

THE CODE MODEL OF COMMUNICATION:
A POWERFUL METAPHOR IN
LINGUISTIC METATHEORY

by

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ABSTRACT

THE CODE MODEL OF COMMUNICATION: A POWERFUL METAPHOR IN LINGUISTIC METATHEORY

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The concept of communication is a fundamental notion in the metatheory of linguistics. This study explores the historical development and influence of a particular model of communication, labeled the 'code model'. This model characterizes communication as a process wherein a source (encoder) conveys a message to a receiver (decoder) through the transmission of a signal. Communication is considered successful if the message received is the same as that sent.

This study reviews use of the code model in various linguistic publications, analyzing the code model as a conceptual metaphor and arguing that it structures the way linguists think about communication and language.

While some suggest that the code model predates even Aristotle, this analysis shows that it is better understood as a contemporary *integration* of *three* models which come from disparate sources: (1) the conduit metaphor (a folk model of communication), (2) Saussure's speech circuit (the model of communication expounded in Saussure's

Cours de linguistique générale, and (3) modern information theory (a model and theory of communication from electrical engineering that has provided essential terminology for the code model account of communication). By integrating these three models, linguists have created and maintained several anomalies, which inherently weaken the code model account of communication.

Some have argued that the discipline of linguistics is not united under a single paradigm. This study argues that the discipline is indeed united under a grand tradition, which may be labeled the Saussurean paradigm. While various contemporary traditions within the Saussurean paradigm differ in how they supply details for the model and in their rules for its application, they are nevertheless united in dependence upon code model presuppositions. Recently, however, several traditions have abandoned the model and begun developing alternative views of communication.

As a means of highlighting the power that the code model wields as a conceptual metaphor, an alternative model of communication is suggested and contrasted with the code model. Based upon an artist-and-artifact metaphor, this alternative model is not proposed as an ultimate replacement for the code model, but as an antithesis—an essential element in the evaluation and evolution of linguistic metatheory.

Metaphor plays an important role in virtually all phases of scientific inquiry, and there is perhaps no field where this is more apparent than in linguistics. Of course, the indisputable power of metaphor does not come without certain dangers. In particular, one has no guarantee that a seemingly apt metaphor will actually prove appropriate and helpful when pushed beyond the limited observations that initially inspired it. An investigator who wishes not to be misled must make himself aware of the metaphors he uses and remain alert to both their limitations and the continuous pressure they subtly exert.

George Langacker, *Foundations of Cognitive Grammar*

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CHAPTER I

'COMMUNICATION': A FUNDAMENTAL CONCEPT IN LINGUISTIC METATHEORY

1.1 Introductory comments

Most studies conducted within the field of linguistics are justly described as linguistic studies. They offer analyses or discussion of some element of language. While conducted from within the field of linguistics, this study is not so much a linguistic study as it is a study *of* linguistics. In general terms, it is an examination of how linguists go about their trade. And, importantly, it is an examination conducted by an insider—by a participant—rather than simply a collection of observations made by an outsider. Specifically, the study is a review of the history of a particular idealized model of communication, which has been employed within the discipline for nearly fifty years. It is an examination of how that model developed, spread, and gained influence within the discipline, and how, on some fronts, that influence has begun to wane.

The model in question has been called the code model of communication.¹ It is a basic model of communication and expresses the idea that communication is the transmission and reception of information between a human source (encoder) and receiver (decoder) using a signaling system. David Crystal, in the standard reference work, *A Dictionary of Linguistics and Phonetics*, even employs the model in *defining* communication, noting that “in theory, communication is said to have taken place if the information received is the same as that sent” (1997:72). Edmondson and Burquest (1998:95-96) comment that, as proposed in this view, “language is a kind of code, and communicating is the process of encoding concepts and its inverse decoding. The notion is

quite familiar and so intuitive that the question may be asked whether there is any conceivable alternative to it." This study asserts that the code model concept of communication has been fundamental to the *metatheory* of contemporary linguistics (see Crystal 1997:72).

The notion of metatheory itself bears some discussion, for in some circles, metatheory is taken to signify theory-free or theory-neutral elements in a research tradition. On philosophical grounds this study must reject the assertion that *any* element of a research tradition could be theory-free or theory-neutral. Obviously then, this is not the sense of metatheory employed here. Rather, by metatheory is meant the "underlying beliefs that generate a particular approach." This use of the term metatheory is analogous to "ideology" or "theoretical presupposition" (Figueroa 1994:4).

In exploring similarities and differences between schools of thought within linguistics, this study goes beyond the means of analysis or description employed by various schools. While their differences in method or technique are quickly identified, their similarities often go unstated. Their similarities involve metatheory, and to fail to approach such similarities from a metatheoretical perspective would be neglectful. As Figueroa points out, such a short-sighted study would be at best shallow, for it would not "add much insight to understanding general developments in the field of linguistics" (Figueroa 1994:17). The necessity of a metatheoretical perspective may seem intuitively obvious to some; however, such a perspective has too often been lacking within linguistics.

Perhaps a reason for this neglect lies in the elusive nature of metatheoretical "data." Metatheoretical concepts are embodied in models and theories, and taught via the canonical problems and examples of their respective disciplines. Such concepts are commonly presupposed within the community embracing them and, accordingly, they

typically accompany the model as implicit knowledge. They are rarely discussed in an explicit manner. Nevertheless, they are crucial to the conceptual structure of their respective disciplines. This is the situation for most metatheory, and it is true of concepts of communication within linguistics as well. As Roy Harris has stated:

Every linguistic theory presupposes a theory of communication However minimal or inexplicitly formulated such a theory of communication may be, it has an essential role to play because nothing else can provide the conceptual underpinnings necessary for a more detailed account of how an interactive social activity like language works. (Harris 1987:204)

While the code model is now firmly entrenched within linguistic metatheory, in terms of the history of science and philosophy it is, in fact, a relatively recent innovation. This claim stands in contrast with those of certain other theoreticians, who suggest that the model predates even Aristotle (Sperber and Wilson 1986:2). Indeed, an ancient model is evident there, and to some extent it does continue through the present age. However, rather than regarding the code model as simply the continuation of an ancient idea, it is better for one to understand it as a contemporary *integration* of *three* models: (1) the conduit metaphor (a folk model of communication) (2) Saussure's speech circuit (the model of communication expounded in Saussure's *Cours de linguistique générale*, and (3) modern information theory (a model and theory of communication from electrical engineering that has provided essential terminology for the code model account of communication). Each of these three constituent models and their integration will be addressed in detail in chapter 3. For now, suffice it to say that through the integration of these constituent models, which are the contributions of disparate sources, linguists have created and maintained several paradoxes that continue to haunt the discipline. As will be addressed in chapter 5, these paradoxes fundamentally limit the potential of associated theories and analyses.

Readers should take care to note, however, that use of and dependence upon the code model is not to be attributed to any single school of thought in linguistics. Rather, it is more realistic to see this dependence upon the code model as an expression of the paradigm which dominates contemporary schools of thought. As used here, paradigm refers to a constellation of commitments to particular ways of viewing the method and the subject of inquiry. Such commitments depend upon and extend from metatheoretical conceptual axioms. This notion of paradigm, as has been developed by Thomas Kuhn (1996 [orig. 1962, 2nd ed. 1970]), proves a useful tool in the analysis of the code model and its significance to each of the various schools, as chapter 4 will demonstrate.

Only by recognizing anomalies inherent in the code model may linguists hope to overcome certain weaknesses and inconsistencies that have plagued the discipline since its inception. Some linguists and schools of linguistics have indeed been wrestling with these anomalies, and have been attempting to "redefine linguistics," as Roy Harris has provocatively put it (1990). (Attention will be given to such developments in chapter 4.) Applying Kuhn's paradigm theory to the discipline of linguistics, one may conjecture concerning where metatheoretical shifts may fit within the life cycle of the discipline. Is linguistics experiencing one of Kuhn's revolutions? Of course, this question can be answered confidently only by those who will write our history. Furthermore, if the question of paradigm shift were to be directed toward the discipline as a whole, as if it were a homogenous unit, then that question could easily lead to simplistic answers and violate the distinctive contributions of the constituent schools. As Kuhn (1993:xiii) points out in a later writing, scientific revolutions "should be described not in terms of group experience but in terms of the varied experiences of individual group members."

It should also be made clear that this discussion is not intended to serve as the harbinger of a revolution or "paradigm shift." As Makkai suggests, there have been

enough “paradigm mongerers” in linguistics (1993:2). Individuals do not create paradigm shifts in their colleagues.² If there is any single element of Kuhn’s theory that must not be neglected, it is the proposition that science is a *community* enterprise.

While this study includes a limited review of the history of the discipline where it involves the code model, it is not a goal of this study to write (or rewrite as the case may be) the history of the discipline. Rather, the goal is to identify metatheoretical conceptual axioms commonly held within the discipline and anomalies those axioms support, for in so doing, one might better propose where the discipline may (or should) go.³ In that regard, motives are shared with Andresen, who states as follows her purpose for linguistic historiography:⁴

to lay bare the sometimes unconscious assumptions that linguists bring to their theories of language and to follow the consequences of those assumptions through the elaboration of the theories, often over long periods of time. If we choose, we might also simultaneously reconstruct the philosophical and sociological contexts within which particular periods of linguistic activity take place. This examination of the historical record provides us with a broad perspective on the variety of factors which contribute to the construction of a theory of language. (Andresen 1987:647)

Looking back while looking ahead allows us to evaluate rather than simply react. Newly developing perspectives may not always fulfill the objectives of communities, but they may serve to open new horizons.

1.2 Discussion plan

The study is arranged in six chapters, with this introductory chapter serving as chapter 1. Chapters 2 through 6 are here briefly introduced.

Chapter 2, *Model as Metaphor* addresses the metaphorical quality of models and their role in metatheory. In particular, attention is given to the perspectives on metaphor espoused by the rhetorician Kenneth Burke, linguists George Lakoff and Ronald Langacker, and the philosopher Mark Johnson. The chapter then documents numerous

appeals to the code model that appear in linguistic literature, followed by a brief discussion of the current vitality of the code model.

Chapter 3, *The Code Model Decoded*, discusses the constituent models which have given rise to the code model: the conduit metaphor, Saussure's speech circuit, and information theory. It also addresses their integration within the code model. Finally, it lists common metatheoretical conceptual axioms which depend upon the code model concept.

Chapter 4, *Code Model Linguistics: Patch or Abandon?*, reviews how the code model serves as an exemplar for contemporary practitioners of the Saussurean paradigm of linguistics.⁵ The discussion also reviews basic elements of Kuhn's theory, with attention specifically given to how various linguists have used or rejected Kuhn's theory in accounting for the history of linguistics (Kuhn 1996). The chapter also employs Kuhn's theory in discussing uses of the code model within the "normal phase" of the Saussurean paradigm, including several patches which have been applied to the code model in efforts to overcome anomalies it supports. As representatives of normal linguistics, the study addresses the approaches of generativists, stratificationalists, sociolinguists, functional-typologists, and inferentialists. Finally, the chapter discusses several non-code model approaches to linguistics, which, to the extent that they reject the Saussurean paradigm, may be regarded as "revolutionary." As representatives of revolutionary linguistics, the study addresses the approaches of emergent grammarians, cognitivists, and integrationalists.

Chapter 5, *Developing an Alternative*, offers a critique of the code model, as well as reviews of several other models available in linguistic and related literature. The study then suggests a composite alternative model. The alternative model is not proposed as the singular replacement for the code model, but as an antithesis—an essential element in the

evaluation and evolution of linguistic metatheory. In closing, the chapter discusses the role of emerging metatheoretical perspectives within the life cycle of a discipline

Chapter 6, *Summary and Concluding Comments*, provides a summary of each chapter in turn, together with concluding comments for the study as a whole.

CHAPTER II

MODEL AS METAPHOR

2.1 Metaphor in metatheory

While many linguists may be accustomed to using the code model in a literal manner, that is, regarding its components as if they relate directly to real world processes, the code model is just that, a model. No matter how comfortable one becomes with the use of a model, the model is never more than a metaphor for a real world process. Models are metaphors. Of course, the implications of this assertion require some discussion. In addressing the issue, it is useful to begin with a review of the role metaphor plays in metatheory.

In discussing models as metaphors, an operational definition of the term model proves necessary. In this instance a common definition serves sufficiently well.

Model: "a hypothetical description, often based on an analogy, used in analyzing something" (Neufeldt 1989).

As addressed in this definition, models are often based upon analogy. Richard Lanham concisely defines 'analogy' as "reasoning or arguing from parallel cases" (Lanham 1991:10). Analogy, of course, always involves metaphor. Thus we must move on to define metaphor. Christine Brooke-Rose provides a general definition that serves to summarize the traditional view of metaphor. She suggests that "metaphor ... is any replacement of one word by another, or any identification of one thing, concept or person with any other" (Brooke-Rose 1958:23-24).¹

While the definition offered by Brooke-Rose may resonate with the common view, that metaphor is simply analogy, such a definition may offer little assistance toward

establishing a methodology for an investigating the impact of a particular metaphor. Is the code model simply a convenient metaphor—a “handy” way to reference communication—without having much impact on the actual development of theory? Does the model really impact linguistic theory and practice? Kenneth Burke offers a deeper explanation of metaphor, arguing that metaphor is seldom, if ever, simply a convenient means of expression. Rather, “It is precisely through metaphor that our perspectives, or analogical extensions, are made—a world without metaphor would be a world without purpose” (Burke 1954:194).² Elsewhere Burke comments:

Indeed, as the documents of science pile up, are we not coming to see that whole works of scientific research, even entire *schools*, are hardly more than the patient repetition, in all its ramifications, of a fertile metaphor? ... The attempt to fix argument by analogy as a distinct kind of process, separable from logical argument, seems increasingly futile. (Burke 1954:95-96)

Burke’s appeal to metaphor contrasts with the characterization offered by Brooke-Rose (1959:23-24). Whereas Brooke-Rose describes metaphor as replacement of words and relational identification, a definition which restricts metaphor to the category of literary device, Burke suggests that metaphor is the means by which we shape our perspectives and analogical extensions (Burke 1954:194).

As Burke describes it, metaphor serves in the conceptual framework of the analyst. He writes: “The heuristic value of scientific analogies is quite like the surprise of metaphor. The difference seems to be that the scientific analogy is more patiently pursued, being employed to inform an entire work or movement, where the poet uses his metaphor for a glimpse only” (Burke 1954:96).

George Lakoff and Mark Johnson take the general position Burke offers even a step further, stating: “The essence of metaphor is understanding and experiencing one kind of thing in terms of another” (Lakoff and Johnson 1980:5). At the surface, the definition offered by Lakoff and Johnson may seem similar to that of Brooke-Rose (1958:23-24).

However, the key verbs employed by these theoreticians are quite distinct. Brooke-Rose writes of “replacement” and “identification,” whereas Lakoff and Johnson are concerned with “understanding” and “experiencing.” They write:

Metaphor is for most people a device of the poetic imagination and the rhetorical flourish—a matter of extraordinary rather than ordinary language. Moreover, metaphor is typically viewed as characteristic of language alone, a matter of words rather than thought or action. For this reason, most people think they can get along perfectly well without metaphor. We have found, on the contrary, that metaphor is pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature.

The concepts that govern our thought are not just matters of the intellect. They also govern our everyday functioning, down to the most mundane details. Our concepts structure what we perceive, how we get around in the world, and how we relate to other people. Our conceptual system thus plays a central role in defining our everyday realities. If we are right in suggesting that our conceptual system is largely metaphorical, then the way we think, what we experience, and what we do every day is very much a matter of metaphor. (Lakoff and Johnson 1980:3)

By “poetic imagery” and “rhetorical flourish,” Lakoff and Johnson address the traditional view that metaphor is simply decorative, but that it is not necessary or in any way essential. In contrast, they suggest that metaphor does not simply involve figures of speech, but rather the essential conceptual structuring of thought processes.

While the characterization offered by Brooke-Rose differs greatly from that offered by Burke and by Lakoff and Johnson, a continuum of sorts can be described between the two. All metaphor involves analogical extension. Therefore, with metaphor as an isolated rhetorical figure of speech at one pole and sets of interrelated metaphorical expressions reflecting conceptualization at the other, the position any particular metaphor assumes along that continuum may be described as a function of the extent to which the analogical extension employed reflects (or determines) conceptual organization. The poles may be conveniently characterized as “simple metaphor” and “conceptual metaphor” (see figure 2.1).

| SIMPLE METAPHOR ↔ CONCEPTUAL METAPHOR | |
|---|---|
| <p>Metaphor involves “changing a word from its literal meaning to one not properly applicable, but analogous to it” (Lanham 1991:100).</p> | <p>“If we are right in suggesting that our conceptual system is largely metaphorical, then the way we think, what we experience, and what we do every day is very much a matter of metaphor” (Lakoff and Johnson 1980:3).</p> |
| <ul style="list-style-type: none"> • Figures of speech used to highlight an attribute or characteristic or used for rhetorical effect • Often one-to-one correspondence in replacement of a word by another • Limited scope, so that metaphor may be employed, but the choice of metaphors is not exclusive (e.g., <i>the ground is blanketed with snow; the ground is covered with snow</i>), furthermore, metaphors are not necessarily missed if not employed (e.g., the ground has snow on it) | <ul style="list-style-type: none"> • Used in organizing concepts, so that the concept is often learned through the metaphor or set of metaphors. Accordingly, presuppositions, perception, and behavior may be affected by common employment of the metaphor. • Often expressed through an interrelated <i>set</i> of metaphorical expressions • May be very difficult or seem unnatural to express the concept without appealing to the metaphor (e.g., <i>run out of time</i>) |
| <p>Examples:</p> <p><i>The spring of life</i></p> <p><i>A blanket of snow</i></p> <p><i>The plan unraveled</i></p> <p><i>Get to the heart of the matter</i></p> | <p>Examples:</p> <p>ILLNESS IS ENEMY (e.g., <i>fight off a cold, he's battling cancer</i>)</p> <p>TIME IS MONEY/RESOURCE (e.g., <i>spend time wisely, run out of time</i>)</p> <p>ARGUMENT IS WAR (e.g., <i>I attacked his weak point, he shot down my argument</i>)</p> |

Figure 2.1. A continuum with simple and conceptual metaphors at opposing poles.

In discussing simple metaphors, conceptual metaphors, and the interrelated *sets* of metaphorical expressions related to conceptual metaphors, it is useful to terminologically differentiate the various referents. *Simple metaphors* may be called by that name. Abstract conceptual structures, such as ILLNESS IS ENEMY, may be called *conceptual metaphors*, and particular expressions referring to such structures, such as “*fight off a cold*” and “*he’s battling cancer*” may be called *metaphorisms*, thereby differentiating such expressions from simple metaphors. In this manner of speaking, “fight off a cold” would be identified as an ILLNESS IS ENEMY metaphorism.³

This study asserts that the code model of communication is, for most linguists, more than a simple metaphor. Rather, it is a conceptual metaphor to the extent that it *reflects* conceptual organization of “mature” linguists who employ it and *determines* conceptual structuring for linguists “in training” who learn and adopt it.⁴ Just as our everyday conceptual metaphors, such as ILLNESS IS ENEMY, are tacit and can only be inferred from the actual metaphorisms, so also the code model is tacit and can only be inferred from metaphorisms.

Employing the nomenclature here proposed, one may identify a code-model based expression, such as “ideas to be transmitted are represented by a code” (Denes and Pinson 1993:6 [orig. 1963]), as a COMMUNICATION IS CODING EVENT metaphorism. Depending upon the component of the model in focus, the code model may be said to reflect other metaphors as well, such as COMMUNICATION IS TRANSMISSION EVENT, and COMMUNICATION IS DECODING EVENT.

While such nomenclature has become common in metaphor analysis (see Barlow 1994, Lakoff and Johnson 1980, Reddy 1979), it is not, however, common in model analysis (see Gentner and Stevens 1993). In the more traditional nomenclature of model analysis, a statement such as “ideas to be transmitted are represented by a code,” would

simply be referred to as an *appeal* to the code model. This study will employ *metaphor-analysis nomenclature* when addressing more typical conceptual metaphors, such as the conduit metaphor as an integrated constituent within the code model. In addressing code-model based statements, however, the study will employ the more traditional *model-analysis nomenclature*, by simply describing code-model based statements as “appeals” to the model. An understanding of the code model as a conceptual metaphor nevertheless remains an integral component in this analysis.

Lakoff has introduced a useful concept, that of functional embodiment, that helps explain the significance of conceptual metaphors. A brief introduction to the idea of ‘functional embodiment’ is important here, for it contributes to an understanding of the role of metaphor in metatheory. Lakoff defines the concept as follows:

Functional embodiment: The idea that certain concepts are not merely *understood intellectually*; rather, they are *used* automatically, unconsciously, and without noticeable effort as part of normal functioning. Concepts used in this way have a different, and more important, psychological status than those that are only thought about consciously. (Lakoff 1987:12; italics in original)

To provide a succinct paraphrase, *behavior may reflect the subliminal pressure of metaphor*. This sense of ‘being embodied’ is somewhat distinct from the more traditional sense of the word. In that traditional sense one may speak of a metaphor as the embodiment of underlying presuppositions, whereby a metaphor has provided a form or a conventionalized means of expression for those presuppositions, facilitating their incorporation as a unified whole. Concerning the role of the code model of communication in linguistic metatheory, both senses apply.

2.2 Metaphor in methodology.

Analysts typically consider a model to be useful if several conditions are met. These include, but are not necessarily limited to the following:

- (1) the analysts share (or are induced to share) the perspectives and assumptions the model embodies,
- (2) if, during their own observation, they encounter the same phenomena experienced by other analysts advocating the model, and
- (3) if they are satisfied with how the model elaborates upon their own analyses.

Analysts argue about those assumptions they do not share, those stimuli that they do not jointly experience, and the effectiveness of their respective models in serving their purposes.

These three statements seem reasonable and unproblematic, but they remain incomplete. Investigations into the role of metaphor raise a fourth condition and concern. Is the scientist *ever* capable of experiencing raw stimuli, or may she only experience perception, that is to say, "processed stimuli?"⁵ This question will be addressed more fully in chapter 4, but for now suffice it to say that metaphor may have a constraining effect on the analyst's conception of reality (see Johnson 1987, Kuhn 1996:112, 191-198, Lakoff 1987, Lakoff and Johnson 1980).

One model can be claimed to have more value than does another. The question remains, of course, as to how one will measure such value. The value ascribed is perspective specific, and thereby related to some model, including, perhaps, the one being evaluated. One might propose an alternative to a traditional model, but an audience of traditionalists may overlook any opportunities the new model affords simply because they have been trained to see things through the "lens" of the traditional perspective. In other words, the community may have certain "trained incapacities."⁶ As will be discussed in chapter 4, such an evaluation is not a simple matter. Each community defines its own set of problems, and therefore its own criteria for productivity and for evaluating that productivity (see Kuhn 1996:94).

