two INF nodes?).

This is rather ugly, but it seems clear that something special needs to be said about infinitival TO and modal AUX.

I'm interested in any comments, related mysteries, or refutations. (Note that this grammar uses only a reduced form of Chomsky 1981.) I'll summarize these, along with previous data collection, in April.

Thanks for your attentions,

Ken Hughes  
hughes@unixg.ubc.ca  
Science Education, UBC
Dear Dr. Chomsky

I notice that you have sometimes responded to unsolicited email. I wonder if you wish to comment on the following query.

I am finishing a thesis in Science Education that outlines some of the mechanism of "release" or ekstasis into English verbal modality through the role of infinitival TO or zero inflection. Mostly I worked on doing this project under the rubric of traditional German phenomenology using the contemporary givens of syntactic theory.

(Reprising material you know better than I, but to give you some idea of my orientation, infinitival TO, as a word, has a troubled history with respect to its grammatical category and is a good case of an element that is syncategorematic. Under your recent formulations, inflection is given prominence as one (of the) head(s) of some level of the sentence. Variously it has been categorized as minus TENSE or zero INFL, some special kind of PREP, a verb, as "semantically empty" and "mere mark of the infinitive" in the OED, and so forth.)

I predicated my research on the hypothesis that the release in English modality is achieved by the overt presence, or as a zero morph within a modal verb, of whatever the inflectional referent of infinitival TO is. I gathered both historical and contemporary evidence concerning how modal verbs arrived into Old English and related synchronic phenomena (e.g. an analogy of HAFTA/HASTA with MUST, etc.). As you may have seen, it is possible to arrange much of the spectrum of modality and speech acts by seeing these as grounded in some kind of syntactic directedness (intentionality) which is rooted in infinitival TO.

At one point I wanted to assert that a modal auxiliary verb is (roughly) M --> [ TNS V INFLo ] but such a compound structure is problematic.

Now it appears to me to be more likely to be the case that INF TO only shows up in later S realizations by some kind of insertion process, and thus is a 'word' or 'light verb' like some forms of AUX (DO, BE, etc.). Yet, there is a narrow kind of intentionality which seems central to INF TO's usage and enveloping of its intensional complement.

The OED provides an entry "To err is human, to forgive divine." I wonder if you consider for these nominalized cases that INF TO is a specifier or would it come under some kind of IP/TP node in DP/NP (as would similarly positioned -ING and -EN)?

I'm wondering if you have a spirited intuition or other comments about the view you've decided to adopt?

I am very appreciative of any insights you entertain on this matter. Thank you very much for your attentions.

Ken Hughes hughes@unixg.ubc.ca Science Education, UBC
This appendix schematizes the structure of the OED's entry for infinitival to.

Definition B.III for infinitival TO in [DP] position gives one of a very few explicit assertions for a word being semantically empty. Other findings of semantic emptiness show quite different phenomena.
**TO  Preposition, infinitive/gerund, conjunction, adverb**

### A Preposition

1. Expressing a spatial or local relation. defn. 1-5
2. Expressing a relation in time. 6-7
3. Expressing relation of purpose, destination, result, effect, resulting condition or status. 8-12
4. Expressing a limit in extent, amount or degree. 13-14
5. Indicating addition, attachment, accompaniment, appurtenance, possession. 15-17
6. Expressing relation to a standard or a related term or point. 18-23
7. Expressing relations in which the sense of the direction tends to blend with that of the dative. 24-28
8. Supplying the place of the dative ...

### B Infinitival and gerundial contexts

#### I Infinitive in adverbial relation

- Indicating purpose or intention.
  1a Equivalent to **THAT** or **IN ORDER THAT** with subjunctive
  1b Indicating the purpose or function to which the adjective refers
  1c Expressing the use or function of that which is denoted by the substantive
  2 [no ‘definition’ provided; syntactic context only]
  3 With weakened sense of purpose: indicating an action, etc. with which the principal verb is in some way directed
  4 Usually indicating the application of the adjective
  5 Usually indicating object or application
  6 Indicating destiny or (expected or actual) event or outcome
  7 Expressing result or consequence (potential or actual)
  8 Indicating occasion (passing into ground, reason or cause)
  9 [no ‘definition’ provided; syntactic context only]
  10 expressing a fact or supposition which forms the ground of the statement

#### II Infinitive in adjectival relation

[No remarks]

- Expressing intention or appointment and hence simply futurity (thus equivalent to a future participle)
  11b Expressing duty, obligation or necessity
  11c Expressing possibility or potential action
  12 [no ‘definition’ provided; syntactic context only]

#### III Infinitive in substantival relation

[No remarks]

- Equivalent to a noun or gerund: to being ultimately reduced to a mere ‘sign’ of the infinitive without any meaning of its own.
  13b [no ‘definition’ provided; syntactic context only]
  14 [no ‘definition’ provided; syntactic context only]

#### IV Infinitive equal to a finite verb or clause

[No remarks]

- After verbs of commanding, teaching, desiring, causing, allowing, or the like; equivalent to a that-clause with the noun or pronoun governing a verb in the subjunctive.
  15a
- After verbs of saying, thinking, knowing, perceiving, or the like; equivalent to a that-clause with verb in the indicative. Also after the passive of such verbs, and after intransitive verbs of like meaning, as **SEE, HAPPEN**, etc.
  15b
- With infinitive after a dependent interrogative or relative; equivalent to a clause with **MAY, SHOULD**, etc. (Sometimes with ellipsis of **WHETHER** before or in an alternative dependent question.)
  16