The question of productivity in models is related to their quality of reduction. Models involve generalizations, and generalizations are necessarily reductive. Lakoff and Johnson point out that metaphorical structuring is always partial, not total. "If it were total, one concept would actually *be* the other, not merely be understood in terms of it" (Lakoff and Johnson 1980:12-13). Indeed, metaphors may even be in conflict with one another, even though they are used to speak of the same phenomenon (Lakoff 1987:305, Lakoff and Johnson 1999). Even a brief study of metaphor illustrates that contrasting metaphors will highlight different aspects of the phenomena to which they are applied. Accordingly, individual metaphors will support different reductive strategies for the problems to which they are applied. This limitation is not necessarily problematic, but it quickly becomes so in the context of reification. Lakoff provides a convenient example:

As Gentner and Gentner (1982) observe, there are two prevalent ways of metaphorically understanding electricity: as a fluid and as a crowd made up of individual electrons. Both conceptualizations are needed. Those who understand electricity only as a fluid tend to make systematic errors in certain kinds of problems—those where the crowd metaphor works better. Students who understand electricity only as a crowd of electrons tend to make mistakes on a different set of problems—those where the fluid metaphor works better. Understanding electricity, at a certain level of sophistication, requires metaphors—more than one. Knowing how to solve problems in electrical circuitry involves knowing which metaphor to use in which situation. (Lakoff 1987:305)

As a function of its reductive quality, Lakoff and Johnson note that metaphor may have a constraining effect on comprehension and experience, and subsequently behavior:

The very systematicity that allows us to comprehend one aspect of a concept in terms of another (e.g., comprehending an aspect of arguing in terms of battle) will necessarily hide other aspects of the concept. In allowing us to focus on one aspect of a concept (e.g., the battling aspects of arguing), a metaphorical concept can keep us from focusing on other aspects of the concept that are inconsistent with that metaphor. For example, in the midst of a heated argument, when we are intent on attacking our opponent's position and defending our own, we may lose sight of the cooperative aspects of arguing. Someone who is arguing with you can be viewed as giving you his time, a valuable commodity, in an effort at mutual understanding. But when we are

preoccupied with the battle aspects, we often lose sight of the cooperative aspects. (Lakoff and Johnson 1980:10)

Building upon the general argument offered by Lakoff and Johnson, Ronald Langacker also comments upon the significance of metaphor in shaping linguists' expectations:

What one finds in language depends in large measure on what one expects to find. Among the factors that shape these expectations is metaphor, whose pervasiveness and formative influence in our mental life have been emphasized in a number of recent studies (Lakoff and Johnson 1980; Lakoff 1987; Turner 1987; Lakoff and Turner 1989). Metaphor plays an important role in virtually all phases of scientific inquiry, and there is perhaps no field where this is more apparent than in linguistics. Of course, the indisputable power of metaphor does not come without certain dangers. In particular, one has no guarantee that a seemingly apt metaphor will actually prove appropriate and helpful when pushed beyond the limited observations that initially inspired it. An investigator who wishes not to be misled must make himself aware of the metaphors he uses and remain alert to both their limitations and the continuous pressure they subtly exert. (Langacker 1991:507)

2.3 Approaching metatheory via metaphor

As cited in chapter 1, Figueroa defines metatheory as "the underlying beliefs which generate a particular approach" and as "ideology or theoretical presupposition" (Figueroa 1994:4). While her definition is useful, the "underlying beliefs," "ideology," and "theoretical presuppositions" which she suggests one might study do not readily present themselves for examination. How then might one approach the study of metatheory?

Most linguists conduct their science without explicitly discussing presuppositions. Nevertheless, the manner in which they speak and write does reflect those presuppositions. Foremost in that reflection are their choices and uses of metaphors. As has been mentioned, Burke (1954), Lakoff (1987), and Lakoff and Johnson (1980, 1999) have argued that metaphors are much more than just a convenient or poetic means of expression.

In developing their theory of language, Lakoff and Johnson discovered that a study of metaphorical expressions in language reveals the more abstract conceptual metaphors that shape behavior and experience. They write:

Our conceptual system is not something we are normally aware of. In most of the little things we do every day, we simply think and act more or less automatically along certain lines. Just what these lines are is by no means obvious. One way to find out is by looking at language. Since communication is based on the same conceptual system that we use in thinking and acting, language is an important source of evidence for what that system is like. (Lakoff and Johnson 1980:3)

Just as a study of metaphorical expressions provides Lakoff and Johnson a means of recognizing underlying conceptual metaphors in language, a study of metaphorical expressions employed by the linguistic community provides a porthole for viewing the more abstract conceptual system to which those metaphors are linked. The metaphors which elaborate the code model of communication provide such a porthole into linguistic metatheory.

2.4 The patient repetition of a fertile metaphor?

As mentioned, Kenneth Burke suggests that “whole works of scientific research, even entire schools,” may be “hardly more than the patient repetition ... of a fertile metaphor” (Burke 1954:95). Has the code model of communication been such a “fertile metaphor” for the discipline of linguistics? Has the discipline demonstrated a “patient repetition” of this particular metaphor?

At a cursory level, even a simple review of the linguistic literature should serve to answer these questions. If the code model has served the discipline in such a way, then the literature should demonstrate that fact. Accordingly, as a means of exploring and discussing that literature, this section documents by way of quotations the development and use of the code model through nearly fifty years of linguistic literature. The quotations

are presented here in chronological order by date of publication, serving to highlight the development and continued use of the model up through the present decade. It is important to note that the quotations do not simply reflect a single school of thought or tradition. Indeed, *most* contemporary linguists have used the code model, regardless of the theories they may employ in accounting for lower level issues. It seems to have mattered little whether they were formalists or functionalists, grammarians or sociolinguists.

It should also be noted that the quotations cited here record that the code model has been the property of mainstream linguistics. Most of the quotations represent the work of prominent theoreticians. In an effort to maintain continuity, discussion of particular theories and theoreticians is kept to a minimum in this chapter. Chapter 4 will address particular theories in more detail.

Because the use of the code model is not the peculiar habit of any particular school of linguistics, the quotations are not grouped by school or subdiscipline. Readers may note that the linguists quoted have not all used the model in the same manner. As will be discussed, it is evident that the code model formalizes a body of shared presuppositions, but theoreticians differ regarding how these presuppositions should be ordered and applied. Similarly, they differ regarding how the components of the code model should be handled. Nevertheless, most have begun with a basic set of presuppositions, demonstrated in the literature via the metatheoretical conceptual axioms they employ (to be discussed in section 3.4). (The discussion now turns to the quotations themselves.)

- CHARLES HOCKETT (1953, 1955)

Charles Hockett was one of the first linguists to take note of Shannon's information theory, writing an influential review of Shannon and Weaver (1949) for *Language* (Hockett 1953). In 1955 Hockett published *A Manual of Phonology*, in which he attempted to incorporate information theory into linguistics (Hockett 1955:7).

Hockett's appeal to information theory is worked throughout the book in development of his "mathematico-mechanical" model of language and communication (Hockett 1955:3).

A few examples are offered here:

The Speech Transmitter converts the discrete flow of phonemes which comes to it into a *continuous speech signal*—a continuous train of sound waves. The code by which the Speech Transmitter performs this transduction is the *phonetic system* of the language. (Hockett 1955:5)

Under normal conditions one constantly monitors one's speech via both [of two] types of feedback. Jill's Speech Receiver is not quiescent as she speaks, but is functioning just as are her Speech Transmitter and her deeper units. Similarly, we may suspect that Jack's Speech Transmitter is not completely quiescent just because at the moment he is broadcasting nothing. As he listens to Jill, his Speech Receiver is able to decode the signal partly because the incoming signal is constantly compared with the articulatory motions which Jack himself would have to make in order to produce an acoustically comparable signal. (Hockett 1955:7)⁷

The phonetic system is the code according to which the Speech Transmitter converts its input (a flow of phonologic units) into sound waves; the same code governs the inverse operation of the Speech Receiver. (Hockett 1955:15)

In Hockett's defense it should be mentioned that he well understood that a mechanical model was being introduced and that the model would have definite limitations. He writes:

Whether or not a mechanical model for a phenomenon constitutes an explanation of the phenomenon depends, not on the model, but on the temperament of the investigator. An explanation is something which satisfies one until one has looked deeper; then one asks for an explanation of the explanation. Certainly those of us with the greatest fondness for mechanical models must avoid the error of argument from analogy. (Hockett 1955:4)

- ROMAN JAKOBSON (1960)

Roman Jakobson, discussing the 'functions' of language (which he termed cognitive, emotive, conative, phatic, metalingual, and poetic), suggests that those functions focused on particular factors within the speech event. He writes:

Language must be investigated in all the variety of its functions. Before discussing the poetic function we must define its place among the other

functions of language. An outline of these functions demands a concise survey of the constitutive factors in any speech event, in any act of verbal communication. The ADDRESSER sends a MESSAGE to the ADDRESSEE. To be operative the message requires a CONTEXT referred to ("referent" in another, somewhat ambiguous, nomenclature), seizable by the addressee, and either verbal or capable of being verbalized; a CODE fully, or at least partially, common to the addresser and addressee (or in other words, to the encoder and decoder of the message); and, finally, a CONTACT, a physical channel and psychological connection between the addresser and the addressee, enabling both of them to enter and stay in communication. All these factors inalienably involved in verbal communication may be schematized as follows: [see figure 2.2] Each of these six factors determines a different function of language. Although we distinguish six basic aspects of language, we could, however, hardly find verbal messages that would fulfill only one function. (Jakobson 1960:353)

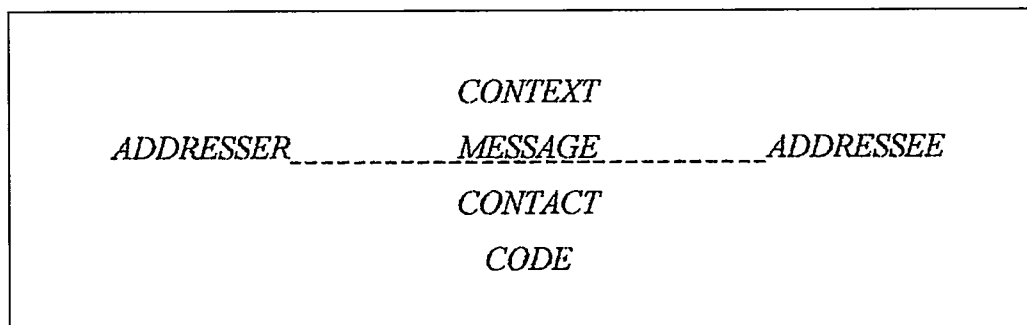


Figure 2.2. Jakobson's communication model (after Jakobson 1960:353).

- PETER DENES AND ELLIOT PINSON (1963)

The model also influenced phoneticians. Here Denes and Pinson employ the model in their text on acoustic phonetics:⁸

We may ... think of the speech chain as a communication system in which ideas to be transmitted are represented by a code that undergoes transformations as speech events proceed from one level to another. We can draw an analogy here between speech and Morse code. In Morse code, certain patterns of dots and dashes stand for different letters of the alphabet; the dots and dashes are a code for the letters. This code can also be transformed from one form to another. For example, a series of dots and dashes on a piece of paper can be converted into an acoustic sequence, like 'beep-bip-bip-beep'. In the same way, the words of our language are a code for concepts and material objects. The word "dog" is the code for a four-legged animal that wags its tail, just as "dash-dash-dash" is Morse code for the letter "O." ...

During speech transmission, the speaker's linguistic code of words and sentences is transformed into physiological and physical codes—in other words, into corresponding sets of muscle movements and air vibrations—being reconverted into linguistic code at the listener's end. This is analogous to translating the written 'dash-dash-dash' of Morse code into the sounds, 'beep-beep-beep'. (Denes and Pinson 1963:6, second ed. 1993:6)

- EUGENE NIDA (1964)

Nida discusses communication in several of his books, occasionally mentioning information theory, or communication theory as it is sometimes called (see Nida 1964:121-122, 1990:85ff).⁹ Nida employs two models of communication. The simpler of the two is composed of only three elements: source, message, and receptor (see Nida 1969:494, 1974:22-23, 1984:2, Nida and Reyburn 1981:5). His more technical writing on the topic, however, supplies additional details, yielding a code-model based account of communication (see figure 2.3).

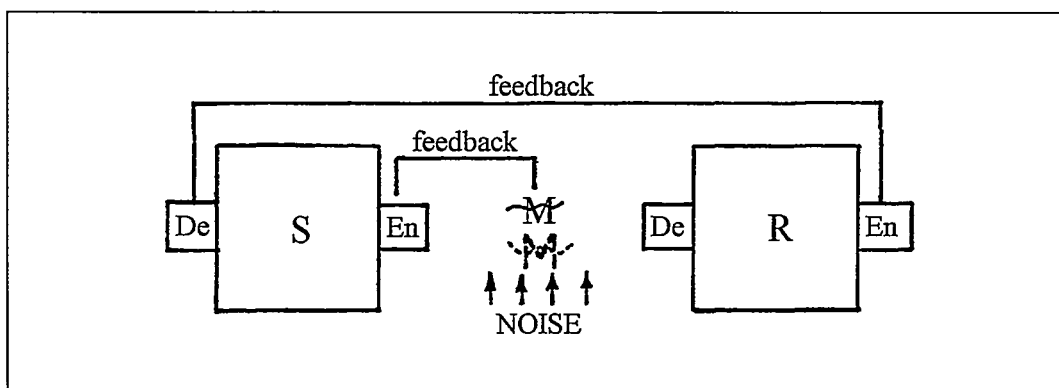


Figure 2.3. Nida's communication model (after Nida 1964:121).

Nida writes:

In Figure [2.3] *S*, *M*, and *R* stand for source, message and receptor, respectively. The wavy line through the *M* suggests the acoustic transmission, while the printed form of *M* stands for a written communication. As appendages to the squares marked *S* and *R* there are sections labeled *De* and *En*, standing for "decoder" and "encoder," respectively ... During the entire process of

communication there is also a factor of “noise,” to borrow a term from communications engineers (Nida 1964:120-121).

Nida and de Waard (1986), expanded the model even further, identifying eight elements and explicitly addressing the issue of intentionality.

For any communication there are eight principle elements: source, message, receptors, setting, code, sense channel, instrument channel, and noise. In this present discussion of communication we are, however, limiting the meaning of communication to events in which a person purposely produces signs which communicate something to receptors. (Nida and de Waard 1986:11)

- JERROLD KATZ (1966)

Natural languages are vehicles for communication in which syntactically structured and acoustically realized objects transmit meaningful messages from one speaker to another. ... The basic question that can be asked about natural languages is: what are the principles for relating acoustic objects to meaningful messages that make a natural language so important and flexible a form of communication.

Roughly, linguistic communication consists in the production of some external, publicly observable, acoustic phenomenon whose phonetic and syntactic structure encodes a speaker's inner, private thoughts or ideas and the decoding of the phonetic and syntactic structure exhibited in such a physical phenomenon by other speakers in the form of an inner, private experience of the same thoughts or ideas. (Katz 1966:98)

[The speaker's] message is encoded in the form of a phonetic representation of an utterance by means of the system of linguistic rules with which the speaker is equipped. This encoding then becomes a signal to the speaker's articulatory organs, and he vocalizes an utterance of the proper phonetic shape. This is, in turn, picked up by the hearer's auditory organs. The speech sounds that stimulate these organs are then converted into a neural signal from which a phonetic representation equivalent to the one into which the speaker encoded his message is obtained. This representation is decoded into a representation of the same message that the speaker originally chose to convey by the hearer's equivalent system of linguistic rules. Hence, because the hearer employs the same system of rules to decode that the speaker employs to encode, an instance of successful linguistic communication occurs. (Katz 1966:103-104)

- NOAM CHOMSKY AND MORRIS HALLE (1968)

The goal of the descriptive study of a language is the construction of a grammar. We may think of a language as a set of sentences, each with an ideal phonetic form and an associated intrinsic semantic interpretation. The grammar of the language is the system of rules that specifies this sound-meaning correspondence.

The speaker produces a signal with a certain intended meaning; the hearer receives a signal and attempts to determine what was said and what was intended. The performance of the speaker or hearer is a complex matter that involves many factors. One fundamental factor involved in the speaker-hearer's performance is his knowledge of the grammar that determines an intrinsic connection of sound and meaning for each sentence. (Chomsky and Halle 1968:3)

- WALLACE CHAFE (1970)

The messages communicated by nonhuman primates are narrowly circumscribed: "The information transmitted to the receiver refers primarily to the current emotional disposition of the signaler. The consequences of effective reception are largely modifications of the emotional dispositions of the receivers." [Bastian 1965:598] ... Inextricably interwoven with that development [of man's evolution and the subsequent broadening of the conceptual universe] has been a vast increase in the number and variety of ideas which man can communicate. The nature of language as a system reflects an evolutionary history of accommodations to this increase. Not only has there been a growth in the number and complexity of ideas which can be communicated, there has also been a change in kind. Through language man communicates not only the emotions and messages essential to his survival, but also an endless array of states, relations, objects, and events both internal and external to himself. (Chafe 1970:24)

- DAVID LOCKWOOD (1972)

In this quotation David Lockwood, a stratificationalist, makes an interesting appeal to code model concepts *without* employing much of the classic information theoretic terminology. Most of Lockwood's account can be traced to the influence of Saussure (see section 3.2.2.2).

Communication through the medium of spoken language is concerned with the conveying of concepts by means of vocal noises. Let us attempt to outline a simple view of what goes on when two individuals communicate using language. One participant in the communication process, let us label him A, goes from concepts inside his brain to muscle movements leading to the articulation of vocal sounds. A second participant, B, receives these vocal noises as they have been transmitted through the air. He perceives them by means of his auditory mechanism, which ultimately leads to a stimulation of his conceptual apparatus. (Lockwood 1972:1)

It should be noted that certain other stratificationalists employ the concept *and* the adopted information theoretic terminology (e.g., Fleming 1990).

- JOHN LYONS (1977)

In his 1977 volume *Semantics*, John Lyons makes the following appeal:

The ideal system is one which encodes just enough redundant information in signals to enable the receiver to recover any information lost as a result of noise. If the conditions of transmission are relatively constant, and if the degree of reliability expected is also relatively constant and does not vary according to the kind of message that is being transmitted, it is possible to design a system which approximates to this idea. It should be clear that the conditions under which linguistic signals are transmitted vary enormously from one occasion to another, and that hearing exactly what is said is more important in some situations than in others. One might not, therefore, expect languages to approximate very closely to the ideal of signalling efficiency. (Lyons 1977:45)

In contrast to many other linguists employing the code model, Lyons is aware of its relationship to information theory. He provides a rather extensive review of information theory in his 1977 volume. He also provides the following, which may be considered a hedge against anticipated criticism:

It is important to realize that the terms in question are of much wider applicability than their origin in communication-engineering might suggest; and they should not be thought of as referring solely to some electrical, mechanical or electronic system of signal-transmission. (Lyons 1977:36)

- BRUCE PEARSON (1977)

Pearson expresses the code model concept in a rather interesting fashion, perhaps foreshadowed in Saussure's *Cours de linguistique générale* (1983:29), where individuals are spoken of as being "linguistically linked.")

Communication implies the transmission of meaningful data from one organism to another. There is no way that two nervous systems can be directly linked to each other, but language provides a means of encoding messages that can be transmitted in such a way that two or more nervous systems can for all practical purposes achieve a linkup. (Pearson 1977:4)

- M. A. K. HALLIDAY (1978)

"'Code' became a buzzword in sociolinguistics in the late 1960s and 1970s following the controversial work of Bernstein (1971, 1973) on the relationship between

educational development and social class” (Wales 1994:577). Bernstein’s two types of code, the ‘elaborated’ and the ‘restricted’, replaced earlier notions of ‘formal’ and ‘public’ language (Bernstein 1971, 1973, 1987). Halliday then developed a theory of social semiotic much influenced by Bernstein, wherein various types of code are posited. The codes are “types of meaning or cultural values, generated by the social system, which are actualized in language varieties and transmitted by different social groups and in different social situations: semiotic styles, in short” (Wales 1994:577). Halliday writes:¹⁰

In the development of the child as a social being, language has the central role. Language is the main channel through which the patterns of living are transmitted to him, through which he learns to act as a member of a ‘society’ ... and to adopt its ‘culture’, its modes of thought and action, its beliefs and its values. ... The striking fact is that it is the most ordinary everyday uses of language ... that serve to transmit, to the child, the essential qualities of society and the nature of social being. (Halliday 1978:9)

In order for language to be a means of learning, it is essential for the child to be able to encode in language, through words and structures, his experience of processes of the external world and of the people and things that participate in them. (Halliday 1978:21)

- ANDREW ELLIS AND GEOFFREY BEATTIE (1986)

The code model has also had a strong role within psycholinguistics. For example, having introduced *The Psychology of Language and Communication* with examples of communicative acts, Andrew Ellis and Geoffrey Beattie write:

What do all these examples have in common that qualifies them to be grouped together as acts involving communication? Can we capture those common features in a working definition of communication? All of these acts clearly involve the transmission of a signal from one organism to another. The signal carries information from a transmitter organism to a receiver organism. Having decoded the signal, the receiver is now in the position to make an appropriate response should one be required.

Drawing all of these threads together we can formulate a working definition of communication which asserts that communication occurs when one organism (the transmitter) encodes information into a signal which passes to another organism (the receiver) which decodes the signal and is capable of responding appropriately. (Ellis and Beattie 1986:3)

- RONALD WARDHAUGH (1986)

It is important to note that the code model is not simply an expression of formal linguistics. For example, its impact has been felt with equal strength in sociolinguistics. Here Ronald Wardhaugh uses the model to express certain underlying presuppositions that are then woven throughout his widely read textbook. The quotation is from the second paragraph of the first chapter.

When two or more people communicate with each other in speech, we can call the system of communication that they employ a code. In most cases that code will be something we may want to call a language. We should also note that two speakers who are bilingual, that is, who have access to two codes, and who for one reason or another shift back and forth between the two languages as they converse, either by code-switching or code-mixing, are actually using a third code, one which draws on those two languages. The system (or the grammar, to use a well-known technical term) is something that each speaker 'knows', but two very important questions for linguists are just what that 'knowledge' is knowledge of and how it may best be characterized. (Wardhaugh 1986:1)

- TALMY GIVÓN (1989)

The code model also appears in functional linguistics, as seen here in a quote from Givon's *Mind, Code, and Context: Essays in Pragmatics*. Givón, having recognized certain limitations in the code concept as employed in formal linguistics, attempts to overcome those limitations by making the code more elaborate.

In the discussion thus far I have deliberately followed a tradition that must now be transcended. That tradition, in discussing language as semeiotics ('coding system'), has been for a long time beclouded by almost total disregard for some rather fundamental facts concerning human language. Chief among those is the fact that language is a *complex, multi-level* code, rather than a relatively simple matching of sound sequences with lexical meanings. (Givón 1989:81)

Givón maintains the general code model concept, but differs from formalists by attributing the origin of the code to iconicity (see Givón 1989:70-125, "The Linguistic Code: The Iconicity of Grammar").

- ILAH FLEMING (1990)

Ilah Fleming, a stratificationalist, provides an elaborated appeal to the model.

In a stratificational view of communication, there are a number of strata, each of which represents a different aspect of the communication system. The stratal levels are, by convention, ordered vertically in diagrams with content at the top and means of expressing the content at the bottom. If the dynamic use of the strata is to encode a message, the communicator starts with the content of his message at the top and encodes it through the relevant strata until it is expressed ultimately by the lower expression level strata with sounds, non-verbal body movements, writing and/or other signals. If an audience wants to decode a message, he starts with input from the expression level and decodes through the relevant strata until he is able to decode the content of the message. The success of the communication is affected by the degree to which the inferred message of the decoder matches the intended message of the encoder. (Fleming 1990:25; preliminary edition, quoted with permission)¹¹

It is noteworthy that Fleming includes the information theoretic terminology that Lockwood (1972) had avoided.

- DAVID CRYSTAL (1997)

Crystal's longstanding work, *A Dictionary of Linguistics and Phonetics*, provides a classic version of the model in his definition of communication.

Communication A fundamental notion in the study of behavior, which acts as a frame of reference for linguistic and phonetic studies. Communication refers to the transmission of information (a 'message') between a source and receiver using a signalling system: in linguistic contexts, source and receiver are interpreted in human terms, the system involved is a language, and the notion of response to (or acknowledgement of) the message becomes of crucial importance. In theory, communication is said to have taken place if the information received is the same as that sent. (Crystal 1997:72)

While Crystal's definition of communication makes a firm appeal to the code model, he does not seem cognizant of the extent to which the model has impacted the discipline. In another entry defining 'information', he does refer to information theory; however, he seems to suggest that the impact of that theory is somewhat limited, particularly to the Hallidayan school (Crystal 1997:196). Similarly, in defining 'code', he almost denies its influence, writing:

Code The general sense of this term—a set of conventions for converting one signalling system into another—enters into the subject-matter of semiotics and communication theory rather than linguistics. Such notions as ‘encoding’ and ‘decoding’ are sometimes encountered in phonetics and linguistics, but the view of language as a ‘code’ is not one which figures greatly in these subjects. The term has come to the fore in sociolinguistics, where it is mainly used as a neutral label for any system of communication involving language—and which avoids sociolinguists having to commit themselves to such terms as dialect, language or variety, which have a special status in their theories. (Crystal 1997:66)

K. Wales (1994) agrees with Crystal in part, suggesting that the term ‘code’ is being used in place of ‘language’, ‘variety’, and ‘dialect’, but in contrast to Crystal, Wales correctly notes that this use of the term ‘code’ extends far beyond the domain of sociolinguistics. Wales writes:

‘Code,’ as a term borrowed from communication theory and semiotics, is so widely used in other fields, linguistic and literary, that it is in danger of becoming a mere synonym for language, variety, or dialect. Yet to a large extent the technical origins of the word still remain, in that it sounds jargonistic and also conveys the connotations of systemization. (Wales 1994:577)

- THE CURRENT GENERATION

The quotations provided above document the existence of the code model from its early years through the recent past. These successive appeals span nearly fifty years. The goal here has not been to produce an exhaustive list, but rather, a sample. The literature includes scores of other appeals to the model which could have been similarly quoted.

Having considered the brief description of the code model provided in the introduction and the record of its use as provided through the quotations, some readers may readily identify in that model an historical event, but question the extent to which that model continues to influence the present generation. It is certainly a legitimate question. Just because a model was fashionable for a time does not necessarily mean that its influence has been either pervasive or lasting.

As a means of answering this question about contemporary influence, in the early stages of this study, a brief pilot survey was circulated among students who were at the time studying linguistics, as well as among a number of professors and instructors. The survey consisted of one open-ended question: "How would you define or describe the process of communication?" This was followed by a few questions concerning demographics. Of those who returned survey forms, a full 50% supplied a code model-based answer in their definition of communication. A full 75% made an appeal to one or a combination of the constituent models integrated in the code model. Of this segment, 67% percent employed the code model.¹² No respondents assigned the model a name; rather, they seemed to be describing communication "as it is." Of those using the code model, only one respondent cited a reference.¹³ One other respondent, a student employing the conduit metaphor, acknowledged that he was using a metaphor in his definition of communication, though he did not refer to it by any name.

Several responses included diagrams, such as occurs in the response presented in figure 7.1 (see the appendix). Figure 7.1 records a response from a graduate student studying linguistics. The text states:

Concept or idea is encoded, transmitted in some form, either oral or written or other symbolic means (gestures, pictures, etc.), then decoded, by a recipient so that he also now has an idea.

The accuracy of communication is determined by the degree to which the recipient ends up with the same concept or idea that the original sender attempted to send. (Questionnaire response. April 7, 1998.)

A similar response was offered by a colleague with an M.A. in linguistics (see figure 7.2 in the appendix):

Communication is the process by which information is transmitted from a source (usually a person) to a receptor (usually another person, or group of people). It requires, therefore, that the source and the receptor share some knowledge about the code being used to transmit the information, whether that code is verbal, visual, or otherwise. (Questionnaire response. March 28, 1998.)

These two responses are in many respects typical of the code-model based responses provided.

After the survey and initial research for the study had been completed, those portions were presented as a paper at an academic conference (Blackburn 1998). Specifically, the presentation covered the history of the code model and its permeation through linguistics. Following the session, a fellow presenter commented, "I taught this [model] to my students just last week, but you know, before today, I'd never given any thought to the model or where it came from."

A third and perhaps even more illuminating type of response has often arisen in the context of personal conversation concerning the study. When colleagues have been asked, "How do you think communication works?" a majority have responded with a code model-based answer. But if, instead of eliciting their description of communication, they were given a synopsis of the study, many responded with debate. The standard response went something like, "Oh, that's how we *talk* about communication, but I don't think it really has much bearing on how we do linguistics."

These responses are interesting, but they should not be surprising. The code model of communication serves to embody *presuppositions*, and those presuppositions can indeed guide the analyses of the linguists holding them. Considering the significance of the role thus served, one might expect that the model would be well documented and thoroughly "digested" in discussion. It's structure has been observed and addressed by a few theoreticians (Berge 1994, Harris 1981:10-13, Harris 1987:205-208, Harris 1990, Schiffrin 1994:391-393, Sperber and Wilson 1986:2-6ff), but more frequently it is employed in a naive manner, rarely being explicitly identified or discussed. Instead, it is assumed *a priori*, being adopted and incorporated as tacit knowledge. Indeed, some

linguists report that they cannot conceive of communication operating in any other way than that spelled out in the model.

2.5 Reified metaphor

In conclusion, consider the following admonition from Eugene Nida's Presidential Address to the Annual Meeting of the Linguistic Society of America in December 1968, wherein he warns against the tendency to employ models without a keen awareness of the metaphors upon which they depend:

Perhaps part of the difficulty in linguistics, as in all branches of science, is not having fully recognized certain inadequacies in our models. Turbayne 1962 has clearly pointed out the metaphorical nature of so-called scientific models. They are essential aids to comprehension, but they must not be permitted to dictate the nature of what they are supposed to explicate. It is particularly dangerous to employ mechanical models as ways of describing the nature of language and the presumed manner in which the human brain functions in encoding or decoding messages. Elaborate networks with and-or nodes are fascinating devices for suggesting certain logical relationships, but they should certainly not be regarded as having any direct bearing on the way in which the brain actually functions in encoding or decoding. (Nida 1969:488)

It is no insignificant matter that *even in the midst* of this warning against the subliminal influence of metaphor in models, Nida has employed the code model itself. One would be hard pressed to find a more cogent example of the pervasiveness of the code model and the unconscious manner in which it has sometimes been employed. The irony of having in a single statement both use of the code model and a warning concerning the influence of such models certainly highlights the influence the code model has had as a conceptual metaphor.

As mentioned, a primary objective of *any* modeling effort is to capture certain generalizations. In theory at least, it is understood that models can never account for all details and that exceptions exist. In other words, "All models leak." Most theoreticians would readily support this well-established axiom. Nevertheless, in practice it is common

for models to take on a life of their own. Models can only capture generalizations. As such, only those concerns which the analyst considers salient are given prominence and generalized. But models also guide analysis. In time the guiding function of a model, coupled with the favored generalizations which gave it birth, may serve to create an interdependency such that the model conceptually supplants the very phenomena it was used to describe. When this occurs, it reflects a type of reification—the abstraction is being treated as if it were a concrete object. David Sternberg illuminates the general phenomenon of reification:

People have, apparently, a universal tendency toward reification—assigning too much power to abstractions Reification is characterized by amnesia about who created social products. Forgetting that we frail imperfect humans forged them in the first place leads to a ... misconception that such products are timeless, immutable, and demanding in perfection (Sternberg 1981:169)¹⁴

Warren Shibles offers similar comments:

Each philosophy, school of science, etc. is based upon a number of basic metaphors which are then expanded into various universes of discourse. By seemingly incongruous juxtapositions new knowledge is attained and revealing hypotheses suggested. A knowledge of metaphor allows us to see what it is possible to say and how to say it. It also helps us avoid being captivated by our metaphors which we unconsciously thought were literal truths. Perhaps the joke played most often on the thinkers of the past is that of their having taken their theories and ideas as literal truths. This is as true of scientists as of others. (Shibles 1971:3)

CHAPTER III

THE CODE MODEL DECODED

3.1 The code model as a concept

The discipline of linguistics has not always ascribed to the code model. The model did not appear on the linguistic scene until the mid-1950s, following the appropriation of Shannon's information theory (Shannon 1948, Shannon and Weaver 1949, Weaver 1949a). An adjusted version of information theory was then integrated with an already existent model, an integration of the ancient conduit metaphor (Reddy 1979) and Saussure's speech circuit (Saussure 1916, 1983). This chapter addresses each of these three constituent models in turn, as well as addressing their contemporary integration in the code model.

While this study addresses the impact of a single model of communication, it would be at best naïve to regard that model as the only model available. Indeed, as K. L. Berge (1994) points out, communication-relevant literature demonstrates the existence of several models. This is evident even though the adherents to various models do not always directly or explicitly refer to those models. As stated previously, theoretical dependence upon a particular model may, in many cases, be most evident in the choice of metaphors employed by the respective theoreticians, rather than in explicit statements offered by those theoreticians. As Berge states it: "The trends [in communication-relevant research] can be classified according to the basic models of communication they have adopted. Or rather, according to the different metaphors that linguists use in order to try to illustrate or make explicit the phenomenon of communication" (Berge 1994:614).

The present study differs from that offered by Berge, but it does follow a similar pattern in emphasizing the role of metaphors for communication. It is useful to note Berge's use of the term "adopted." The term suggests two premises, both of which are instrumental in an historical review of the code model, its development, and influence:

- (1) There is more than one way to view communication.
- (2) The use of a model correlates with presuppositions held by linguists using the model.

Coupled with a truism offered by the diffusionist Torsten Hägerstrand, these two premises support a third. Hägerstrand writes, "It is self-evident that nobody can adopt an innovation without first having gained knowledge about its existence" (Hägerstrand 1965).¹ In other words, if linguists employ the same jargon and similar models, it is quite likely that these linguists did not develop these terms and models in isolation. The third premise may then be stated:

- (3) Linguists work in community; they share presuppositions and models.

Why are these premises important? Namely because of the reification that has taken place regarding the code model, so that for most linguists the model has become *the* way to view communication, rather than simply *a* way. There is a risk that linguists fail to identify the code model as simply a metaphorical tool, as a model. Thinking of it as a literal account of reality almost precludes a realization that communication has not always been described in such terms. Dan Sperber and Deirdre Wilson comment, "The view of linguistic communication as achieved by encoding thoughts in sounds is so entrenched in Western culture that it has become hard to see it as a hypothesis rather than a fact" (1986:6). If indeed communication has not always been described in such terms, then it is likely that those employing the terms share, in some sense, a relationship or network whereby they came to employ the term. This will prove important in subsequent

discussion, but for now, the point is relatively simple: being a conceptual metaphor, the code model is an assemblage of concepts, and as such, it had a beginning.

In his 1951 volume titled *The Art of Clear Thinking*, Rudolf Flesch discusses the importance of remembering that every concept had a beginning. In his opinion, remembering this little fact helps to keep one from falling victim to the belief that “concepts are things.” Flesch recounts the origins of several concepts, such as national sovereignty, the chair as a household implement, and zero—concepts which are now so common that, like the code model, they are rarely under consideration. Having listed their dates of origin, he writes: “I think that if you keep this little table [of innovations and dates] in mind, it will be difficult for you ever to fall into the error that concepts are things. They are not; they are vague references to certain qualities a number of unspecified things have in common” (Flesch 1951:34).²

With the three premises established and Flesch’s illustration as a backdrop, the chapter now turns to an account of the origins of the code model. The chapter also addresses each of the constituent models in detail, as well as discussing their integration and implications which have arise from that integration.

3.2 Origins of the code model: the integration of three constituent models

So where exactly did the code model “come from” and when did it first appear? It seems that the label “code model” first appeared in Sperber and Wilson (1986:2). Earlier accounts sometimes refer to the basic model as the “communication triangle” (e.g., Kinneavy 1971:17-40). The model itself, however, predates any of its names. As was mentioned previously, the model has been developed through the integration of three models. The later of these three models was published in 1948 and the integration of the three began to appear shortly afterward. In evaluating the significance and life of the code

model within linguistics, an investigation of its constituent models proves crucial. These three models are:

- (1) the conduit metaphor, an ancient folk model of communication which finds its place in language about language.
- (2) The speech circuit model, developed in the teachings of Ferdinand de Saussure and provided through sections of *Cours de linguistique générale* and first published in 1916.
- (3) information theory and its associated model of communication, developed in the context of electrical engineering and telecommunications in the late 1940s.

To some extent, each of these models has had an independent existence, with the quality of their union being distinct from the quality of their independent status.

Of the three models integrated in the code model, the conduit metaphor is by far the most pervasive, being a commonly expressed folk model found in many cultures, including those speaking varieties of English. While fewer people have been exposed to Saussure's speech circuit, it is related to a common philosophical position, having been developed in part from the earlier work of the British philosopher John Locke. Information theory is much less widely employed, but it has had a considerable effect within the fields of electrical and computational engineering, and the social and behavioral sciences, as well. As a result, many students have been exposed to the information theoretic components of the code model prior to their exposure to it via linguistics. The fact that these constituent models have an existence and independence outside of linguistics lends intra-linguistic appeals to the code model a certain *a priori* plausibility. A portion of this apparent plausibility extends from the frequency of exposure itself, rather than deriving from the arguments associated with constituent models.

Because they have been integrated into a unified model, it may appear that the three constituent models have similar components and are complementary. In the case of the conduit metaphor and Saussure's speech circuit, this may be true to an extent. However, in the case of Shannon's information theory, the components are actually quite dissimilar to and non-complementary with those of the other two models. Because of the way the models have been changed and manipulated in the integrative process, many linguists do not fully recognize the models as distinct, each with its own logical requirements.

All models of communication will involve at least three components. The history of three component models is ancient, being evident even in the teaching of Aristotle, who in teaching on rhetoric described communication in relation to the components of speaker, speech, and audience. Nida's simplified model of communication similarly employs three components: source, message, and receptor (see Nida 1969:494, 1974:22-23, 1984:2, Nida and Reyburn 1981:5).³ In a generic model of communication, the first and third of the components are simply 'units' capable of participating in communication. The second component is that 'thing' which may happen or pass between them (see figure 3.1). The simple fact that certain communication models each have three components does not in and of itself support the assumption that those respective components are analogous.

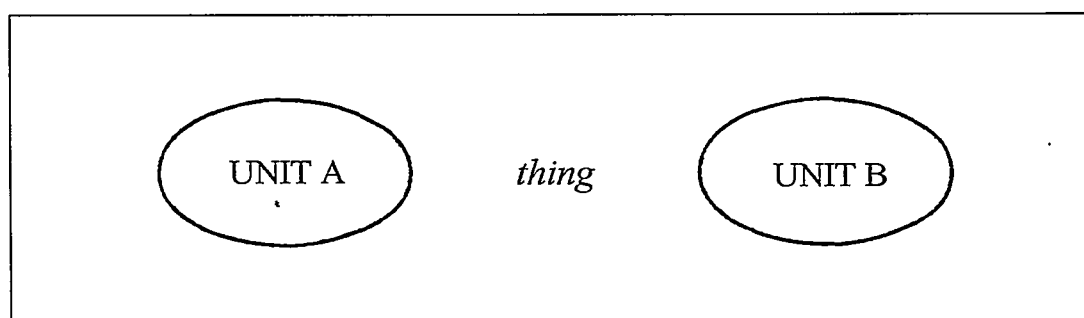


Figure 3.1. A generic model of communication.

The amorphous terms 'unit' and 'thing' are employed in this generic model, for it is difficult, if not impossible to provide more specific labels without evoking particular theories. Even such vague and seemingly innocuous terms may suggest a particular theoretical predilection. Note, however, that the generic model presented in figure 3.1 is *not* the code model. Nor is the code model simply a version of this generic model. Readers accustomed to thinking in code-model terms may interpret this generic figure in code model terms, but that interpretation will extend from their prior experience, rather than from the representation itself. The point here is that the distinctive qualities of various models arise through the definition of roles, sub-components, and processes involved. It is not difficult to overlay various models so that the three major components generally match up, but in so doing, one may be ignoring the constraints of the respective models in the process. This is basically what has happened in the development of the code model. Somewhat inadvertently, the three constituent models have been overlaid and components mixed and matched in the process. The three models involved are rather exclusive, but they have been overlaid regardless. In the process, the discipline of linguistics has created for itself a set of anomalies and problems for which the code model is entirely incapable of accounting. (These will be discussed in chapter 5.)

The temporal adoption sequence for the constituent models is an important component in this analysis of the model, for without a careful evaluation of the constituent models and their logical and temporal relationship to one another, it is all too easy to regard the three constituents simply as siblings or even reincarnations of one another. While several theoreticians have addressed the code model in a limited manner, the relationship between the constituent models has received limited attention. In the process, the relationships have been inadequately represented.

For example, Sperber and Wilson introduce the model with the following anachronistic suggestion: "From Aristotle through to modern semiotics, all theories of communication were based on a single model, which we will call the *code model*. According to the code model, communication is achieved by encoding and decoding messages" (1986:2). They continue, briefly addressing Shannon and Weaver (1949) and introducing extensions of the information theoretic model to human verbal communication (1986:4-5). That two-page sequence is immediately followed by an inadequate assertion that the diagram from Shannon and Weaver (1949) was an adaptation of the ancient surrogationalist model as defined by Aristotle and expounded by Arnauld and Lancelot:

While Shannon and Weaver's diagram is inspired by telecommunications technology, the basic idea is quite old, and was originally proposed as an account of verbal communication. To give just two examples: Aristotle claimed that 'spoken sounds are symbols of affections in the soul', which are themselves 'likenesses of actual things' (Aristotle, *De Interpretatione*: 43). In our terms, he claimed that utterances encode assumptions. Arnauld and Lancelot in their famous *Grammaire de Port-Royal* describe language [in this way:] ... 'Words ... may be defined, distinct and articulate sounds, made use of by men as signs, to express their thoughts' (Arnauld and Lancelot, *Grammaire de Port-Royal*: 22). (Sperber and Wilson 1986:5-6)

An ancient theory of signs does indeed occur in the writings of Aristotle. In fact, the rudiments of such a theory appear even in the teachings of Socrates as recounted by Plato (*Cratylus*, *Republic*; see Cornford 1935, Harris and Taylor 1997:19). But Sperber and Wilson are mistaken in their suggestion that the diagram from Shannon and Weaver (and by extension, the theory) was simply "inspired" by telecommunications technology and that underlying that theory is the ancient theory of signs. Rather, the information theoretic model as presented first in Shannon (1948) is "a schematic diagram of a general communication system" representing electronic devices and intended for use in electrical engineering. While Shannon's model does bear similarity in form to semiotic models, including Saussure's speech circuit, in its original context it is unrelated to the ancient

theory of signs to which Sperber and Wilson refer. As will be discussed, the model was inaccurately cast in human terms by Weaver, as appears in Weaver (1949a, 1949b). The fact that some linguists employ the code model in *discussing* semiotics (e.g., Lyons 1977) should not be mistaken for evidence that the information theory from which the code model terminology is derived is itself concerned with semiotics. In describing the code model as predating Aristotle, Sperber and Wilson too easily overlook the constituent models and their distinctive qualities integrated in the code model.

Deborah Schiffrin simply follows and cites Sperber and Wilson, stating: "The code model of communication is 'entrenched in Western culture' (Sperber and Wilson 1986:6): it is said to trace back to Aristotle and it underlies many contemporary linguistic theories" (Schiffrin 1994:391).

Roy Harris notes the "code metaphor," but gives little attention to the origins of this metaphor or how it has been worked into linguistics and integrated with earlier models:

In some modern versions [of the translation model of communication], the metaphor of translation is replaced by that of 'encoding' and 'decoding'....

The code metaphor is not merely 'terminological'. ...

It is evident that the substitution of the code metaphor for the translation metaphor alters nothing in the account of communication, except perhaps to make even more perspicuous the point that the objective is the recovery by B of exactly the same conceptual package (the 'message') as A originally formulated. (Harris 1987:205-206)

In his powerful article on communication and linguistic theory, K. L. Berge mentions Reddy's conduit metaphor, properly attributing to it the status of communication model. He correctly notes that some uses of the conduit metaphor are related to certain uses of information theory. Unfortunately, however, he does not isolate the conduit metaphor and information theory as having independent status. In fact, he does just the opposite, suggesting that the conduit metaphor has roots in information theory:

The simplest model of communication has been called the conduit model (Reddy 1979) because of its underlying assumption that language functions as a sort of channel, or tool for transferring a linguistic message from a source (or sender) to a destination (or hearer). This idea of communication has some of its roots in information theory. (Berge 1994:614)

Here Berge is undoubtedly referring to the code model; otherwise his comment would clearly be anachronistic. Information theory did not appear on the scene until 1948. The conduit metaphor, however, predates that theory by hundreds, if not thousands of years.

In interpreting old models from a contemporary perspective, rather than from an historical perspective, contemporary views are easily imposed upon the older models. In examining each constituent independently, in detail, and with an eye toward historical context, the respective qualities of the constituents are more readily identified. Furthermore, the weaknesses inherent in the integration of the three models become increasingly evident.

The discussion now turns to a detailed analysis of the code model and its constituents. The immediately following sections (3.2.1 through 3.2.3) explore each of the three constituent models in turn. In an effort to keep the discussion concise and free of entanglement, the three will be addressed independently. This is followed by a discussion of the integration to which they have been subjected (section 3.3).

3.2.1 The conduit metaphor

The role of metaphors in linguistic metatheory has until the last few decades been generally overlooked or ignored. The instrumental analysis offered by Michael J. Reddy (1979) has undoubtedly been the catalyst for what literature there is available. Reddy's paper, *The Conduit Metaphor—A Case of Frame Conflict in Our Language About Language*, serves as a landmark for those interested in the subtle pressure of metaphor. Reddy investigates the *conduit metaphor*, the preeminent metaphor employed by English speakers in referencing and thinking about the process of communication. The origins of

the metaphor are unknown, but it is suspected that the metaphor has been employed for hundreds, if not thousands of years. The conduit metaphor suggests that meaning (i.e., thoughts, ideas) can be sent, as via a conduit, from speaker to hearer. (Reddy offers many excellent examples, including, "It's hard to *get* that idea *across* to him.")

The conduit metaphor commonly involves a second metaphor, the container metaphor, which suggests that meaning can be contained in words (and language generally). Words can then serve as a package to be sent along the conduit. The hearer then "unpackages" the meaning on the other end. (Again, Reddy offers examples, including, "The introduction *has* a great deal of thought *content*" (1979).)

As will be discussed, the conduit metaphor plays a tremendous role in the code model of communication. Most sciences have a metalanguage that serves as an investigative tool. Accordingly, the existence of that metalanguage is rather independent of the subject of inquiry. This is not so for linguistics, for as Uriel Weinreich observes, "Language is its own metalanguage" (Reddy 1979:286). Building upon Weinreich's observation, Reddy investigates the way in which speakers of English refer to their own communicative efforts and the efforts of others (Reddy 1979:286). In doing so, he powerfully illustrates the workings of the container and conduit metaphors.

If an accurate understanding of this metaphor is to be developed, that understanding must include awareness that the conduit metaphor is *universally employed* by speakers of English. It is such a common means of expression and is so deeply embedded in speakers' thought processes, that most speakers are unaware that a metaphor is even involved. This lends it an intuitive plausibility that is difficult to overcome.

Reddy characterizes the conduit metaphor as having a "major framework," which also includes a container metaphor, and a "minor framework," which does not evoke the container metaphor. Of the major framework he writes:

The core expressions in these categories imply, respectively, that: (1) language functions like a conduit, transferring thoughts bodily from one person to another; (2) in writing and speaking, people insert their thoughts or feelings in the words; (3) words accomplish the transfer by containing the thoughts or feelings and conveying them to others; and (4) in listening or reading, people extract the thoughts and feelings once again from the words. (Reddy 1979:290)

The logical implausibility of words acting as containers (i.e., as “having insides”) contributes to the use of the minor framework, which avoids that collocational clash.

Reddy writes:

Beyond these four classes of expressions [in the major framework], there are a good many examples which have different, though clearly related, implications. The fact that it is quite foreign to common sense to think of words as having “insides” makes it quite easy for us to abstract from the strict, “major” version of the metaphor, in which thoughts and emotions are always contained in something. That is, the major framework sees ideas as existing either within human heads or, at least, within words uttered by humans. [In contrast,] The “minor” framework overlooks words as containers and allows ideas and feelings to flow, unfettered and completely disembodied, into a kind of ambient space between human heads. In this case, the conduit of language becomes, not sealed pipelines from person to person, but rather individual pipes which allow mental content to escape into, or enter from, this ambient space. Again, it seems that this extension of the metaphor is aided by the fact that, somewhere, we are peripherally aware that words do not really have insides.

In any case, whatever the cause of the extension, there are three categories of expressions in the minor framework. The categories imply, respectively, that: (1) thoughts and feelings are ejected by speaking or writing into an external “idea space”; (2) thoughts and feelings are reified in this external space, so that they exist independently of any need for living beings to think and feel them; (3) these reified thoughts and feelings may, or may not, find their way back into the heads of living humans. (Reddy 1979:290-291)

Reddy documents the existence of more than a hundred types of conduit-metaphor expressions in English, which he estimates account for at least 70 percent of the expressions used for talking about language. Lakoff and Johnson (1980:10-11) facilitate discussion of the issue by selecting certain particularly cogent examples from Reddy’s larger corpus:

It’s hard to *get* that idea *across* to him.
I *gave* you that idea.
Your reasons *came through* to us.
It’s difficult to *put* my ideas *into* words.
When you *have* a good idea, try to *capture* it immediately *in* words.

Try to *pack* more thought *into* fewer words.
 You can't simply *stuff* ideas *into* a sentence any old way.
 The meaning is right there *in* the words.
 Don't *force* your meaning *into* the wrong words.
 His words *carry* little meaning.
 The introduction *has* a great deal of thought *content*.
 Your words seem *hollow*.
 The sentence is *without* meaning.
 The idea is *buried in* terribly dense paragraphs.
 (Lakoff and Johnson 1980:10-11; selected from Reddy 1979).