#### V Peculiar constructions

[No remarks] defn. 19-22

### C Conjunction
defn. 1-2

### D Adverb
defn. 1-9
B. to before an infinitive (or gerund: see 22).

History.—Beside the simple infinitive, or verbal substantive in -an (Middle English -en, -e), Old English, like the other West Germanic languages, had a dative form of the same or a closely-related noun, which in Old English ended in -anne, -enne, in Middle English reduced successively to -ene, -en, -e, and was thus at length levelled with the simple infinitive, and with it reduced to the uninflected verb-stem. This dative form was always preceded or ‘governed’ by the preposition tó ‘to’. By many German writers it is called the ‘gerund’, after the Latin verbal noun in -ndum. In modern English the functions of the Latin gerund are more properly discharged by the verbal noun in -ing, and it is therefore more convenient to speak of the Old English form in -anne as the ‘dative infinitive’ or ‘infinitive with to’. Originally, before the dative infinitive had the same meaning and use as before ordinary substantives, i.e. before motion, direction, inclination, purpose, etc., toward the act or condition expressed by the infinitive; as in ‘he came to help (i.e. to the help of) his friends’, ‘he went to stay there’, ‘he prepared to depart (i.e. for departure)’, ‘it tends to melt’, ‘he proceeded to speak’, ‘looking to receive something’.

But in process of time this obvious sense of the preposition became weakened and generalized, so that to became at last the ordinary link expressing any prepositional relation in which an infinitive stands to a preceding verb, adjective, or substantive. Sometimes the relation was so vague as scarcely to differ from that between a transitive verb and its object. This was especially so when the verb was construed both transitively and intransitively. There were several verbs in Old English in this position, such as onginnan to begin, ondnxdan to dread, beb"odan to bid, order, bewerian to forbid, prevent, gellefan to believe, thencean to think, etc.; these are found construed either with the simple (accusative) infinitive, or with tó and the dative infinitive. There was also a special idiomatic use (sense 13 a) of the infinitive with tó as an indirect nominative, where logically the simple infinitive might be expected. From these beginnings, the use of the infinitive with to in place of the simple infinitive, helped by the phonetic decay and loss of the inflexions and the need of some mark to distinguish the infinitive from other parts of the verb and from the cognate noun, increased rapidly during the late Old English and early Middle English period, with the result that in modern English the infinitive with to is the ordinary form, the simple infinitive surviving only in particular connexions, where it is very intimately connected with the preceding verb (see below).

To a certain extent, therefore, i.e. when the infinitive is the subject or direct object, to has lost all its meaning, and becomes a mere ‘sign’ after some verbs of perception, see, hear, feel, and some tenses of know, observe, notice, perceive, etc., in sense 15 b; 4. after had liefer, rather, better, sooner, as lief, as soon, as good, as well, etc.: see have v. 22, rather adverb 9 d, and the other words.) The infinitive with to may be dependent on an adjective, a noun, or a verb, or it may stand independently.

To an adjective it stands in adverbial relation: ready to fight = ready for fighting; to a noun it stands in adjectival or sometimes adverbial relation: a day to remember = a memorable day; to a verb it may stand in an adverbial or substantive relation: to proceed to work = to proceed to working; to like to work = to like working.

B.I With infinitive in adverbial relation. * Indicating purpose or intention. ...

B.II infinitive in adjectival relation [ No remarks, see previous page. ] ...

B.III 13.a, b-14.b With infinitive in substantive relation. Equivalent to a noun or gerund: to being ultimately reduced to a mere ‘sign’ of the infinitive without any meaning of its own. ...

1303 R. Brunne Handl. Synne 6044 Ful wykykke ye that coueuyte ye Wyth other mennes gode falsly to ryse.
1388 Wyclif 1 Sam. xv. 22 To herkene Goddis word is more than to ofrre the ynnere fatnesse of rammes.
14_Chaucer's Pars. T. 670 (Selden & Lansd. MSS.) Auarice is to with_holde & kepe suche thinges as thow hast withouten rightful rede.
1450 tr. De Imitatione ii. viii. 48 To be withoute ihesu is a greuous helle, and to be with ihesu is a swete paradise.
1539 Bi(b)l e(Great) 1 Sam. xv. 22 Behold, to obeye [1388 Wyclif, 1535 Coverd. obedience], is better then sacrifice, & to herken, is better then ye fayt of rammes.
1557 North Gueuara’s Diall Pr. 126 A woman in nothing sheweth her sageness more then to dissemble with a foolish husband.
1601 Shakes. All’s Well i. 148 To speake on the part of virginitie, is to accuse your Mothers.
1667 Milton P.L. i. 157 To be weak is miserable Doing or Suffering.
1709 Pope Ess. Crit. 525 To err is human, to forgive, divine.
1781 Cowper Conversation 8 Talking is not always to converse.
1865 E. Burritt Walk Land’s End 208 The Established Church could not do a better thing than to peoplease these magnificent edifices.
1878 Abney Photogr. (1881) 160 The result is to render such organic matter insoluble. ...
A.5 References