Lakoff and Johnson also discuss the conduit metaphor. Employing their own notation for referencing metaphors, Lakoff and Johnson concisely summarize the component metaphors Reddy addresses as follows (1980:10):

1. IDEAS (OR MEANINGS) ARE OBJECTS.
2. LINGUISTIC EXPRESSIONS ARE CONTAINERS.
3. COMMUNICATION IS SENDING.

Noting the intuitive satisfaction these metaphors and their related expressions endue, Lakoff and Johnson comment:

In examples like these [selected from Reddy 1979] it is far more difficult to see that there is anything hidden by the metaphor or even to see that there is a metaphor here at all. This is so much the conventional way of thinking about language that it is sometimes hard to imagine that it might not fit reality. But if we look at what the CONDUIT metaphor entails, we can see some of the ways in which it masks aspects of the communicative process.

First, the LINGUISTIC EXPRESSIONS ARE CONTAINERS FOR MEANING aspect of the CONDUIT metaphor entails that words and sentences have meaning in themselves, independent of any context or speaker. The MEANINGS ARE OBJECTS part of the metaphor, for examples, entails that meanings have an existence independent of people and contexts. The part of the metaphor that says LINGUISTIC EXPRESSIONS ARE CONTAINERS FOR MEANING entails that words (and sentences) have meanings, again independent of contexts and speakers. (Lakoff and Johnson 1980:11-12)

For native speakers of English, at least, there should be no cause for debate regarding the pervasive nature of this metaphor. In the common vernacular the metaphor is unequivocally the dominant means of expression regarding communication.

3.2.1.1 Diffusion of the conduit metaphor in linguistic thought and literature

Is the conduit metaphor an active conceptual metaphor in linguistic theorizing? Obviously it is still active in common language, and there is no reason to think it will (nor should) become otherwise; however, its use in linguistic metalanguage and metatheory is another issue entirely. For example, consider common metaphors used by natural scientists. The metaphors “sun rise” and “sun set” are good examples. English speaking astronomers most surely use these metaphors in everyday speech. But what sort of astronomy would have developed if they persisted, even unwittingly, in using these metaphors in constructing their theories? Needless to say, there would be certain paradoxes that theories so formed would *never* be able to handle. And this was exactly the situation before Copernicus (and subsequently Galileo) identified anomalies and proposed a new metaphor (i.e., model) for the solar system.

For some familiar with Reddy’s argument, the conduit metaphor is readily recognized and its use considered passé. For example, Gary Palmer writes:

The conduit metaphor, by now something of a straw man, construes linguistic meaning as consisting of discrete, stable objects contained in words and sent from speaker to hearer. But the model is surely wrong, because, as Langacker (1987:162) pointed out, “nothing travels from speaker to hearer except sound waves” (Palmer 1996:39; also see Langacker 1991:508).

While Palmer may be well acquainted with arguments concerning the metaphor, it is difficult to evaluate just how broadly such awareness extends through the linguistic community. As Palmer concedes, the model is still found in textbooks of communication (1996:162). Incorporated within the code model, it is also still found in textbooks of linguistics and in linguistic instruction (see again section 2.4). And, as Reddy suggests, it sometimes finds its way into the literature unannounced, even in the work of those who would prefer that it be exiled (see Reddy 1979:298-299). The conduit metaphor is such a part of idiomatic English that, “Practically speaking, if you try to avoid all obvious

conduit metaphor expressions in your usage, you are nearly struck dumb when communication becomes the topic" (Reddy 1979:299). Undoubtedly, it is employed numerous times even in this very discussion!

The conduit metaphor has an unmistakable presence in many of the code model quotations provided above. As a means of illustrating explicit use of the model within linguistics, additional examples are offered here.

Here is one example, wherein Sapir discusses the relationships of language and literature:

Languages are more to us than systems of thought transference. They are invisible garments that drape themselves about our spirit and give a predetermined form to all its symbolic expression. (Sapir 1921:221)

This particular quotation demonstrates a type of conduit metaphorism sometimes referred to as 'telementation', that is, "thought-transference" (Harris 1990:26, also see 1987:205). Telementation metaphorisms have often accompanied the conduit metaphor.

The following two quotations are both from a 1970 volume by Wallace Chafe.

Language enables a speaker to transform configurations of ideas into configurations of sounds, and it enables a listener within his own mind to transform these sounds back into a reasonable facsimile of the ideas with which the speaker began. (Chafe 1970:15)

The conversion of meanings into sounds allows humans beings to transfer ideas from one to another. (Chafe 1970:16)

In more recent years the conduit metaphor has seldom seen such explicit expression, typically being combined with information theoretic terminology, rather than occurring independently as is seen in these quotations.

As Reddy anticipates, the conduit metaphor exerts subtle pressure on much of linguistic theorizing (see Reddy 1979:302-303). This is not to suggest that theoreticians are incapable of thinking in other terms, but, rather, that there is a "gravitational pull" in the direction of the conduit metaphor. As Reddy cogently states: "I do not claim that we

cannot think momentarily in terms of another model of the communication process. I argue, rather, that that thinking will remain brief, isolated, and fragmentary in the face of an entrenched system of opposing attitudes and assumptions” (Reddy 1979:297-298).

Lakoff and Johnson offer helpful commentary on this type of relationship via their discussion of how we understand *new* metaphors. They suggest that new or unconventional metaphors gain intuitive value in two ways (and often through combination of the two):

- (1) by evoking, at least in part, a conventional metaphor which is already accepted as being true, and
- (2) by suggesting an alternative description which, while novel, can be readily identified as fitting a possible world (Lakoff and Johnson 1980:172-175).

Because of its overwhelming status as a means of expression in the common vernacular, the conduit metaphor carries tremendous intuitive value. That intuitive value is readily referred to new metaphors (such as information theory), provided the new metaphor may be easily rewritten or interpreted in conduit-metaphor terms. As will be discussed, such a rewriting is readily observable in some applications (or perhaps it would be better to say *misapplications*) of information theory.

3.2.2 Saussure's speech circuit

If the conduit metaphor can be said to provide subconscious motivation and apparent plausibility for the code model, then Saussurian structuralism can be said to provide the disciplinary context for the model. Ferdinand de Saussure is commonly considered the father of modern linguistics, and more specifically, the father of synchronic linguistics. In addition, he is regarded to be the father of structuralism as a philosophical perspective. The model of communication Saussure supported is a major constituent of the code model of communication.

Foremost among Saussure's tenets were the *langue-parole* distinction, the integrity of the *sign*, the principles of *linearity* and *arbitrariness*, and, of course, delimitation and validation of the *synchronic* approach for the study of language. Saussure's basic system was carried into the works of successors, such as Sapir and Bloomfield, with each contributing his own influence. In recent years, modern linguistics has modified some of these positions, assuming a weaker version—for example, nonlinear phonology required a modification to the principle of linearity—but Saussure's general influence remains quite strong. Undoubtedly, his strongest legacy is the synchronic approach to study, for this, more than any other, set apart linguistics as a discipline of its own.

As do many linguists of the present generation, Saussure introduced his teaching on general linguistics with a presentation of his model of communication. That model, which can be called the speech circuit, has strongly influenced subsequent generations of linguists. A relationship of mutual dependency exists between that conception of communication and Saussure's *langue*, for it is generally presumed that communication cannot proceed unless the parties participating maintain equivalent copies of a *langue*.

As shall be discussed, the fact that Saussure chose to characterize communication via a circuit model was to prove significant. In an age enamored with newly developed electronic communication systems, that characterization lent the model considerable apparent plausibility. It also set the stage for later integration of Saussure's model with the information theoretic model of communication borrowed from electrical engineering.

In considering the influence of Saussure's teaching on the development of modern linguistics, one should note that the majority of his influence has been somewhat indirect. While Saussure was apparently a powerful and insightful instructor and researcher, he was not an especially prolific writer. Best known today for his work in general linguistics, Saussure never actually published on the topic. His most influential work, *Cours de*

linguistique générale, was not directly authored by Saussure. Rather, it is an edited assemblage of his lecture notes and his students' class notes, published posthumously in 1816 by colleagues. (Interestingly, Saussure only lectured on general linguistics three terms, in 1907, 1908-09, and 1910-11.)

It should not be surprising, considering the nature of its construction, that within *Cours* there are at points apparent contradictions, both in theory and emphases. Students of linguistics have sometimes focused on certain sections of *Cours* to the relative neglect of others. In sections where Saussure himself seems to have been less than consistent, an inherent duality results, giving rise to internal debate.⁴ Commenting upon this duality, Jonathan Culler notes that occasionally theorists will even "draw upon Saussurian insights in order to contest what they take to be the principles of structuralism." Culler continues, stating, "the possibility of using Saussure, the original structuralist, in a critique of structuralism suggests, of course, that his work contains different lines of argument, whose angles and force must be calculated" (1986:9-10).

Considering the manner in which *Cours* was assembled, those who would engage the work with the hope of discovering the authentic Saussure do indeed pursue a daunting, if not elusive goal. Several useful works are available for those interested in studying the whole of the *Cours*.⁵ While such review is certainly worthwhile, it will not be the goal of the discussion here. Rather, the goal here is to describe how Saussure's work is related to the code model. The material covered is limited accordingly.

3.2.2.1 Saussure's innovations

During his lifetime, Saussure was best known for his work in historical-comparative linguistics. He was quite accomplished in that domain, even publishing a landmark paper on the topic when he was but a twenty-one-year-old student. The audience of today knows him better for two other developments which are typically attached to his

name, namely synchronic linguistics and structuralism, both of which ultimately extend from his work and theory building in the historical-comparative arena.⁶ The audience of today is perhaps less familiar with the history of linguistics preceding Saussure and how that history moved Saussure to innovation. J. E. Joseph explains:

At the time of Saussure's lectures, the study of language had been dominated for over 30 years by (a) historical work on the language of written texts (work which had only gradually come to be distinguished from 'philology,' inquiry aimed not at the language but at better understanding of the text itself); (b) dialectological work based on field investigation of local dialects; (c) phonetics, which demanded increasingly minute observation in strong adherence to the positivistic spirit; and (d) psychology, the principal domain of a global perspective on language (Joseph 1994:3664)

Dissatisfied with the direction in which the discipline seemed to be proceeding, Saussure taught an alternative perspective. Albeit unwittingly as far as Saussure was concerned, the result was to redirect the course of the entire discipline.

Saussure's problem was to delineate a study of language that would be neither historical nor ahistorical, neither psychological nor apsychological; yet more systematic than Whitney's general linguistics [(Whitney had died in 1894)], so as to be at least the equal in intellectual and methodological rigor to the historical, psychological, and phonetic approaches. His solution was to make a strong distinction between the study of language as a static system, which he called 'synchronic' linguistics, and the study of language change, which he called 'diachronic' linguistics (or, until 1908, 'evolutive'). (Joseph 1994:3664)

Harris and Taylor argue that these developments each align with a basic goal, so that the total impact was to break the surrogationalist tradition that had affected linguistic science for centuries, even from the time of the ancient Greeks:⁷

The whole of the *Cours de linguistique générale* is, in effect, dedicated to arguing that a language is not to be confused with a nomenclature. This confusion Saussure saw – rightly – as a major obstacle to understanding the systematicity of language. It is a confusion which is central to the thesis which is sometimes called 'surrogationalism', which has a venerable history in the Western tradition of theorizing about language. The surrogationalist views words as surrogates or proxies, having meaning by 'standing for' something else of a non-linguistic nature, and the central task of elucidating how language works as consisting in showing the various types of relationship between words and what they stand for. In short, surrogationalism seeks to explain language in

terms of relationship between language and what exists independently outside language. For Saussure, surrogationalism embodies a profound misconception of how language works. The systematicity of language cannot be explained simply by seeking correlations between individual linguistic signs and objects, or events, or classes thereof in the world outside. (Harris and Taylor 1997:221)

Contemporary readers may not readily grasp the significance of Saussure's struggle against nomenclaturism. The historical-comparative tradition, then the prevailing approach to linguistic studies, was a somewhat different science than is historical-comparative linguistics of today. Historical-comparativists saw as their task the tracing of 'evolutionary' patterns in sound change; the linguist would identify individual words, then trace their history through time and through the various daughter languages where they were represented. In Saussure's opinion, this was an entirely inadequate account of language, if indeed it was accounting for language at all. Harris explains:

Where historical philology had failed, in Saussure's opinion, was in simply not recognising the structural nature of the sign. As a result, it had concentrated upon features which were merely superficially and adventitiously describable in mankind's recorded linguistic history. The explanations philological historians provided were in the final analysis appeals to the past. They did not – and could not – offer any analysis of what a language is from the viewpoint of its current speakers. Whereas for Saussure it was *only* by adopting the users' point of view that a language could be seen to be a coherently organized structure, amenable to scientific study. For linguistic signs, Saussure insisted, do not exist independently of the complex system of contrasts implicitly recognised in the day-to-day vocal interactions of a given community of speakers. (Harris 1983:xi)

The notion of signs was not itself a new invention, even being anticipated in the philosophy of Aristotle (see Harris and Taylor 1997:20-35, Joseph 1994:3666). For example, Aristotle writes:

Spoken sounds are symbols of impressions in the mind, and what is written are symbols of what is spoken. Speech, like writing, is not the same for all mankind, although the mental impressions directly expressed by these signs are the same for all, as are the things of which these mental impressions are likenesses. (Aristotle: *De Interpretatione* I; trans. in Harris and Taylor 1997:21)

In part, this tradition continued with Saussure, but Saussure made two very significant adjustments: (1) he considered the sign to be independent of both actual objects (to which the concept may be related) and actual sounds (to which the signifying word may relate), and (2) he insisted that if one was to engage in a *linguistic* analysis, then the sign must remain intact; signified and signifier could not be isolated. *Cours* describes the relationship so: “A linguistic sign is not a link between a thing and a name, but between a concept and a sound pattern. The sound pattern is not actually a sound; for a sound is something physical. ... The linguistic sign is, then, a two-sided psychological entity” (Saussure 1983:[98-99]).⁸ (See figure 3.2.)

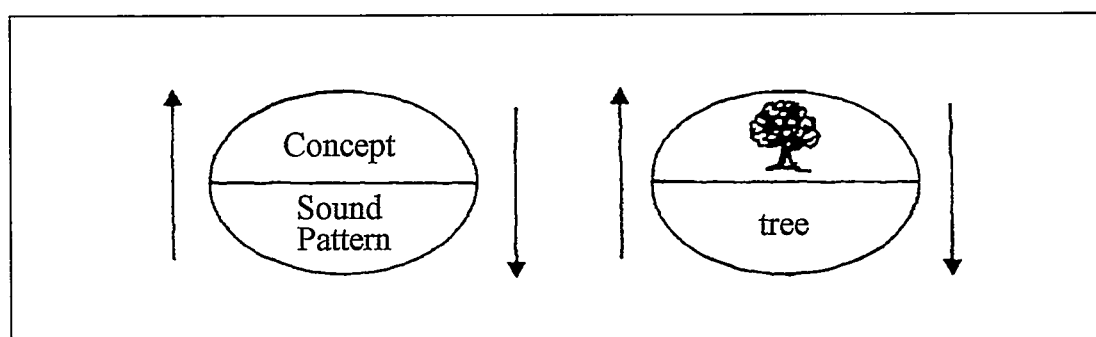


Figure 3.2. Saussure's graphic representation of the sign, translation by Harris (after Saussure 1983:[99]).

Joseph elaborates on Saussure's notion of the sign:

For Saussure, the network of linguistic signs which constitute *langue* is made up of the conjunction of a *signifiant* ('signifier'), understood as a sound pattern deposited in the mind, and a *signifié* ('signified'), a concept that is also deposited in the mind. ... It is important to note that the signifier is wholly distinct from the actual uttered word, as is the signified from the actual physical thing conceived of (if one exists). Although the distinction between concept and object has existed since antiquity, that between sound pattern and actual sound is Saussure's own contribution (Joseph 1994:3666-3667)

Saussure employs a powerful analogy in describing this relationship between signifier and signified, one which helps to emphasize its importance within the system he envisioned:

Linguistic structure might be described as the domain of articulation Every linguistic sign is a part or member, an *articulus*, where an idea is fixed in a sound, and a sound becomes the sign of an idea.

Just as it is impossible to take a pair of scissors and cut one side of paper without at the same time cutting the other, so it is impossible in a language to isolate sound from thought, or thought from sound. To separate the two for theoretical purposes takes us into either pure psychology or pure phonetics, not linguistics.

Linguistics, then, operates along this margin, where sound and thought meet. *The contact between them gives rise to a form, not a substance.* (Saussure 1983:[156-157]; italics in original)

In isolating the sign from the actual articulation of the sound *as well as* from the external object, Saussure dichotomized language as it had previously been conceived. Developing two senses of the term language (*langage*) into individual concepts by extending senses of the terms *langue* and *parole*, Saussure argued that the focus of linguistics should be *langue*, the shared system of signs which made communication possible. This system was to be distinguished from actual production, which he termed *parole*. Previous generations of linguists had focused their efforts on studying elements of production, such as written texts, spoken dialects, and phonetics, all of which were accessible and open to scrutiny within the positivistic tradition. In contrast, Saussure argued for the study of the system underlying production, even though that system was not directly observable (Joseph 1994:3665).

The relationships between signs in mental space were to be a crucial component in Saussure's concept of *langue*. He categorized this network of relationships as being of two kinds: (a) "syntagmatic (i.e., items are arranged in a consecutive, linear order)," and (b) "associative, later termed 'paradigmatic' (i.e., the organization of units in a deeper fashion

dealing with grammatical and semantic relations)” (Koerner 1994:3663). Insightfully, he regarded sounds and meanings to be organized in a similar manner:

Before Saussure, the syntagmatic relations of morphemes within a given utterance were certainly recognized as a matter of linguistic concern, though relatively neglected. But there was little or no precedent for the idea suggested by the *Cours* (implicitly if not explicitly) that there exists a syntax not only of words, but of sounds, meanings, and the relations uniting them; or that every time a sound, word, or meaning is chosen, a vast network of related elements is summoned up in absentia. The latter concept in particular set the study of language on a new course of abstraction that did not rely on psychological theorizing, but remained internal to language.

In many ways, the Saussurean notion of paradigmatic and syntagmatic relations would become the hallmark of twentieth-century linguistics: first, because it proposed that a single principle of structure unites all the levels at which language functions—sound, forms, and meanings; second, because it suggests a way of analyzing language that would not depend on a simple listing of elements with their ‘translation’ into either another language or some sort of philosophical interpretation. Elements could henceforth be analyzed according to the relations they maintained with other elements, and the language could be understood as the vast system—not of these elements—but of these relations. This was the point of departure for structuralism. (Joseph 1994:3668)

The structuralist tradition developed in response to *Cours* is a direct result of this characterization of *langue*, which may be described as “a network of pure relations” (Joseph 1994:3668).

Certainly the most wide-reaching Saussurean intellectual tradition, both within and outside of linguistics, derived from Saussure’s characterization of *langue* as a wholly self-contained network of relationships among elements which ... have no positive content or value, but only the negative value generated by their differing from one another. (Joseph 1994:3668)

The notion of value was a key component in Saussure’s characterization of *langue* (1983:[155-169]). As Saussure conceived it, the signs were defined in terms of one another, much as the values of the commodities in an economic system are defined by the system of exchange employed in that system. This is not to say that the value of a dollar is defined as ten dimes—a simple change in denomination. Rather, Saussure considered the relations in *langue* to be analogous to the *values* established, as in the exchange of ninety cents for a dozen eggs, or a dozen eggs for a loaf of bread (1983:[160]). Saussure

recognizes that individual exchanges were arbitrary, but considered the system as a whole to be fixed by the totality of internal relations. In other words, if the rate were altered for a single exchange, then, in turn, all other exchanges would be affected by the disturbance in equilibrium.⁹ The system is fixed through this equilibrium, so that the system maintains itself through its inherent resistance to change.

Saussure saw a similar system of values in the relationships between signs. The result was his characterization of the *langue*, the system of signs and their relations, as a fixed system. Harris explains:

The Saussurean answer to the question 'What fixes the code?' is that what fixes the individual signs is their reciprocal interdependence in a system, which in turn is fixed simply by the totality of internal relations between its constituent signs. That explains simultaneously why altering just one set of relations disturbs the whole system, and also why, in spite of the arbitrary *connexion* between any one signifiant and any one *signifié*, it is not easy to break that connexion. Altering just one sign encounters the passive resistance of the entire structure. Thus everything in la langue is fixed by its structural interdependence with the rest, in the same way that the rungs of a ladder are held in position by being inserted into the vertical struts, which in turn are held in position by the rungs. (Harris 1987:220)

In Saussure's view, the conception of *langue* as an integrated, fixed system mandated the dichotomization of diachronic and synchronic perspectives:

It was a position which committed Saussure to drawing a radical distinction between diachronic (or evolutionary) linguistics and synchronic (or static) linguistics, and giving priority to the latter. For words, sounds, and constructions connected solely by processes of historical development over the centuries cannot possibly, according to Saussure's analysis, enter into structural relations with one another, any more than Napoleon's France and Caesar's Rome can be structurally united under one and the same political system. (Harris 1983:x)

The term synchronic describes an approach "concerned with the complex of events existing in a limited time period and ignoring historical antecedents" (Mish 1983:1197). The idea that language should, or even could, be regarded in such a manner was largely a Saussurean innovation. Harris and Taylor explain the necessity of this move:

It made no sense to suppose that the earlier *b* was ‘the same consonant’ as its later manifestation *p*, or that ‘the same word’ appeared in Latin as *causa* but later in French as *chose*. For if linguistic units did not exist except as structural units defined within a single linguistic system, it was impossible for any given unit to ‘survive’ from one system *A* into a different system *B* at a later point in time. (Harris and Taylor 1997:215)

3.2.2.2 Saussure’s theory of communication

Saussure introduces his model of communication in chapter 3 of *Cours*, calling the model *circuit de la parole*, sometimes translated as the ‘speech circuit’. Because of its title in French, some readers have considered the model and its related discussion to be a presentation of *parole*. As Harris points out, such a reading unnecessarily threatens the logical argument offered in *Cours*, for viewed in that manner it would seem that Saussure is begging the question, presuming the *parole* half of his *langue-parole* dichotomy and then using *parole* in arguing for *langue*. While such an interpretation remains open for debate, it may be more reasonable to interpret the *circuit de la parole* simply as a model of communication, rather than a model of speech (*parole*) *per se*. Such an account would explain why the model occurs so early in *Cours*, for as a model of communication, it serves to establish a foundation for the main argument of *Cours*. If the material is, indeed, intended to be foundational, that is, setting the stage for later argumentation, then it comes as no surprise that it appears early in the *Cours* (Harris 1987:21-25, 204-205). Saussure introduces the model in the following manner:

In order to identify what role linguistic structure plays within the totality of language, we must consider the individual act of speech and trace what takes place in the speech circuit. This act requires at least two individuals: without this minimum the circuit would not be complete. Suppose, then, we have two people, *A* and *B*, talking to each other: [see figure 3.3]

The starting point of the circuit is in the brain of one individual, for instance *A*, where facts of consciousness which we shall call concepts are associated with representations of linguistic signs or sound patterns by means of which they may be expressed. Let us suppose that a given concept triggers in the brain a corresponding sound pattern. This is an entirely *psychological* phenomenon, followed in turn by a *physiological* process: the brain transmits to the organs of phonation an impulse corresponding to the pattern. Then sound waves are sent

from *A*'s mouth to *B*'s ear: a purely *physical* process. Next, the circuit continues in *B* in the opposite order: from ear to brain, the physiological transmission of the sound pattern; in the brain, the psychological association of this pattern with the corresponding concept. If *B* speaks in turn, this new act will pursue – from his brain to *A*'s – exactly the same course as the first, passing through the same successive phases, which we may represent as follows: [see figure 3.4]

Saussure's diagrams and descriptions are of course simple generalizations, intended to capture those elements which he considered essential. Concerning their simplicity, Saussure comments:

This analysis makes no claim to be complete. One could go on to distinguish the auditory sensation itself, the identification of that sensation with the latent sound pattern, the patterns of muscular movement associated with phonation, and so on. We have included only those elements considered essential; but our schematisation enables us straight away to separate the parts which are physical (sound waves) from those which are physiological (phonation and hearing) and those which are psychological (the sound patterns of words and the concepts). It is particularly important to note that the sound patterns of the words are not to be confused with actual sounds. The word patterns are psychological, just as the concepts associated with them are. (Saussure 1983:[27-29])

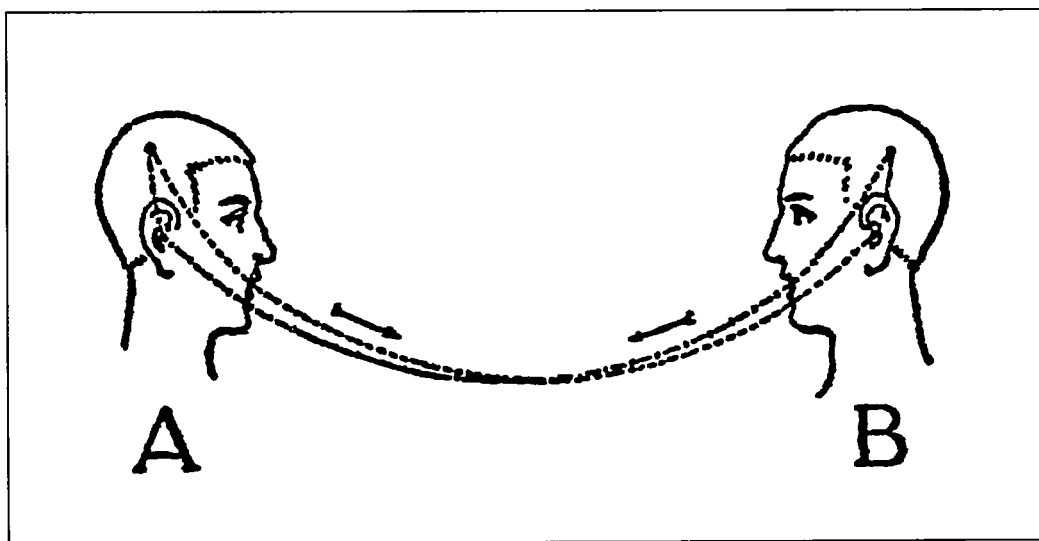


Figure 3.3. Saussure's diagram of the speech circuit as published in *Cours* (Saussure, et al. 1972:[27]).

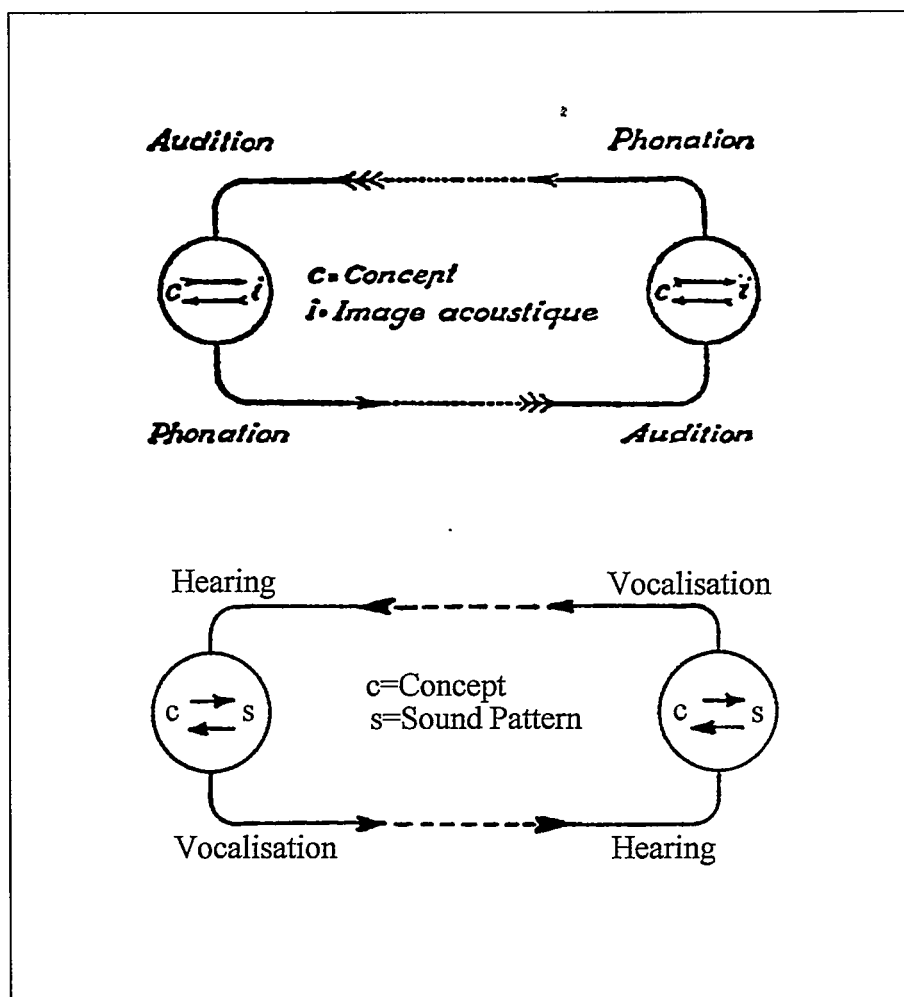


Figure 3.4. Saussure's schematic of the speech circuit as published in *Cours* (Saussure, et al. 1972:[28]), with English translation by Harris (after Saussure 1983:[28]).

While contemporary readers may readily note the influence of Saussure's work in contemporary theories, it is less likely that they will be familiar with theories which influenced Saussure. The present discussion is particularly concerned with one source of influence, as that source seems to have strongly shaped Saussure's model of communication. Specifically, Saussure's model depends heavily upon a psychological explanation of oral communication expounded by the British philosopher John Locke in

his 1706 volume, *An Essay Concerning Human Understanding* (see Harris 1987:205; Locke 1975). Since *Cours* was assembled from classroom lectures, rather than being written as a book, it only rarely identifies background references. While Locke is not explicitly identified in *Cours*, there are great similarities between the models offered by Locke and Saussure, as well as important overlaps in terminology.

When viewed from a historical perspective this relationship is interesting, but from a theoretical perspective it is crucial. Whereas Locke and Saussure share the model of communication as presupposition, they share neither motivation nor supporting theories. Accordingly, they apply the model in very different ways. Locke, employing the model in a study of epistemology, dissects the process of human communication accordingly, addressing weak links in the chain. Saussure, employing the model in account of human language, comparatively neglects the very issues upon which Locke had focused, and maintains several weaknesses in his theory as a result. Of course, one must offer such a critique with a bit of a disclaimer. Saussure himself may have understood these weaknesses, while his posthumous editors did not.¹⁰ Whatever the case, the relationship between Locke and Saussure illuminates the model of communication they jointly presume. Furthermore, it facilitates discussion of weaknesses in Saussure's account, by contrasting his use of the model against Locke's. As in previous sections, attention here will be focused on material pertinent to analysis of the code model.

Locke describes the basic components of his model of communication as follows:

Man, though he have great variety of Thoughts, and such, from which others, as well as himself, might receive Profit and Delight; yet they are all within his own Breast, invisible, and hidden from others, nor can of themselves be made appear. The Comfort, and Advantage of Society, not being to be had without Communication of Thoughts, it was necessary, that Man should find out some external sensible Signs, whereby those invisible *Ideas*, which his thoughts are made up of, might be made known to others. For this purpose, nothing was so fit, either for Plenty or Quickness, as those articulate Sounds, which with so much Ease and Variety, he found himself able to make. Thus we may conceive how *Words*, which were by Nature so well adapted to that

purpose, come to be made use of by Men, as *the Signs of their Ideas*; not by any natural connexion, that there is between particular articulate Sounds and certain *Ideas*, for then there would be but one Language amongst all Men; but by a voluntary Imposition, whereby such a Word is made arbitrarily the Mark of such an *Idea*. The use then of Words, is to be sensible Marks of *Ideas*; and the *Ideas* they stand for, are their proper and immediate Signification.

The use Men have of these Marks, being either to record their own Thoughts for the Assistance of their own Memory; or as it were, to bring out their *Ideas*, and lay them before the view of others: *Words in their primary or immediate Signification, stand for nothing, but the Ideas in the Mind of him that uses them*, how imperfectly soever, or carelessly those *Ideas* are collected from the Things, which they are supposed to represent. When a Man speaks to another, it is, that he may be understood; and the end of Speech is, that those Sounds, as Marks, may make known his *Ideas* to the Hearer. That then which Words are the Marks of, are the *Ideas* of the Speaker: Nor can any one apply them, as Marks, immediately to anything else, but the *Ideas*, that he himself hath: For this would be to make them Signs of his own Conceptions, and yet apply them to other *Ideas*; which would be to make them Signs, and not Signs of his *Ideas* at the same time; and so in effect, to have no Signification at all. Words being voluntary Signs, they cannot be voluntary Signs imposed by him on Things he knows not. (Locke 1975: Book III, Chapter 2, Sections 1-2)

It is evident that both Locke and Saussure draw upon theoretical tradition much older than themselves. Even Plato's account of Socrates' teaching demonstrates dependence upon such a theory (see *Cratylus*; Harris and Taylor 1997:1-19), for Plato's theory reveals an "underlying assumption ... that every common name must have a fixed meaning, which we think of when we hear the name spoken: speaker and hearer thus have the same object before their minds. Only so can they understand one another at all and any discourse be possible" (Cornford 1935:9; see Harris 1987:205). Parkinson (1977) suggests such models involve a 'translation theory' of understanding. Harris comments:

The term 'translation theory' refers to the fact that, according to the theory in question, when language is the vehicle of communication understanding requires a double process of 'translation': a speaker's thoughts are first translated into sounds, and then the sounds uttered are translated back again into thoughts by the hearer. (Harris 1987:205)

Concerning the theoretical perspective borrowed from Locke, Harris comments:

Saussure simply takes over two basic claims of this old psychological theory and incorporates them as premisses in his model. These are: (i) that communication is a process of 'telementation' (that is, of the transference of thoughts from one human mind to another), and (ii) that a necessary and

sufficient condition for successful telementation is that the process of communication, by whatever mechanisms it employs, should result in the hearer's thoughts being identical with the speaker's. (Harris 1987:205)

3.2.2.2.1 Thought without language?

An understanding of Locke's theory is important to the present discussion because of the relationship between the theories of Locke and Saussure. As mentioned, Locke was concerned with epistemology and in particular with how the objects of thought, which he calls ideas rather than the more contemporary term concepts, are acquired through the faculties available. As an empiricist, he was concerned with developing an experientialist account which would elevate experience and counter elements of the Cartesian method, wherein Descartes presumed certain categories of thought to be innate and experience to be questionable. Locke did not, however, assume that language was necessary for either the construction of thought, or for its organization. This position was of course related to his ideas regarding links between linguistic and non-linguistic referents. It was also to be a point upon which Saussure defined his own theory, but in opposition to Locke's, rather than in agreement (see figure 3.5). Harris explains:

Locke evidently supposed that there could be thought without language, and that the mind could engage in it without the aid of any linguistic instrument. 'Language does not exist, then, because man is a rational being; it exists, according to Locke, because man is "a sociable creature", and language is "the great instrument and common tie of society"' (Parkinson 1977:2). Saussure emerges as a sceptic on this score. He does not explicitly discuss the question of whether or to what extent human beings could think without language, but he describes prelinguistic thought as amorphous. 'Psychologically, setting aside its expression in words, our thought is simply a vague, shapeless mass' ([155]). More specifically still, '...were it not for signs, we should be incapable of differentiating any two ideas in a clear and consistent way ...No ideas are established in advance, and nothing is distinct, before the introduction of *la langue*' ([155]). This marks a significant shift of emphasis away from Locke, and meshes with an important historical evolution in the philosophical status of linguistic inquiry, which is characteristic of the late nineteenth and twentieth centuries. The evolution in question tends toward seeing language not as a gratuitous social bonus for purposes of communication, but as a *sine qua non* for the articulation of any analytic structure of ideas whatsoever. (Harris 1987:209; bracketed references refer to Saussure's *Cours*)

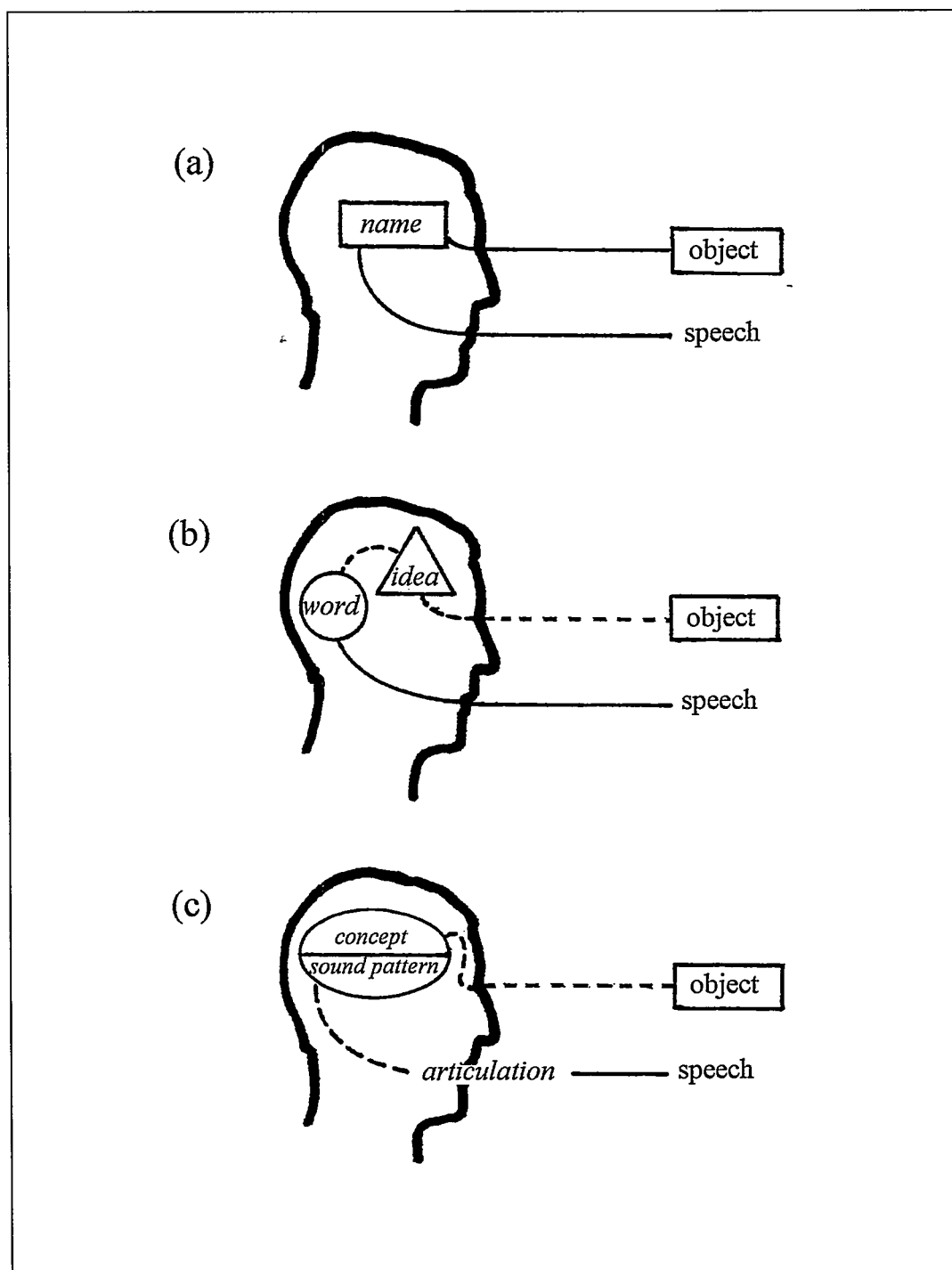


Figure 3.5. Three views of the relationship between linguistic and nonlinguistic referents: (a) nomenclaturist/surrogationalist, (b) Lockean, (c) Saussurean.

3.2.2.2.2 Saussure's "pure form" and Locke's "substance"

The manner in which Saussure envisioned the structure of *langue* seems to have been influenced by Locke as well, although more subtly than with the speech circuit.

Locke's philosophy was shaped by his adoption of the corpuscularian view of science espoused by Robert Boyle. In line with that position, Locke asserted that sensations weren't just assemblages of properties generated by random bunches of miniscule components (corpuscles). Rather the components were composed, held together into structures via their substance. Scott-Kakures, et al. comment:

On the corpuscularian view, the ultimate things in the world are corpuscles—bits of matter, or material substance, with properties. The substance is what the properties "subsist" in. Properties do not just float about; they are properties of some "thing." But what is this thing, or substance? And how can we know it? Can we have an idea of it?

Locke's answer to these questions is that, "... not imagining how these simple ideas *can* subsist by themselves, we accustom ourselves to suppose some *substratum* wherein they do subsist, and from which they do result, which therefore we call *substance*." ... So, the tomato is not just roundness plus redness. It is a substance in which roundness and redness "subsist." (Scott-Kakures, et al. 1993:175; embedded quotation from Locke, *Essay*, II, xxiii, 1)

In contemporary usage, substance is equated with matter. For Locke, however, substance does not equate with matter; in developing the term substance he is not necessarily referring to a tangible thing which may be measured or poured. For Locke, matter is, in a sense, a type of substance together with its respective *solid* corpuscles and "power" (that is, its qualities in regard to affects). Substance, then, is the "stuff" of which the corpuscles are made, and by which they are held together into meaningful bodies. Locke's general reference to corpuscles includes solid atomic units, as occur in matter, but it also includes spiritual, and *ideal* (i.e., mental) atomic units. Accordingly, substance may be non-material in nature. Substance, then, refers to a vague, indefinable "unknown something that holds qualities together—a substratum in which qualities 'inhere'" (Scott-Kakures, et al. 1993:176).¹¹ Locke also writes of *particular* substances, which are

particular collections of properties, or “ideas,” that are united together (Scott-Kakures, et al. 1993:177).

As contemporary readers might anticipate, this idea of substance was problematic for Locke’s theory. His explanation of the concept was weak, at least, and perhaps even evasive. Scott-Kakures, et al. write:

The idea of substance is itself not very clear. Indeed, it is not, to use the traditional terminology, “clear and distinct” but is rather “relative and confused,” insofar as we have no direct experience of substance and can know it only in relation to the qualities of which we do have direct experience. If pressed on what this thing is in which qualities inhere, Locke answers that it is the “solid, extended parts”—corpuscles. But as he points out, the question may be continued: What do solidity and extension inhere in? And to that question, Locke says it is a “something, I know not what.” (Scott-Kakures, et al. 1993:175-176)

The notion of substance was subject to severe criticism by later philosophers, notably George Berkeley, who was very antagonistic to Boyle’s corpuscularian science and Locke’s corpuscularian philosophy (Scott-Kakures, et al. 1993:187ff). Nineteenth century developments in atomic theory would eventually answer some of Locke’s questions in regard to matter and solid “corpuscles,” but similar questions concerning nonmaterial substance were not to be so blessed.

This problem is in itself an important clue to interpreting Saussure. While recognizing Locke’s views regarding substance as flawed, Saussure nevertheless identified the benefit such a theory of composition would prove for his own purposes. The evolutionist view in historical comparative studies had identified and treated cognates and their sound change via the methodological equivalent of an historical tunnel.¹² The result was to regard these sound changes as being relatively unconnected, independent from a system or structure. Cast in Lockean terms, this approach to language involved a regard for the “qualities,” with no sense of the “substance” in which those qualities “inhere.” While Saussure was not a corpuscularian nor particularly concerned with epistemology, he

agreed with Locke regarding the necessity of a structure in which “qualities” exist. He writes:

The notion of value ... shows us that it is a great mistake to consider a sign as nothing more than the combination of a certain sound and a certain concept. To think of a sign as nothing more would be to isolate it from the system to which it belongs. It would be to suppose that a start could be made with individual signs, and a system constructed by putting them together. On the contrary, the system as a united whole is the starting point, from which it becomes possible, by a process of analysis, to identify its constituent elements. (Saussure 1983:[157])

How, then, was Saussure to posit such a structure without evoking criticism similar to that received by Locke? Whereas Locke had expounded a nonmaterial substance composed of a nonmaterial “stuff,” Saussure proposed a structural form composed purely of differences between nodes, with no “substance.” Saussure writes:

In the language itself, there are only differences. Even more important than that is the fact that, although in general a difference presupposes positive terms between which the difference holds, in a language there are only difference, *and no positive terms.* Whether we take the signification or the signal, the language includes neither ideas nor sounds existing prior to the linguistic system, but only conceptual and phonetic differences arising out of that system. In a sign, what matters more than any idea or sound associated with it is what other signs surround it. (Saussure 1983:[166])

In other words, there is no “stuff,” neither between the signs, nor in the signs themselves. As Saussure himself puts it, “Linguistics, then, operates along this margin, where sound and thought meet. *The contact between them gives rise to a form, not a substance*” (Saussure 1983:[157]), and elsewhere, “... *the language itself is a form, not a substance.* The importance of this truth cannot be overemphasised. For all our mistakes of terminology, all our incorrect ways of designating things belonging to the language originate in our unwittingly supposing that we are dealing with a substance when we deal with linguistic phenomena” (Saussure 1983:[169]).

3.2.2.2.3 The nature of concepts: Locke vs. Saussure

As was mentioned previously, combating surrogationalism was a major thrust of *Cours*. While Locke does not quite break free of the nomenclaturist tradition, he did make some important inroads, which undoubtedly influenced Saussure. As opposed to other nomenclaturists, Locke considered the word to be linked to the *idea* (i.e., concept), rather than to the extra-mental object (see Harris 1980:67f). This was a key component in Locke's theory, for as an epistemologist, he noted that ideas, or concepts, included subjective elements and evaluations, which were not consistent between thinkers, despite the fact that a set of spoken vocabulary applied to a specific topic may be relatively consistent between speakers. As quoted previously, Locke writes:

The use then of Words, is to be sensible Marks of *Ideas*; and the *Ideas* they stand for, are their proper and immediate Signification. ... *Words in their primary or immediate Signification, stand for nothing, but the Ideas in the Mind of him that uses them, how imperfectly soever, or carelessly those Ideas are collected from the Things, which they are supposed to represent.* (Locke 1975: Book III, Chapter 2, Sections 1-2)

Concerning this component of their theories, the major difference between Locke and Saussure is the nature of these ideas and the strength of the link between the mental word and the mental concept. While Locke considered the word to be linked to the idea (or concept), rather than to an extra-mental object, he did not consider the idea itself to be linguistic. Accordingly, he did not posit an especially strong link between concept and word. Harris comments:

Where Saussure's speech circuit marks an advance over Locke is that Locke's account is still basically a form of nomenclaturism (Harris 1980:67ff). For Locke, words 'stand for' ideas in the mind: but the mind forms its ideas independently of language. Saussure rejects this psychocentric surrogationalism in favour of giving theoretical priority to the linguistic sign itself (envisaged as an indissoluble combination of *signifiant* and *signifié*). A compromise with Locke is still visible in one feature, however. 'Concepts' remain, in Saussure's account, the prime movers in the activity which occupies the speech circuit: they 'trigger' a process which would have no other plausible starting point. (Harris 1987:213)

For Saussure, the indivisibility of the sign provided an essential constancy of the *langue*, which he considered necessary for the ordering of thought. In the *Cours* the position is introduced in the following manner:

Psychologically, setting aside its expression in words, our thought is simply a vague, shapeless mass. Philosophers and linguists have always agreed that were it not for signs, we should be incapable of differentiating any two ideas in a clear and constant way. In itself, thought is like a swirling cloud, where no shape is intrinsically determinate. No ideas are established in advance, and nothing is distinct, before the introduction of linguistic structure. (Saussure 1983:[155])

Accordingly, Saussure considered it self-evident that the members of a speech community, if they are to communicate, must share a system which provides order to that vague, shapeless mass of thought.

It is important to recognize that, in Saussure's view, *langue* was not simply a psychological structure in the individual human mind. It was, moreover, a 'social fact'. The emphatic quality of his position on the issue strongly impacted linguistics for several decades. With hindsight, one may conjecture that Saussure's emphasis on the issue reflected a rhetorical posture more so than it did a real opposition to psychological investigation. In fact, Saussure's own approach showed more interest in the workings of the mind than did that of his contemporaries in linguistics. But his position starkly contrasts with the psychology of his day, and that seems to have been one of Saussure's goals. Accordingly, in defining the place of linguistics *as distinct from psychology*, he strongly emphasized the social nature of language (Joseph 1994:3665-3666).

As Saussure saw it, this social quality made communication possible not only through the systematic quality and fixed status of *langue* in the individual, but through its *relative constancy* throughout a speech community.

All the individuals linguistically linked in this manner will establish among themselves a kind of mean; all of them will reproduce—doubtless not exactly, but approximately—the same signs linked to the same concepts. ... If we could

collect the totality of word patterns stored in all those individuals, we should have the social bond which constitutes their language. It is the fund accumulated by the members of the community through the practice of speech, a grammatical system existing potentially in every brain, or more exactly in the brains of a group of individuals; for the language is never complete in any single individual, but exists perfectly only in the collectivity. (Saussure 1983:[29-30])

While the indivisibility of the concept and acoustic image in the sign was an essential component in Saussure's characterization of *langue*, the opposing position was similarly important for Locke. A strong link between word and idea would have been detrimental to his argument regarding the weakness of human communication and the imperfection of words (see Harris and Taylor 1997:126-138). Locke recognized that words (that is, articulations) employed by a community could remain relatively constant, but he noted that the ideas to which these words were supposedly linked did not have to maintain the same degree of consistency, not between individuals and not even within the mind and usage of a single individual. This he rightly recognized as a problem for communication as he had described it. Locke writes:

To make Words serviceable to the end of Communication, it is necessary, (as has been said) that they excite, in the Hearer, exactly the same *Idea*, they stand for in the Mind of the Speaker. Without this, Men fill one another's Heads with noise and sounds; but convey not thereby their Thoughts, and lay not before one another their *Ideas*, which is the end of Discourse and Language. But when a word stands for a very complex *Idea*, that is compounded and decompounded, it is not easy for Men to form and retain that *Idea* so exactly, as to make the Name in common use, stand for the same precise *Idea*, without any the least variation. Hence it comes to pass, that Men's Names, of very compound *Ideas*, such as for the most part are moral Words, have seldom, in two different Men, the same precise signification; since one Man's complex *Idea* seldom agrees with another's, and often differs from his own, from that which he had yesterday, or will have to morrow. (Locke 1975: Book III, Chapter 9, Section 6)

How was Locke able to maintain this model of communication even while seeming to argue against its adequacy? The answer again rests in his views as a corpuscularian. In that view, all perceptions, or "ideas of sensation," were considered to result from either primary and secondary qualities. The primary qualities were considered

to be the *real* qualities of material objects, and thus the sensations resulting from the primary qualities were considered to be objective. As Scott-Kakures, et al. explain, "Corpuscles are colorless, odorless, tasteless, soundless bits of matter moving about in space. The only properties that corpuscles really have are size, shape, mass, and motion or rest—the primary qualities" (1993:169). The secondary qualities, however, were not thought to resemble anything in the object. These are qualities such as color, taste, texture, odor, temperature, sound, and so on (Scott-Kakures, et al. 1993:168).

As an experientialist, Locke considered all one might know about to result ultimately from experience. The sensations resulting from primary and secondary qualities could then be manipulated through reflection. Finally, the resulting ideas could be assembled in increasing levels of complexity, depending upon the nature of their construction. Those which depended upon sensation alone were called simple ideas, and these were more or less reliable depending upon the extent to which they were generated by primary or secondary qualities.¹³ Complex ideas were thought to be analyzable into simple ideas; however, they were not thought to be as reliable or consistent. This was because they reflected an assemblage of simple ideas, including *both* primary and secondary qualities, and because that assembly process was the result of reflection (Scott-Kakures, et al. 1993:167). The resulting assemblage of unreliable and inconsistent ideas is the epistemological stumbling block Locke addresses when he writes:

But when a word stands for a very complex *Idea*, that is compounded and decomposed, it is not easy for Men to form and retain that *Idea* so exactly, as to make the Name in common use, stand for the same precise *Idea*, without any the least variation. (Locke 1975:Book III, Chapter 9, Section 6)

Accordingly, while Locke identified weak links in the process of human communication, he did not consider his model of communication to describe or display those weak links. Rather, he saw the weakness of human communication to be in the

nature of ideas. He would have expected communication as he described it to work *flawlessly* to the extent that the participants were “conveying thoughts” of a “simple” nature reflecting primary qualities. The effectiveness and reliability of the communication process would then begin to breakdown as the thoughts being conveyed became increasingly “complex.”

3.2.2.2.4 Why borrow from Locke?

Considering the differences between Locke’s and Saussure’s theories of language, one might wonder why Saussure, working at the advent of the twentieth century, would have resuscitated Locke’s late seventeenth century model in developing a new science of linguistics. After all, Locke’s model seemed to be particularly interested in the *parole* and it did not include any counterpart to the *langue*. Harris suggests that in using Locke’s model, which he knew to be inadequate, Saussure created an opportunity to develop the notion of *langue* and then argue for its theoretical necessity. Thus Saussure built into his model “a double guarantee of autonomy: (i) autonomy of linguistics among the disciplines dealing with human speech behavior, and (ii) autonomy of the study of *la langue* within linguistics” (Harris 1987:212-213).

While this autonomy did in fact follow the adoption of Saussure’s theory and model, it is not likely that Saussure intentionally adopted a model he considered flawed just so that he could argue for the patch with which to repair it. While such a rhetorical approach is occasionally employed in argumentation, there is no indication in *Cours* that Saussure intended such an approach in his account of the speech chain. The fact that Saussure gives so much energy toward developing a theory of *langue* clearly indicates that he did, indeed, recognize certain inherent weaknesses in Locke’s account, and that he considered the speech circuit (with *langue* intact) to be theoretically superior to Locke’s

model; however, Saussure likely adopted Locke's model as a starting point for the simple reason that it *was* the starting point for his generation.

Harris also addresses the related question of why Saussure's *critics* did not object to his resuscitating a seventeenth century model of communication (1987:213). He suggests that the major reason for this lies in technology. Saussure envisioned communication to function via a energy-conversion process. Accordingly, he retrofitted Locke's model with stylish technological terminology. Harris writes:

Why, it may be asked, should energy-conversion strike a linguist of Saussure's generation as a plausible exemplar for explaining speech communication? To answer this, we need look no further than the major technological innovations in communication which transformed everyday life in western industrial society during the course of the nineteenth and early twentieth centuries. They were telegraphy, telephony and broadcasting: all forms of energy-conversion applied to the transmission of verbal messages. It can hardly be a coincidence that the illustration of A and B talking in the course shows them schematically linked by what look suspiciously like telephone wires [(see again figure 3.3)]. Nor is it a coincidence that the misapplied term *circuit* which Saussure borrowed for his own model of speech communication comes from the technical vocabulary of the electrical engineer. By representing speech as a closed, casually determined process in every way analogous to the energy-conversion processes of physics and chemistry, linguistics was provided in advance with a forged *carte d'entrée* to the prestigious palace of modern science. (Harris 1987:215-216)

In describing the model as a circulating loop, or circuit, Saussure recast the basic model in electromechanical terms. This terminological adjustment would later contribute to the integration of the speech circuit with the electrical engineering-based model of communication as introduced by Claude Shannon.

3.2.2.3 The diffusion of Saussure's speech circuit model throughout the discipline of linguistics

Models of communication offered in linguistic literature prior to the publication of Shannon's information theory (1948) often demonstrate conceptual similarity to the code

model, but they do not employ the information theoretic terminology characteristic of the code model. They tend, rather, to rely upon Saussure's speech circuit.

Referencing de Mauro (1972:366), Harris notes that "Saussure had already become compulsory reading for linguists within five years of the publication of the *Cours*, which was widely reviewed" (1987:xi). However, at the time *Cours* was posthumously published, Saussure was better known for his work in historical-comparative linguistics and in particular for his writings on the topic of Indo-European vowels.¹⁴ Accordingly, it was several more years before the full impact of *Cours* began to be felt. In light of this delay, Harris comments: "These attested cases of historical myopia go to reinforce the thesis that Saussure falls into that Shakespearian category of those who, retrospectively, 'have greatness thrust upon them'" (Harris 1987:xii).

Joseph reports that "the full implications of Saussure's view of *langue* were realized in Prague" by Trubetzkoy and Jakobson, while "strikingly similar projects were underway in other quarters:" in the USA with Bloomfield, in Denmark with Hjelmslev, and in France with Meillet, who in turn passed the Saussurean perspective to Martinet, Guillaume, and Benveniste. "All the lines of the affiliation among these 'schools' are not yet clear. But their work came to define the mainstream of linguistics in the twentieth century, and all of it assumes the conception of *langue* set out in the *Cours*" (Joseph 1994:3669).

Within American linguistics the pattern of Saussure's influence may seem less obvious than it does in some European traditions. At least in part, this may stem from the fact that *Cours* was not translated into English until 1959. Even so, Joos (1957:18), in editing a set of papers representing "The Development of Descriptive Linguistics in America" from 1925-1956, could write, "At least half of these authors had read the *Cours*. The others got it second-hand: in an atmosphere so saturated with those ideas, it has been

impossible to escape that. The difference is hard to detect, and it is generally unsafe to accuse a contemporary linguist of not having read the *Cours*” In regard to Joos’s findings, Harris comments, “In other words, by the late 1950s the experience of reading Saussure seems to have been so thoroughly absorbed as to make a distinction between Saussureans and non-Saussureans meaningless” (1987:xiv).

Accounts of communication published in American linguistics prior to the advent of information theory often do demonstrate Saussure’s influence. As Joos suggests, the environment so created affected even those who may not have read Saussure for themselves. Within that age of American linguistics, few scholars had as much longstanding influence as did Edward Sapir and Leonard Bloomfield. Consider here a description of communication by Sapir, who offered the following unmistakably Saussurean statement in his 1921 volume, *Language*:

Communication, which is the very object of speech, is successfully effected only when the hearer’s auditory perceptions are translated into the appropriate and intended flow of imagery or thought or both combined. Hence the cycle of speech, in so far as we may look upon it as a purely external instrument, begins and ends in the realm of sounds. The concordance between the initial auditory imagery and the final auditory perceptions is the social seal or warrant of the successful issue of the process. (Sapir 1921:18)

Bloomfield’s regard for Saussurean principles changed somewhat throughout his career. The first half of his career demonstrates a strong appreciation for Saussurean principles, while that appreciation is less obvious in the later behaviorist period.¹⁵ Accordingly, Bloomfield’s comments regarding communication in *Language* (1933) are less obviously Saussurean than are Sapir’s (1921). Saussure’s influence is nevertheless present. Bloomfield writes:

The reaction mediated by speech can take place in the body of any person who hears the speech; the possibilities of reaction are enormously increased, since different hearers may be capable of a tremendous variety of acts. The gap between the bodies of the speaker and the hearer—the discontinuity of the two nervous systems—is bridged by the sound-waves.

... Man utters many kinds of vocal noise and makes use of the variety: under certain types of stimuli he produces certain vocal sounds, and his fellows, hearing these same sounds, make the appropriate response. To put it briefly, in human speech, different sounds have different meanings. To study this coordination of certain sounds with certain meanings is to study language. ... (Bloomfield 1984:26-27 [orig. 1933]; italics in original)

He later continues:

The particular speech-sounds which people utter under particular stimuli, differ among different groups of men; mankind speaks many languages. A group of people who use the same system of speech-signals is a *speech-community*. Obviously, the value of language depends upon people's using it in the same way. Every member of the social group must upon suitable occasion utter the proper speech-sounds and, when he hears another utter these speech-sounds, must make the proper response. (Bloomfield 1984:29 [orig. 1933])

Elsewhere Bloomfield expounds upon the social function of language:

The persons in a speech community coordinate their actions by means of language. Language bridges the gap between the individual nervous systems: a stimulus acting upon any one person may call out a response action by any other person in the community. Language unites individuals into a social organism. (Bloomfield 1942:173; also see Bloomfield 1984:28 [orig. 1933])

The Saussurean concepts Sapir and Bloomfield support do contribute to development of the code-model view of communication. However, these descriptions are not themselves code-model based accounts. These descriptions provided sufficient metatheoretical content for use by their authors, but they were largely prose descriptions and lacked heuristic qualities that may have given them greater longevity and influence. Sapir and Bloomfield were working only with the first two of the three constituent models described above, the conduit metaphor and Saussure's speech circuit; information theory had not yet made its debut. With the advent of Shannon's theory, information theoretic terminology quickly supplanted that offered by Sapir and Bloomfield, providing the heuristic analogy needed for broad dispersal.¹⁶

3.2.3 Information theory

In 1948 electrical engineer and mathematician Claude E. Shannon published a landmark paper discussing a theory of probability for evaluating the success of electronic transmission of information. Shannon's approach to communication became known as *information theory* (sometimes also called *communication theory*). Shannon and his theory will be discussed in detail below. For now, suffice it to say that his theory provided a heuristic and analogic model for linguistics. It also came to serve as a key component of the model now identified as the code model.

In viewing the problem of communication through the lens of electrical engineering, Shannon was primarily concerned with the mechanics of accurately transmitting and receiving a signal, and with statistical measures which may be used to evaluate the accuracy of that mechanical process. He writes:

The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point. Frequently the messages have *meaning*; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantic aspects of communication are irrelevant to the engineering problem. The significant aspect is that the actual message is one *selected from a set* of possible messages. The system must be designed to operate for each possible selection, not just the one which will actually be chosen since this is unknown at the time of design. (Shannon 1948:379, 1949:3)¹⁷

Shannon's account of a communication system consisted of essentially five parts, which he described as follows:

1. An *information source* which produces a message or a sequence of messages to be communicated to the receiving terminal. ...
2. A transmitter which operates on the message in some way to produce a signal suitable for transmission over the channel. ...
3. The channel is merely the medium used to transmit the signal from transmitter to receiver. ... During transmission, or at one of the terminals, the signal may be perturbed by noise. ...
4. The receiver ordinarily performs the inverse operation of that done by the transmitter, reconstructing the message from the signal. ...

5. The *destination* is the person (or thing) for whom the message is intended. (Shannon 1948:380-381, 1949:4-6)

(These five parts will be discussed in the section 3.2.3.1.) To facilitate discussion of these parts, Shannon provided a diagram, a schematic of sorts, which illustrates the electronic components in generic engineering terms (see figure 3.6). Readers familiar with linguistic literature (or at least section 2.4 of this study) will recognize certain elements of Shannon's description and diagram as having common application in linguistics.

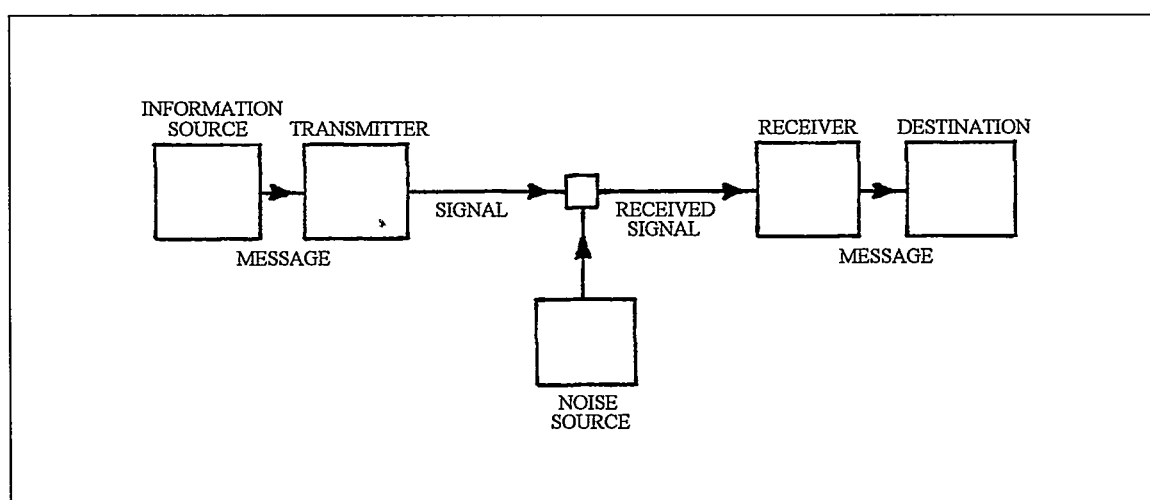


Figure 3.6. Shannon's model of communication, originally presented as a "Schematic diagram of a general communication system" (after Shannon 1948:381, 1949:5).

Within linguistics the information theoretic terminology is typically employed in a code model context. Shannon's model was to provide the terminological and technological framework for development of the code model. However, it is important to distinguish Shannon's theory and the code model. The two are not synonymous. There are certain subtle yet profound distinctions. Nevertheless, the record provided via linguistic literature suggests that the distinction has largely been ignored and overlooked. Many contemporary linguists do not recognize that the two are autonomous.

Particularly among younger linguists and linguistics students, who were not involved in linguistics during the early development of the code model, there is a common misconception that the terminology of the code model has always been the property of linguistics. It is important to note that, except in an occasional and peripheral manner, these terms did *not* occur in the linguistic literature until following the publication of Shannon's paper within electrical engineering. As has been demonstrated, however, the terminology of information theory has become commonplace in linguistics, as well as in psychology and the social sciences generally.

The fact that the terms did not see significant use in linguistics prior to Shannon's paper is surprising, and noteworthy, especially considering that the terminology did indeed have a common usage that predated Shannon's 1948 paper. In addition to its common usage, the terminology had been employed in electrical engineering for some time. For example, R. V. L. Hartley had employed similar terminology and discussion in his 1928 article, "Transmission of Information." As with Shannon's article, Hartley's article was published within the domain of electrical engineering. But, in contrast to Shannon's, Hartley's article did not discover a broad audience outside of its intended discipline.

There are two reasons why, in contrast to Hartley, Shannon found a broad audience. First, Shannon's theory followed World War II and was published at the same time as Norbert Wiener's 1948 bestseller *Cybernetics: Control and Communication in the Animal and the Machine* (to be discussed in section 3.2.3.3). Second, in contrast to Hartley, Shannon had an enthusiastic advocate outside the discipline of engineering: Warren Weaver. Were it not for the Weaver's influence, it is unlikely that Shannon's theory would have had much more impact outside of electrical engineering than did Hartley's.

In July 1949, Weaver, then director for the Natural Sciences in the Rockefeller Foundation, published a tremendously influential review of Shannon's theory in *Scientific American*. In contrast to Shannon (1948, 1949), which was very technical and difficult reading for those unfamiliar with the issues in higher mathematics, Weaver (1949a) was intended for the popular press. While Weaver acknowledged that Shannon's paper specifically applied to telecommunications issues, he nevertheless considered the theory to have "broader significance" and therefore suggested that the general concepts of the theory could be generally extended to human communication. Weaver began by extending the term *communication* well beyond what Shannon had initially proposed: "The word communication, in fact, will be used here in a very broad sense to include all of the procedures by which one *mind* can affect another" (Weaver 1949a:11; italics added).

Later in 1949, following publication of Weaver's article in *Scientific American*, Shannon and Weaver published a joint work titled "The Mathematical Theory of Communication." (Shannon's 1948 paper had been titled "A Mathematical Theory of Communication.") Shannon and Weaver (1949) was not a cooperative effort so much as it was a joint publication. It was composed of two parts: (1) a simple reprint of Shannon's 1948 paper, and (2) an expanded version of Weaver's article.¹⁸ This joint publication was to receive broad distribution and was to greatly influence efforts to apply information theory.

Weaver's contribution was to play a significant role in the way the scientific community received and attempted to apply information theory, particularly since Weaver "adjusted" the theory to better fit established views regarding human communication. His adjustments undoubtedly contributed to the diffusion of the theory and its appropriation by other disciplines, particularly since Weaver readily integrated information theory (as he understood it) with already established concepts of communication, including the conduit

metaphor. (Weaver's contributions and influence will be discussed further in section 3.2.3.2.)

Soon after its introduction within electrical engineering, information theory spread into the fields of psychology, semiotics, and linguistics. While many linguists of the day were well acquainted with the theory and efforts to apply it, it is far less familiar to the current generation. Accordingly, later generations are seldom aware of the requirements of the theory or its relationship to the code model of communication.

Shannon's model was quickly adopted within linguistics. And with Weaver's adjustments as a catalyst, many linguists interpreted key components of the model via the lens of the Saussurian position. Since Weaver had already introduced conduit metaphorisms in his discussion of the theory, within a brief time the coincidence of the three constituent models led to an integration of models, spawning development of the concept here labeled the 'code model'. Since the code model developed in the context of sincere efforts to apply Shannon's information theory, it would be difficult at least, and perhaps even misguided to suggest any single theoretician was responsible for formulating the model. Rather, it is in *misuse* of that theory and Shannon's *model of communication* that we see its development. As has been mentioned, that misuse began with Weaver, in his evoking the conduit metaphor in discussing the information theoretic model. Weaver was closely followed by Charles Hockett and Roman Jakobson, who began to use Weaver's view of the information theoretic model in conjunction with concepts from Saussure's speech circuit model. As has been demonstrated in section 2.4, other linguists were willing to follow their lead in developing what has become the code model of communication.

The fact that information theory and the code model have an independent existence makes a review of the development a bit complex to follow. For example, while Hockett

integrated Shannon's model with Saussure's speech circuit, he did attempt to apply the theory of probability described in information theory to certain problems in phonology and grammar. History records that initially such applications were eagerly received, but they were to be short lived. Following arguments offered by Noam Chomsky, certain elements of Shannon's *theory of probability* were later rejected as an account of human language, particularly as they had been applied by Hockett (see Chomsky 1956, 1957). However, most linguists, including Chomsky and Halle (1968), retained elements of Shannon's *model of communication* for their heuristic, ontological, and metaphoric value.

One may conjecture that most contemporary linguists remain unaware of the source of the information theoretic terminology employed in the code model. This study has found only a very few linguists referencing Shannon (1948) or Shannon and Weaver (1949) as a source underlying their appeals to the code model, and none of those demonstrate awareness that the model being employed is not, in actuality, the model proposed by Shannon. For that reason, a review of Shannon's theory and model of communication is a crucial element in the larger discussion (section 3.2.3.1). That review will be followed by a review of Weaver's contributions and influence (section 3.2.3.2).

3.2.3.1 A brief review of Shannon's theory

As has been mentioned, the first edition of Shannon's paper, "A Mathematical Theory of Communication" (1948), published in *The Bell System Technical Journal*, spelled out ideas for a theory of probability addressing the transmission of information and how the effectiveness of that transmission and reception might be measured. As an electrical engineer, Shannon's primary concern was with the problem of moving information between any two points via electronic media. *The importance of Shannon's perspective and foci of interest cannot be overstated*, for they have a tremendous impact

on how his theory was developed. They are integrally related to the success or failure of his theory once it was extended beyond its initial scope.

Shannon describes the problem of communication as follows (from the second paragraph of his 1948 treatise):

The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point. Frequently the messages have *meaning*; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantic aspects of communication are irrelevant to the engineering problem. The significant aspect is that the actual message is one *selected from a set* of possible messages. The system must be designed to operate for each possible selection, not just the one which will actually be chosen since this is unknown at the time of design. (Shannon 1948:379, 1949:3, italics in original)

Shannon was particularly concerned with the transmission of types of electrical signals and the extent to which disruptions and electrical disturbances, such as electromagnetic static (i.e., electrical *noise*) could impact the system. His scheme consisted of five parts, described via the definitions here quoted:

1. An *information source* which produces a message or a sequence of messages to be communicated to the receiving terminal. The message may be of various types: (a) A sequence of letters as in a telegraph or teletype system; (b) A single function of time $f(t)$ as in radio or telephony; (c) A function of time and other variables as in black and white television—here the message may be thought of as a function $f(x, y, t)$ of two space coordinates and time, the light intensity at point (x, y) and time t on a pickup tube plate; (d) Two or more functions of time, say $f(t), g(t), h(t)$ —this is the case in “three dimensional” sound transmission or if the system is intended to service several individual channels in multiplex; (e) Several functions of several variables—in color television the message consists of three functions $f(x, y, t), g(x, y, t), h(x, y, t)$ defined in a three-dimensional continuum—we may also think of these three functions as components of a vector field defined in the region—similarly, several black and white television sources would produce “messages” consisting of a number of functions of three variables; (f) Various combinations also occur, for example in television with an associated audio channel.

2. A *transmitter* which operates on the message in some way to produce a signal suitable for transmission over the channel. In telephony this operation consists merely of changing sound pressure into a proportional electrical current. In telegraphy we have an encoding operation which produces a sequence of dots, dashes, and spaces on the channel corresponding to the message. In a multiplex PCM system the different speech functions must be

sampled, compressed, quantized and encoded, and finally interleaved properly to construct the signal. Vocoder systems, television and frequency modulation are other examples of complex operations applied to the message to obtain the signal.

3. The *channel* is merely the medium used to transmit the signal from transmitter to receiver. It may be a pair of wires, a coaxial cable, a band of radio frequencies, a beam of light, etc. During transmission, or at one of the terminals, the signal may be perturbed by noise. This is indicated schematically in [figure 3.6] by the noise source acting on the transmitting signal to produce the received signal.

4. The *receiver* ordinarily performs the inverse operation of that done by the transmitter, reconstructing the message from the signal.

5. The *destination* is the person (or thing) for whom the message is intended. (Shannon 1948:380-381, 1949:4-6)

As mentioned above, Shannon also illustrated the components involved with a diagram, a schematic of sorts which generically represented electronic components (see figure 3.6).

Michael Reddy discusses Shannon's theory within his 1979 paper on the conduit metaphor. Reddy was not interested in information theory, but rather with the way in which conduit metaphor expressions had contributed to a misunderstanding of the theory. Reddy's summary of the information theoretic view of the communication problem proves useful:

Information is defined as the ability to make nonrandom selections from some set of alternatives. Communication, which is the transfer of this ability from one place to another, is envisioned as occurring in the following manner. The set of alternatives and a *code* relating these alternatives to physical signals are established, and a copy of each is placed at both the sending and receiving ends of the system. This act creates what is known as an "a priori shared context," a prerequisite [within the theory] for achieving any communication whatsoever. At the transmitting end, a sequence of the alternatives, called the *message*, is chosen for communication at the other end. But this sequence of alternatives is not sent. Rather, the chosen alternatives are related systematically by the code to some form of energy patterns which can travel quickly and retain their shape while they do travel—this is, to the signals.

The whole point of the system is that the alternatives themselves are not mobile, and cannot be sent, whereas the energy patterns, the "signals" are mobile. If all goes well, the signals, when they arrive at the receiving end, are used to duplicate the original selection process and recreate the message. That

is, using the relationships of the code and the copy of the original set of alternatives, the receiving end can make the same selections that were made earlier on the transmitting end when the message was generated. Quantification is possible in this framework only because one can set up measures of how much the received signals narrow down the possible choices of preexistent alternatives.

... the alternatives—the “messages”—are not contained in the signals. If the signals were to arrive at the receiving end, and the set of alternatives was damaged or missing, the proper selections could not be made. The signals have no ability to bring the alternatives with them; they carry no little replica of the message. The whole notion of information as “the power to make selections” rules out the idea that signals *contain* the message. (Reddy 1979:303)

In this summary Reddy attempts to avoid confusing technical jargon. Shannon’s original account was a bit more obscure, as it included several technical definitions and necessary conditions. An accurate application of that theory would require observance of these definitions and conditions. Unfortunately, few linguists seem to have understood the conditions or seen the necessity of Shannon’s tightly constructed definitions. As Reddy notes, attempts to apply the theory outside its original scope “required a very clear understanding, not so much of the mathematics of the theory, but rather of the conceptual foundations of the theory. By and large, these attempts were all accounted to be failures” (Reddy 1979:303-304). Of particular concern are Shannon’s definition of ‘information’ and ‘message’, the associated requirements regarding the message, and his requirements regarding the transmitter, receiver, and the concept of code. These will be addressed in turn.

3.2.3.1.1 Information

From Shannon’s perspective as an engineer and mathematician, the problem of communication was a matter of evaluating *raw* information, that is to say, information of any sort, without concern for how it related to a context, or how it may be used or employed. As such, he required a narrowly circumscribed technical definition of information, which was quite distinct from its common usage.

Undoubtedly, some of the confusion arises from the fact that Shannon never actually *defines* information, rather, he defines how he will measure it:

If the number of messages in the set [of possible messages] is finite then this number or any monotonic function of this number can be regarded as a measure of the information produced when one message is chosen from the set, all choices being equally likely. As was pointed out by Hartley the most natural choice is the logarithmic function. Although this definition must be generalized considerably when we consider the influence of the statistics of the message and when we have a continuous range of messages, we will in all cases use an essentially logarithmic measure. (Shannon 1948:379, 1949:3)

Considering Shannon's initial audience, his neglect in defining 'information' is not surprising. As he states in the introduction to his paper, Shannon depends upon both Nyquist (1921, 1924) and Hartley (1928), both of whom precede him with a similar use of the term. As with Shannon, Nyquist and Hartley provide rather technical definitions which sometimes "muddy the water" for those unfamiliar with their topic. Colin Cherry conveniently summarizes the issues:

In 1924, Nyquist in the United States and Kùpfmùller in Germany simultaneously stated the law that, in order to transmit telegraph signals at a certain given rate, a definite bandwidth is required, a law which was expressed more generally by Hartley in 1928. Hartley showed that in order to transmit a given "quantity of information," a definite product (bandwidth x time) is required. We may illustrate this law in the following way. Suppose we have a gramophone record of speech; this we may regard as a "message." If played in normal speed, the message might take 5 minutes for transmission and its bandwidth might range 100-5000 cycles per second. If the speed of the turntable were doubled, the time would be halved; but also the pitch and hence the bandwidth would be doubled. However, Hartley went further and defined *information* as the successive selection of signs or words from a given list, rejecting all "meaning" as a mere subjective factor (it is the signs we transmit, or physical signals; we do not transmit their "meaning"). He showed that a message of N signs chosen from an "alphabet" or code book of S signs has S^N possibilities and that the "quantity of information" is most reasonably defined as the logarithm, that is, $H=N \log S$. (Cherry 1966: 43-44)

As stated previously, Shannon's theory is a theory of probability. In considering what constitutes 'information', he approaches it from the perspective of probability. Strictly speaking, he cannot know in any absolute sense whether or not the "shape" of an

incoming signal is intentional. He can, however, evaluate the likelihood that the shape of that incoming signal is attributable to chance, which in this context is described as electromagnetic noise. In this situation, the ability to successfully select signs, words, or characters from the message or signal alphabets, is the primary concern. Any meaning associated with those units is irrelevant to the immediate problem.

This understanding of information is also the basis of Shannon's stipulation on monotonic functions. A monotonic function is a function which has "the property either of never increasing or of never decreasing as the independent variable increases" (Mish 1983:769). In common terms, the relationship between function and message must be unwavering if the receiver is to attempt a reconstruction of the message from that function.

The following quotations provide some additional insight into this definition of information:

It doubtless seems queer, when one first meets it, that information is defined as the *logarithm* of the number of choices. (Weaver 1949b:101).

Information is, we must steadily remember, a measure of one's freedom of choice in selecting a message. The greater this freedom of choice, and hence the greater the information, the greater is the uncertainty that the message actually selected is some particular one. Thus greater freedom of choice, greater uncertainty, greater information go hand in hand. (Weaver 1949b:108-109).

Information is defined as the ability to make nonrandom selections from some set of alternatives. (Reddy 1979: 303)

The technical notion of 'information,' as a measure of uncertainty, should be sharply distinguished from the intuitive notion of information, as concerning significance or meaning. A randomly chosen (and hence meaningless) stream of letters will generate more information than a stream of letters composing a meaningful text, since it is far more uncertain (that is, it is far less predictable). (Chater 1994:1685)

Often the messages to be transmitted have meaning: they describe or are related to real or conceivable events. This, however, is not always the case. In transmitting music, for example, the meaning, if there is any, is much subtler than in the case of a verbal message. In some situations the engineer is faced with transmitting a totally meaningless sequence of numbers or letters. In any case, meaning is quite irrelevant to the problem of transmitting the information. (Gallager 1988:569)

Shannon did not attempt to address the nature of any meaningful intention which might have initiated the communication process, nor was he interested in how the structure or semantic aspects of any underlying message might relate to some imagined or real world. His intended audience of electrical and computational engineers seems to have understood this position, but most others seem to have neglected this technical definition, thereby confusing the technical sense of 'information' with its more common usage. Despite distinctions between the information theoretic notion of information and the common notion, which includes meaning, many theoreticians have attempted to apply the theory to semantics (Chater 1994:1687). Even Shannon's colleague Warren Weaver seems to have struggled with the necessary exclusion of semantics. The fact that these efforts have met little success should offer no surprise. As Langacker notes, "One has no guarantee that a seemingly apt metaphor will actually prove appropriate and helpful when pushed beyond the limited observations that initially inspired it" (1991:507). Shannon himself commented upon such misapplications during a 1989 interview. As the interviewer John Horgan records: "Shannon himself doubted whether certain applications of his theory would come to much. 'Somehow people think it can tell you things about meaning,' he once said to me, 'but it can't and wasn't intended to'" (Horgan 1996:207-208). Everett Rogers similarly comments: "Shannon saw information theory as limited to engineering communication and warned the scientific world against applying it more broadly to all types of human communication. Nevertheless, communication scholars have not paid much attention to Shannon's warning" (Rogers 1994:428).

3.2.3.1.2 Message

As may be anticipated, Shannon's restricted definition of 'information' is closely related to his restricted definition of 'message'. He does not elaborate on the technical definition, only stating that "The significant aspect is that the actual message is one

selected from a set of possible messages” (Shannon 1948:379, 1949:3). Shannon’s ability to statistically evaluate the success of a transmission required that the actual message represent a *possible* message. Indeed, without this condition, it would be practically impossible for the transmitter to send a signal which corresponded to that message and statistically impossible for the receiver to “narrow down” the possibilities involved in reconstructing a message from that signal. For example, if a woman wished to send, via a Morse Code-based telegraph, a note to a friend in a distant city, the system could handle either of the first two messages, but not the third:

- (a) the characters “XXXOOO”;¹⁹
- (2) the characters (and spaces) “I LOVE YOU”;
- (3) the shape “♥.”

This is because Morse Code is not designed to recognize the heart shape and relate that shape to a string of “dots and dashes.” But the Morse Code does support signals that correspond to the orthographic conventions of the Roman alphabet. Note that these particular constraints on the set of possible messages might not apply if the woman were to employ a different system of transmission. For example, if she had wished to employ a Facsimile machine, rather than the telegraph, the system could have easily handled any or all of the three messages she suggested. The point here is that each system of communication defines its own set of “possible messages.”

Note, as well, how the meaning the woman may intend through use of these symbols or arrangements of characters is totally irrelevant from the engineering perspective. One or another of the messages may seem more fitting to her, but the system treats the message as raw information; it is only concerned that the message be selected from a set of *possible* messages. This does not mean that the woman is limited to the respective subsets or sequential order of characters reflected in “XXXOOO” and “I LOVE

YOU.” Rather, it means that the message must be assembled from a particular set of components, which in this case would generally be the Roman alphabet and punctuation. A system *may* limit the subset or sequential order of characters in its definition of “possible messages,” but such a requirement would be system specific. In the case of Morse Code, the system will support a potentially infinite arrangement of characters, provided the message is assembled from a restricted set of possible characters. A system might, however, be composed of only one switch, so that a closed circuit represents one message and an open circuit another. From the perspective of information theory, the sort of meaning a reader may associate with such an on-off signal is irrelevant. The system is concerned only with the success or failure of the signal transmission and reception.

It should be evident at this point that Shannon applied a further restriction of the definition of ‘message’, and again his definition conflicts with common usage. Within information theory, the message is *not* the material that is transmitted. Rather, the message is pre-transmission material. Strictly speaking, within information theory, it is completely impossible to “send a message”; one can only send a signal. The following illustrations may help to explain the significance of this definition.

A woman has a message she wants to send to her friend. At the telegraph office she scribbles the message on a piece of paper. The telegraph operator looks at it, then sends it. At station in another city, a second operator receives the message then writes it out. The friend stops by the office later to pick up his message and he is elated. Unfortunately, his dog eats it that night, but no matter; he still savors it for weeks.

In the description provided, the term ‘message’ is used in its common usage. As was discussed in relation to the conduit metaphor, the common usage of ‘message’ involves a significant use metonymy. The following version eliminates that metonymy and highlights the definitions of ‘message’ within information theory as “primary message” and “constructed message.”

A woman has a [mental abstraction] she wants to [share with] her boyfriend. At the telegraph office she scribbles [a primary message, i.e., an arrangement of ink spots] on a piece of paper. The telegraph operator looks at [the ink spots], then sends [a corresponding set of electrical signals]. At a station in another city, a second operator receives the [somewhat distorted, but mostly intact electrical signals] then writes [a constructed message, i.e., a corresponding arrangement of ink spots]. The friend stops by the office later to pick up his [paper bearing the telegraph operator's ink spots, which correspond to a signal received, which to some extent reflects the signal sent, ...] and he is elated. Unfortunately, his dog eats [the paper and ink] that night, but no matter; he still savors [the mental abstraction he generated after observing the telegraph operator's ink spots] for weeks.

From an information theoretic perspective, the semantic intentions of the woman are *irrelevant*. The transmitter and receiver are only concerned with how the constructed message may be related to the set of possible primary messages (in this case the set of characters composing the English alphabet) and the signal alphabet (in this case the set dots and dashes defined by Morse Code).

For readers not directly concerned with the information theoretic perspective on communication, this distinction between message and signal may seem superfluous—a “quibble over semantics.” Indeed, most linguists have handled it so, as the code model quotations presented in section 2.4 illustrate. This practice has reflected a grave misunderstanding, for as will be seen, it is a very significant distinction. Indeed, this misunderstanding and/or disregard for this distinction has been one of the major factors contributing to the integration of the conduit metaphor with Shannon's information theory.

3.2.3.1.3 Transmitter and receiver

Shannon specifies that, in addition to having a well established definition of acceptable messages, “The system must be designed to operate for each possible selection, not just the one which will actually be chosen since this is unknown at the time of design” (Shannon 1948:379, 1949:3). This may apply to previously undefined strings of characters

or to already defined strings of characters. If a single message or fixed arrangements of characters were to be accepted as possible messages, then the signal need not correspond to the respective characters in those messages, but only to the respective fixed arrangements as wholes. Weaver addresses such a situation in discussing the fact that information does not concern semantics:

The concept of information applies not to the individual messages (as the concept of meaning would), but rather to the situation as a whole, the unit information indicating that in this situation one has an amount of freedom of choice, in selecting a message, which it is convenient to regard as a standard or unit amount.

The two messages between which one must choose, in such a selection, can be anything one likes. One might be the text of the King James Version of the Bible, and the other might be "Yes." The transmitter might code these two messages so that "zero" is the signal for the first, and "one" the signal for the second; or so that a closed circuit (current flowing) is the signal for the first, and an open circuit (no current flowing) the signal for the second. Thus the two positions, closed and open, of a simple relay, might correspond to the two messages. (Weaver 1949b:100)

Obviously, Shannon's theory requires that the transmitter and receiver both be capable of handling the message. In describing the components in the communication process, Shannon termed it so:

A *transmitter* which operates on the message in some way to produce a signal suitable for transmission over the channel. ...

The *receiver* ordinarily performs the inverse operation of that done by the transmitter, reconstructing the message from the signal. (Shannon 1948:381, 1949:6)

If the transmitter and receiver cannot equally handle the message, then the receiver has no means of *confidently* assessing the resemblance between the original and constructed messages. Shannon's theory is ultimately a theory of probability, and probability depends upon the ability to statistically measure the likelihood of an event's being attributable to chance. This is why information, in this context, is sometimes defined as "a measure of uncertainty" (Chater 1994:1685) or as "the ability to make

nonrandom selections from some set of alternatives' (Reddy 1979). The ability of the transmitter and receiver to operate effectively together (i.e., for the transmitter to successfully read a primary message and transmit a corresponding signal, and for the receiver to successfully receive that signal and construct a message closely corresponding to that handled by the transmitter) fundamentally depends upon the transmitter and receiver having identical copies of the code.

3.2.3.1.4 Code

As has been presented, there has been great confusion regarding the concepts of information and message. It should come as no surprise that there is also confusion regarding the concept of code. As Wales recounts, the term "is so widely used in other fields, linguistic and literary, that it is in danger of becoming a mere synonym for language, variety, or dialect" (1994:577). In the context of information theory, the idea is quite distinct from any of these uses. The problem again stems from distinctions between the technical and common uses of the word.

In the common definition of the term, the code is considered to be "a set of signals for sending messages" (Neufeldt 1989:84). In this common definition, the "set of signals" is an alphabet, albeit one devised of potentially mobile components, such as electrons or wave energy. As has been discussed, however, such a definition will not hold for information theory, for in the context of that theory the message is not *sent* anywhere.

What then is the code as defined in information theory? In information theory the code is *not* an alphabet, but rather an algorithm, a "systematic method of solving a certain kind of mathematical problem" (Neufeldt 1989:11). In the context of communication systems that "problem" is the relationship between the two alphabets, the message alphabet and the signal alphabet. The code, then, is the algorithm that defines the relationship between the two alphabets. The actual signals selected must thereby be

selected from a set of possible signals, just as the actual message must be selected from a set of possible messages.

The set of possible signals is constrained both by mechanical potential and practical constraints on the system. The mechanical capabilities of the transmitter and receiver are the primary concern. Obviously, it would be impossible for the set of possible signals to include a signal that the system was incapable of transmitting. For practical reasons, such as maximal contrast, systems typically employ only a subset of the total possible signals. This subset may be spoken of as the repertoire of signal characters (Reddy 1979).

In speaking of the information theoretic definition of 'message', it is important to differentiate the primary message from the constructed message. By definition, these messages are not mobile, while the signal *is* mobile. If the primary message is to be subjected to the communication process, then the system must "read" that message and, in response, assemble a corresponding set of "characters" selected from the signal alphabet. The transmitter employs the code in determining what subset of the signal-alphabet characters it will include in the signal to be sent. Similarly, the receiver employs the code in determining what subset of message-alphabet characters it will include in the constructed message.

As mentioned, the technical definition of code (as algorithm) is sometimes entangled with the common definition (as a set of signals for sending messages). For example, Wales writes, "One way of looking at a code is to see it as a sign system (primary code) that can be used to convert messages into another (secondary code). So, verbal language is the basis of Morse Code" (1994:577). Wales is quite correct in pointing out the existence of two systems (i.e., the message alphabet and the signal alphabet), but unfortunately confuses the issue in referring to the alphabets as codes. Additional

confusion arises from the fact that, strictly speaking, in using the example of Morse Code, she refers to a code designed to handle messages composed of characters from the Roman alphabet, rather than messages "written" in verbal language. (The confusion is further compounded by the metonymy involved; in common language the term "Morse Code" is typically used in referring to *both* the algorithm and the signal alphabet.)

The issue of code and message provides another distinction as defined within information theory: *while the constructed message is directly related to the code handled by the receiver, the original message is not necessarily so related to the code handled by the transmitter.* In Shannon's model this distinction occurs in isolation of the information source and the transmitter. This is an important distinction, for in contrast to a strict information theoretic perspective, the code-model view of communication typically *combines* information source and transmitter into one unit, the 'encoder'. As stated, an awareness of the set of possible messages may constrain the types of messages that are assembled, but the code itself is not employed in construction of the primary message. In the example scenario provided earlier, the telegraphic system may constrain the type of signal the woman is able to effectively "send," but the code itself is not involved in the message construction. The telegraph operator does not read the message for content, evaluating whether or not it is a good love letter or whether it's adequately expresses the woman's thoughts. He simply accepts, or rejects, the characters she provides, based upon their compatibility with the code requirements.

As is seen in Wale's (1994:577) comment quoted previously, to some extent the telegraphy example hinders explanation of this process, for in the example a separate "coding" event actually precedes the written message. Describing the process of human speech production in terms of the Shannon's model of communication, one might say that the woman had a thought (a semantic concept) in mind. In relation to that thought, she

produced a primary message (an organized assemblage, i.e., a "text"). That message was then processed via a code and a signal was assembled that corresponds, within the limitations of the system, to her original message. That signal is typically composed of one or a combination of the following:

- (a) coordinated movements of the vocal articulators and diaphragm (in turn producing the movement of air and resulting sound waves, including pitch and intonation);
- (b) coordinated movements of the hands and fingers as they hold a writing instrument, manipulate a keyboard, or articulate a signed language;
- (c) gestures and body movements, including facial postures and eye movements.

The primary message (text) is related to the vocal or dextral movements via a code, but that code was not involved in the assembly of that message. This is not to say that an awareness of the coding possibilities did not factor into the assemblage. *Rather, it is to point out that the construction of the primary message and the construction of the signal are separate events.* The system is *not* responsible for assembling the primary message. Neither is the system responsible for defining a relationship (if there is one) between the primary message and the semantic concepts conceived by the speaker. The system is, however, responsible for assembling the constructed message (also a text), and it does employ the code in that process. The system is not, however, responsible for defining a relationship between the constructed message and any semantic concepts conceived by the hearer.

With this explanation in view, it should be clear that there is one area (and only one area) in which the model of communication proposed in Shannon (1948, 1949) can be legitimately applied to human oral communication: phonetics its relationship to phonology. The transmitter handles articulation and the receiver handles auditory reception. Shannon's theory would then be concerned with the accuracy to which the

speaker can “read” an articulatory-text (that is, a string of phonemes) and transmit a sequence of sound waves, which, in turn, the receiver can hear and “write” (i.e., construct) a corresponding acoustic-text (also a string of phonemes).

As has been addressed, it is a condition of Shannon’s theory that the transmitter and receiver have the same code. In the case of human articulatory and acoustic organs, it is the case that healthy, normal human bodies do, indeed, share the same code; a healthy human can accurately hear any articulation produced by a healthy fellow human. But this says nothing about the patterned *arrangements* of soundwaves (i.e., the language of the speaker), nor does it say anything about *semantic intention* of the speaker or the *semantic perceptions* of the hearer (i.e., meaning). Shannon’s theory does not address these. This is an important distinction that has been historically neglected by linguists. Undoubtedly the interference posed by Saussure’s speech circuit contributes to that oversight. (The integration of the Saussurean speech circuit with information theory will be addressed in section 3.3.3.)

3.2.3.2 A brief review of Weaver’s contributions

As has been addressed, in 1949 Shannon’s (1948) paper was republished in conjunction with an expansion of the theory provided by Warren Weaver. Shannon’s treatise was altered only slightly, but bound together with Weaver’s paper, it was to have a significant impact, not just within electrical engineering, but in other disciplines as well, including the social sciences (see Pollack 1968).

Weaver made several significant contributions, including the identification and delimitation of three levels of communication problems. He lists the levels as follows:

LEVEL A. How accurately can the symbols of communication be transmitted?
(The technical problem.)

LEVEL B. How precisely do the transmitted symbols convey the desired meaning?
(The semantic problem.)

LEVEL C. How effectively does the received meaning affect conduct in the desired way? (The effectiveness problem.) (Weaver 1949b:96)

The addition of levels 'B' and 'C' was to have a somewhat ambiguous impact on the effectiveness and perceived usefulness of Shannon's theory. As stated previously, in its initial form, Shannon's theory was not intended to account for meaning in any way. Of course Shannon recognized that messages may be used in a meaningful way, but he had avoided the semantic and effectiveness problems which Weaver now highlighted. Weaver himself avoided attempting to explicitly account for elements other than those involved in Level A, the "technical problem," but he nevertheless suggested the need for work on other levels. Unfortunately, in his zeal to see information theory applied to human communication he failed to identify these areas as being outside the scope of information theory. For example, he writes:

Thus when one moves to levels B and C, it may prove to be essential to take account of the statistical characteristics of the destination. One can imagine, as an addition to the diagram, another box labeled "Semantic Receiver" interposed between the engineering receiver (which changes signals to messages) and the destination. This semantic receiver subjects the message to a second decoding, the demand on this one being that it must match the statistical semantic characteristics of the message to the statistical semantic capacities of the totality of receivers, or that subset of receivers which constitute the audience one wishes to affect. (Shannon and Weaver 1949b:115)

Weaver also made a comparison essential to the development of the code model, a comparison Shannon seems to have avoided: "In oral speech, the information source is the brain, the transmitter is the voice mechanism producing the varying sound pressure (the signal) which is transmitted through the air (the channel)" (Weaver 1949b:98). While Weaver's description is not necessarily problematic, it has been easily misread, particularly since in referring to the brain as information source he doesn't isolate the roles the brain performs. (The brain handles the meaning and pattern qualities of the message as well as the articulatory qualities. Shannon's theory, however, only accounts for the articulatory/acoustic process.)

In addition to these adjustments, Weaver introduced several conduit metaphors in the discussion, thereby multiplying the metonymy and semantic pathology already inherent in the Shannon's choice of terminology.²⁰ (The integration of conduit metaphors with information theory will be addressed in section 3.3.2.)

Unfortunately, many communication scholars have failed to differentiate Weaver's suggestions from the theory proposed by Shannon. Quoting Ritchie (1986), Rogers writes:

One source of confusion on the part of communication scholars is "the habit of citing 'Shannon and Weaver' when it is Weaver's speculations that are being quoted, under the assumption that they are somehow supported by Shannon's mathematics." When the Shannon and Weaver book is cited by communication scholars, they are usually referencing ideas from Weaver's part ... rather than from Shannon's part (Rogers 1994:425, n. †)

3.2.3.3 The diffusion of information theory into linguistics

While Shannon's model obviously had some "first" point of introduction into linguistics, the fact that his model and information theory were so broadly employed in other disciplines helped to insure that *multiple* points of entry were established.²¹ Nevertheless, it is useful to note some of the early introductions.²²

The social and intellectual atmosphere of the day seemed to have greatly influenced the reception offered to Shannon and his theory. Having just come through World War II, many in the scientific community were intensely interested in overcoming the perceived chaos stemming from that conflict. Many scientists turned their energies toward providing systematic and mathematical explanations for social and communicative phenomenon. Information theory provided something of an answer to their question, for in addition to its obvious applications in the fields of electrical and computational engineering, the theory initially seemed to offer great promise as a tool for analyzing the social effects of communication.

Within this historical context, Norbert Wiener, a mathematician at the Massachusetts Institute of Technology, proposed a theory which, at the time, seemed to offer the hoped for explanation. Wiener called his theory "Cybernetics," publishing in a book by the same name, subtitled *Control and Communication in the Animal and the Machine*. The book was published in 1948, the same year as the publication of Shannon's initial article, "A Mathematical Theory of Communication."²³

Cybernetics was to provide a broad context in which Shannon's information theory could be viewed, and interest in cybernetics was to play an important role in the diffusion of information theory into linguistics. For example, Charles Hockett writes the following concerning his early review of information theory which appeared in *Language* (1953):

In 1948, Norbert Wiener's "cybernetics" burst forth on the postwar intellectual scene, and Claude Shannon's information theory made its more subdued entrance. These struck me as genuinely new and as important. There had to be implications for linguistics and anthropology, and I set out to discover what they were. When I found enough to warrant writing this [1953] review, I wrote it. Subsequently I found more—indeed, the information-theoretical approach became part of my standard intellectual equipment, fitted neatly into the physicalist frame of reference ... (Hockett 1977:19)

While Hockett's review was one of the more visible introduction points for information theory, it was not the first. For example, Oliver Straus, of the Research Laboratory of Electronics at the Massachusetts Institute of Technology, had already published a brief article on "The Relation of Phonetics and Linguistics to Communication Theory" (Straus 1950). It appears, however, that Straus' paper went largely unnoticed by the community of linguists (Dahling 1962:130).²⁴ George Miller and J. A. Selfridge also published on certain applications of information theory in psycholinguistics in 1950. In contrast to Straus' paper, Miller and Selfridge (1950) was cited in several later linguistic publications (Dahling 1962:130). In a footnote within his original (1953) review, Hockett

himself mentions several early references to the information theory that occurred within linguistics prior to his own review:

References to information theory have already appeared in linguistics discussions: J. Whatmough, presidential address before the Linguistics Society, December 1951; C. F. Hockett, *Language* 27.337, 445 (1951); R. Jakobson, C. G. M. Fant, and M. Halle, *Preliminaries to Speech Analysis*, Technical Report No. 13 (January and May 1952) of the Acoustics Laboratory, MIT. (Hockett 1953:70, n. 2)²⁵

In a comment which would seem to have foreshadowed the future (now history) of information theory within linguistics, Hockett also wrote, "It is not certain that all of these references are based on adequate understanding of the theory" (Hockett 1953:70, n. 2; italics added).

Many linguists of the current generation are unaware of the significance cybernetics and information theory had within their historical context. Accordingly, they easily miss the role these theories played in the development of contemporary linguistics. John Horgan provides some useful background material concerning the spread of Cybernetics and information theory:

Cybernetics was created largely by one person, Norbert Wiener He proclaimed that it should be possible to create a single, overarching theory that could explain the operation not only of machines but also of all biological phenomena, from single-celled organisms up through the economies of nation-states. All these entities process and act on information; they all employ such mechanisms as positive and negative feedback and filters to distinguish signals from noise.

... Closely related to cybernetics is information theory, which [was developed by] Claude Shannon, Shannon's great achievement was to invent a mathematical definition of information based on the concept of entropy in thermodynamics. Unlike cybernetics, information theory continues to thrive—within the niche for which it was intended. Shannon's theory was designed to improve the transmission of information over a telephone or telegraph line subject to electrical interference, or noise. The theory still serves as the theoretical foundation for coding, compression, encryption, and other aspects of information processing.

By the 1960s information theory had infected other disciplines outside communications, including linguistics, psychology, economics, biology, and even the arts. (Horgan 1996:207-208)

In contrast to Shannon's theory, which only proposed to handle the transmission of information, Wiener's theory purported to explain the way in which information was used in *purposeful control*. "In this sense, cybernetics may be regarded as the study of information handling" (Bothamley 1993:132).

In addition to cybernetics and the mathematical study of social situations, much postwar research was poured into the idea of machine translation. Shannon's theory seemed to offer great potential in that area of study. Several key players in the code model drama seem to have come upon the theory by that course. Noam Chomsky, whose *Syntactic Structures* strongly reflects the influence of information theoretic constraints, alludes to the impetus of such projects in comments regarding the machine translation project headed by Victor Yngve:

What happened is that [Victor] Yngve's project was continually hiring very good linguists, I'd made clear even before I was appointed that I didn't think the project made any sense. Others (Lees, Matthews, Lukoff ...) had varying views about the matter, and did work on aspects of it. But gradually they all reached the same conclusion, and began to concentrate more and more on straight linguistics, then in a real ferment at MIT. Yngve wasn't happy about it: he was dedicated to machine translation. (Chomsky in personal communication to Barsky; Barsky 1997: 90; brackets and ellipsis in original)

Shannon's information theory was also quickly adopted into behavioral psychology, which at the time had a strong relationship to linguistics. Pollack notes, "Shannon's development ... was enthusiastically grasped very early by a handful of psychologists, primarily those associated with the Psycho-Acoustics Laboratory at Harvard University" (Pollack 1968:333). Psychologist George A. Miller recounts that "initial enthusiasm was stirred by the realization that Shannon had provided a tool for describing discrete events that at the same time was compatible with the continuous Fourier analysis of communication systems, with which the group was already acquainted" (Miller in personal communication to Pollack; Pollack 1968:333).

(Chomsky's position as published in *Syntactic Structures* was to influence Miller such that he modified his early views regarding human language and information theory; see Miller 1964, n. 1, Miller and Chomsky 1963.)

Miller also recounts some of his early exposure to linguistics, which occurred in the context of a series of work conferences on selected research problems (see Sebeok 1960:1). In his closing statement offered at one of the conferences held in 1958, Miller offers some interesting insight on the role these conferences played in the diffusion of information theory (and, ultimately, in the development of the code model). He comments:

Several times during this conference I had occasion to remember another conference held at the Massachusetts Institute of Technology about ten years ago, when Mr. Locke had the happy notion that it would be good to get people together to talk about speech, language, and communication. So he began the conferences on speech analysis, which were attended by communication engineers, mathematicians, psychologists, and linguists. ... The linguists talked about some mystic entity called the "phoneme," an abstraction that had never been seen on the face of oscilloscope. ... The engineers had a fantastic idea that they could measure information, but the probabilities and logarithms involved made it certain that nobody really understood what they were saying. And the psychologists kept insisting that the important thing was the perception of speech, which did not impress anybody but the psychologists. ... Those conferences continued, however, and eventually we managed to educate each other. I can now talk about information theory, and the phoneme does not frighten me quite the way it did. Roman Jakobson will now use words like "source" and "receiver" and "message" and "code." And many engineers are now deeply worried about the acoustic basis of phonemes and speech perception. (Miller 1960:386-387)

While a few linguists did attempt to employ the theory of probability Shannon proposed (for example, see Hockett 1955), most adopted the model only for analogic purposes, giving considerably less attention to the theory it addressed (see Pollack 1968). By the mid-1960s Shannon's original theory had undergone certain modifications that contributed to such use. The most significant of these was the substitution of the terms encoder and decoder for Shannon's earlier transmitter and receiver. The notion of

encoding and decoding had been employed in Shannon's initial paper, but were used in reference to *processes*, rather than mechanical *components*. For the purposes of linguists employing early versions of the code model, the change in terminology was convenient; encoder and decoder were more easily personified than were the earlier transmitter and receiver, terms that spoke too clearly of their technical origins. In the process, Shannon's essential distinctions between the information source and transmitter and the receiver and destination were neglected. Contemporary linguistic appeals to the model invariably use the adjusted terminology.

Having been adopted by linguists, Shannon's characterization of communication began to serve the role of a *true model*. This is an important distinction, for Shannon had not offered a model, *per se*. In his graphic representation of the model, for example, he had offered a diagram, a schematic, and discussed the workings of actual electronic apparatus. For his purposes, he could have drawn pictures of telegraphic keypads, wires, and receivers, or even used a photograph, for that matter. A generic diagram simply allowed him to address several types of apparatus with a single illustration.

In contrast to how they were used in engineering, within linguistics Shannon's drawing and explanation were being used as an *analogy*, modeling a complex real world process. As addressed in chapter 2, models depend upon generalization; they can represent only a portion of the character of the real world phenomenon they are used to describe. When such models are based upon an analogy, the strength of this characterization is further limited by the quality of the comparison made. Shannon had recognized human communication to be a complex process, but for his purposes had factored out elements which were not pertinent to his study of electronic transmission and reception. Linguists adopting Shannon's description without its associated theory were, at best, inadvertently subjecting the problem of human communication to reductionism.

3.3 Integrating the constituent models

Chapter 2 cited a selection of appeals to the code model. This section addresses the integration of the three constituent models by documenting several types of appeals: (1) quotations which inadvertently appeal to two of the constituent models in addressing a single issue, (2) quotations which address one of the constituent models while employing terminology from another, and (3) quotations which purport to discuss one or another of the constituent models, but do so via an appeal to the code model. Each of these types of appeal demonstrate willingness to fuse the models. In addition, some appeals demonstrate a naivete regarding the distinctive qualities of the constituent models. This does not mean, however, that all of the theoreticians quoted are even aware that they *are* appealing to multiple models.

3.3.1 Saussure's speech circuit and the conduit metaphor

It should be clear at this point in the discussion that Saussure employed a translation model in developing the speech circuit model of communication. In addition to its being a translation model, Harris notes that it is also a *transmission* model. Accordingly, it borrows apparent plausibility from the conduit metaphor. Harris writes:

The first point to note is that the speech-circuit model is a transmission model. It represents communication as involving passage through a succession of phases arranged in linear progression along a track or pathway. In this succession there are no gaps. The process is envisaged as a continuous journey or transfer of information from one point in space to another point in space: that is, from a location in B's brain or, in the reverse direction, from B's brain to A's. Now a model of this kind undoubtedly receives much support from numerous expressions used in everyday speech to describe the processes of communication. For example, ideas are said to be *put into* words; words are *exchanged*; verbal messages are *put across* or *got over*, *sent* or *passed on*; and eventually *received* and *taken in*. This way of talking about communication as transmission has been described as 'the conduit metaphor' (Reddy 1979), and it is a metaphor with extensive ramifications in various European languages. The influence of this metaphor in predisposing us to accept any transmission model of speech as plain 'common sense' is not to be underestimated. (Harris 1987:213-214; underscore added)

It is interesting to note that Locke, upon whom Saussure relies, actually employed the term *conduit* in describing communication. He also extends the basic conduit metaphor, speaking of an “ill use of language” as a breaking or stopping of “the pipes.” Locke writes:

For Language being the great Conduit, whereby Men convey their Discoveries, Reasonings and Knowledge, from one to another, he that makes an ill use of it, though he does not corrupt the Fountains of Knowledge, which are in Things themselves; yet he does, as much as in him lies, break or stop the Pipes, whereby it is distributed to the publick use and advantage of Mankind. (Locke 1975:Book III, Chapter 11, Section 5; italics added)

3.3.2 The conduit metaphor and information theory

Before addressing the integration of the conduit metaphor and information theory within the code model, it is important to note that information theory is *in no way* an extension of the conduit metaphor, nor vice versa. As addressed in section 3.2, the literature occasionally supports some confusion regarding this issue (e.g., Berge 1994:614). No doubt, this confusion stems from the fact that Reddy’s landmark article on the conduit metaphor also discusses information theory (Reddy 1979:302-306). It is important to read Reddy’s discussion carefully, however, for in no way does he suggest that information theory is derived from the conduit metaphor. Rather, he is addressing the inclusion of conduit metaphorisms in Shannon and Weaver (1949). As Reddy concurs, when properly understood, the conduit metaphor and information theory do not support agreement, but rather a *conflict* in perspective. Via integration, the two find a relationship in the code model; but nevertheless, there is *disparity* between the conduit metaphor and information theory themselves, rather than a dependency.

Although Reddy discusses information theory, he is not concerned with information theory, *per se*; he simply finds information theory a particularly useful

example of the way in which conduit metaphorisms can hinder effective understanding of a theory. He writes:

Indeed, the most convincing documentation [of the subtle pressure of the conduit metaphor] one could wish for is to be found in the historical development of *mathematical information theory*. For here, if ever, with both a concept-free algebra of information, and working machines to use as models, the effect of the conduit metaphor should have been avoided. But, in fact, it was not. And the conceptual basis of the new mathematics, though not the mathematics itself, has been completely obscured by the semantic pathologies of the conduit metaphor. (Reddy 1979:302)

Of primary concern for Reddy is the way in which the conduit metaphor introduces “semantic pathology” into discussions of information theory, and thereby into applications of that theory. Reddy borrows “semantic pathology” from Stephen Ullman, who explains that it arises “whenever two or more incompatible senses capable of figuring meaningfully in the same context develop around the same name” (Ullman 1957:122, in Reddy 1979:299). To illustrate such pathology, Reddy offers example sentences employing two senses of the word “poem,” which he distinguishes in notation as POEM1 and POEM2. POEM1 refers to poems as written texts and POEM2 refers to poems as mental abstractions:

POEM1:

- (a) The poem was almost illegible.
- (b) The poem has five lines and forty words.
- (c) The poem is unrhymed.

Reddy suggests that examples (a) through (c) refer to a written text (1979:299). Examples (d) through (f), however, are a bit more ambiguous, suggesting an underlying abstraction (1979:300).

POEM2:

- (d) Donne’s poem is very logical.

(e) That poem was so completely depressing.

(f) You know his poem is too obscene for children.

Of these, Reddy writes, "The most probable referent of the word is not the text, but rather the concepts and emotions assembled in the reading of the text" (Reddy 1979:300). Reddy then offers an additional example (g), demonstrating a semantic pathology in which "poem" can be easily read as *either* POEM1 or POEM2.

POEM1 OR POEM2:

(g) Martha's poem is so sloppy!

Poems are certainly not the only items that are conceptually and expressively handled in this way. Concerning such semantic pathology, Reddy writes:

It is easy to see that this ambiguity of the term "poem" is intimately related to the conduit metaphor. If the words in language contain the ideas, then POEM1 contains POEM2, and metonymy, a process of meaning extension second in importance to metaphor, takes over. That is, when two entities are always found together in our experience, the name of one of them—usually the more concrete—will develop a new sense which refers to the other. Just as ROSE1 (= the blossom) developed ROSE2 (= the shade of pinkish red) by metonymy, so POEM1 gave rise to POEM2. For, in terms of the conduit metaphor, the two are seen as existing together, the second *within* the first, and all the conditions of metonymy are met. (Reddy 1979:300; italics added)

Within information theory, a similar semantic pathology is demonstrated in the terms employed, both by the theoreticians who developed the theory and by others, particularly linguists. This is especially noteworthy concerning some uses of the term "message," which, like "poem," can be identified as MESSAGE1 and MESSAGE2. The first is in reference to the signal sent by the transmitter, while the second is used in reference to pre-transmission material. As addressed previously, this occurs in Shannon's 1948 paper (and the 1949 reprint) primarily in his decision to use common terminology (e.g., *information, message*), even though he was using the terms in technical senses that did not closely follow the common usage. In Weaver, however, the threat posed by the

conduit metaphorisms are more subtle and more problematic (Reddy 1979:304-305). For example, Weaver writes, "The *transmitter* changes this *message* into the *signal* ..." (Weaver 1949b:98; italics in original).²⁶ Concerning this issue, Reddy writes:

If [Shannon and Weaver] did not [recognize the ambiguity and semantic pathology inherent in their terminology], I believe it is because their thought processes were responding to the biasing effect of the conduit metaphor. Weaver, it seems, could not hold the theory clearly in mind when he spoke of human communication, and used conduit metaphor expressions almost constantly. "How precisely," he asked, "do the transmitted symbols *convey* the desired meaning?" (p.4) Or he compared two "messages, one of which is *heavily loaded with meaning* and the other of which is pure nonsense." (p.8) In truth, it seems that he still thought of the MESSAGE2, the repertoire members, as being sent across the channel, even though this destroys the notion of information as selective power. Weaver hedges significantly when he describes the action of the transmitter. It "changes," he says, "the *message* into the *signal* [italics Weaver's]." (p.7) Really, this is a strange description. A code is a relationship between two distinct systems. It does not "change" anything into anything else. It merely preserves in the second system the pattern of organization present in the first system. Marks or sounds are not transmuted into electronic pulses. Nor are thoughts and emotions magically metamorphosed into words. Again, this is conduit-metaphor thinking. There is no justification whatsoever in information theory for talking about communication this way.

It is worth noting that Shannon, who actually originated the mathematics, may have had a more coherent understanding than Weaver. At some points in his own exposition, Shannon used exactly the right ordinary language terms. He wrote, "The *receiver* ordinarily performs the inverse operation of that done by the transmitter, reconstructing the message from the signal" (p.34). But it still does not seem that he perceived the damage done to the paradigm by his own and Weaver's conduit metaphorisms. (Reddy 1979:305; italics Reddy's except where otherwise noted)

It is interesting to note that Reddy quotes Shannon and Weaver (1949) from the second edition, which reverses the order of the two articles so that Weaver's article occurs first. Of course that change affected the pagination of the two articles. If that were the only effect generated by the change, it would be insignificant. It is likely, however, that the change was indeed significant. With Weaver's article coming first in the book, that article served as an *introduction* to information theory, shaping reader's understanding

accordingly. The first edition, which placed Shannon's article first, more accurately placed Weaver's article in the position and role of a *commentary*.

Reddy notes that a similar problem occurs in information theoretic terminology that has been developed subsequent to Shannon (1948) and Shannon and Weaver (1949). Certain of these terms misrepresent information theory, all the while supporting the conduit metaphor quite well. For example, the terms "encode," "decode," and "information content" all suggest that the message has somehow been *inserted* into the signal. As Reddy reminds his readers, "Signals *do something*. They cannot *contain anything*" (Reddy 1979:306).

3.3.3 Information theory and Saussure's speech circuit

As mentioned previously, the fact that Saussure cast his model of communication in electromechanical terminology, as a circuit model, undoubtedly contributed to its later integration with the electrical engineering model offered in information theory. Harris comments:

Modern technology is deeply committed to circuit models. Without them, it is no exaggeration to say, technology as the modern world knows it could scarcely exist. ... Bearing this in mind, it is not a naïve question to ask why Saussure (unlike Locke) insisted that speech involved a *circuit*; and whether as a matter of fact *circuit* was an appropriate term to choose. (Harris 1987:213)

Saussure himself employs the term code in discussing the *langue*. Harris translates:

Speech ... is an individual act of the will and the intelligence, in which one must distinguish: (1) the combination through which the speaker uses the *code* provided by the language in order to express his own thought, and (2) the psycho-physical mechanism which enables him to externalise these combinations. (Saussure 1983:[30-31]; italics added)

Accordingly, if a contemporary theoretician employs the term code alone, without employing associated code model terms (e.g., encode, decode, message, transmission),

that does not necessarily indicate an appeal to the code model. This is particularly so if the point of discussion is Saussure's theory. For example, Koerner writes:

At the core of Saussure's linguistic theory is the assumption that language is a system of interrelated terms which he called 'langue' (in contradistinction to 'parole,' the individual speech act or speaking in general). This 'langue' is the underlying *code* which ensures that people can speak and understand each other; it has social underpinning and is an operative system embedded in the brain of everyone who has learned a given language. The analysis of this system, Saussure maintains, is the true object of linguistics. (Koerner 1994:3663; italics added)

When theoreticians employ multiple examples of information theoretic terminology, however, the collective choice of terminology indicates at least a limited appeal to the code model. For example, consider the following quotation from Hartmann and Stork (1972). Having defined *langue* and *parole*, they then paraphrase their definitions via an appeal to information theoretic terminology:

Language may be said to have two facets: *Langue* refers to the system of language which is passed on from one generation to another, e.g. the grammar, syntax and vocabulary, whereas *parole* refers to all that which a speaker might say or understand. *Langue* is the social, conventional side of language; *parole* is individual speech. Another way of expressing the difference is to say that *langue* is the code and *parole* is the message. (Hartmann and Stork 1972:126; underscore added)

While readers may rightly disagree with Hartmann and Stork's paraphrasing *langue* and *parole* as code and message, the fact that they elect to use such a characterization demonstrates their willingness to fuse these constituent models.

One of the more common theoretical areas where Saussure's speech circuit is integrated with information theory is in discussion of semiotics. In fact, it is so common in this domain that some theoreticians even call the code model account the semiological perspective (e.g., Givón 1989:81). Semiotics is, of course, a direct outgrowth of Saussurean semiology:

Saussure's emphasis on language as 'a system of (arbitrary) signs' and his proposal that linguistics is the central part of an overall science of sign relations

or 'sémiologie' have led to the development of a field of inquiry more frequently called 'semiotics' (following C. S. Peirce's terminology), which deals with sign systems in literature and other forms of art, including music and architecture. (Koerner 1994:3663)

For many linguists, most of whom were not well acquainted with the details of Shannon's theory, Shannon's model seemed to fit well with the Saussurean view concerning language and the sign-meaning relationship. Languages were considered comparable to Shannon's *codes* and the model's mechanical conversion of a message into an electronic signal seemed to fit well with the classical semiotic notion of signs.

While John Lyons does seem to have understood information theory better than many others, he nevertheless offers a classic example demonstrating how these constituents are integrated (see Lyons 1977, esp. page 36). In a discussion titled "The Semiotic Point of View" in his *Language and Linguistics* (1981), Lyons introduces the semiotic tradition, then casts semiotics in information-theoretic terminology:

Semiotics has been variously described: as the science of signs, of symbolic behaviour or of communication-systems. ... For present purposes, we will think of semiotics as having to do with communication-systems; ... There are certain concepts relevant to the investigation of all communication-systems, human and non-human, natural and artificial. A signal is transmitted from a sender to a receiver (or group of receivers) along a channel of communication. The signal will have a particular form and will convey a particular meaning (or message). The connection between the form of the signal and its meaning is established by what (in a rather general sense of the term) is commonly referred to in semiotics as the code: the message is encoded by the sender and decoded by the receiver.

Looked at from this point of view, natural languages are codes, and they may be compared with other codes in all sorts of ways The problem lies in deciding what properties of the codes, or of the communication-systems in which they operate, are significant for the purpose of comparison and what properties are either insignificant or of less importance. (Lyons 1981:17-18)

The integration of these constituent models has become commonplace within linguistics—so much so that most linguists no longer consider it necessary to reference Shannon (1948) or Shannon and Weaver (1949), even when reproducing versions of the diagram initially published in Shannon (1948) (see again figure 3.6). Undoubtedly many of the linguists employing the code model are even unaware of where the diagram and

analogy originate. Nor are they aware of how Shannon's original theory differs from their misapplications of that theory via the code model.

3.3.4 Relationships contributing to integration of the constituent models

Section 3.3 has addressed the integration of the three constituent models which make up the code model of communication. The discussion has addressed Locke's use of conduit metaphors and the relationship of Locke's model with the speech circuit model proposed by Saussure. It has addressed the influence of Warren Weaver and the inclusion of conduit metaphorisms in discussions of information theory. It also addressed the integration of Saussure's speech circuit and information theory. Each of these events has had an influence in the development of the code model. In addition to these events, there has been complex history of development created as linguists quote one another. As it is briefly documented through the quotations presented in section 2.4, many linguist share the basic model, but they don't all use it in the same way. This complex history, combined with the diversity in application, makes it unlikely that any single linguist is responsible for formulating the code model. It should be equally apparent that no single linguist or school of linguistics is solely responsible for its development. Nevertheless, it is helpful to consider the general flow of information and influence that has contributed to that development. Figure 3.7 provides a loose flow chart of information and influence up through 1968, at least as it may be described in regard to theoreticians quoted in this study. While some relationships indicated do involve direct influence, for others the relationship is less direct. Accordingly, the chart is best viewed as a representation of familial relationships.

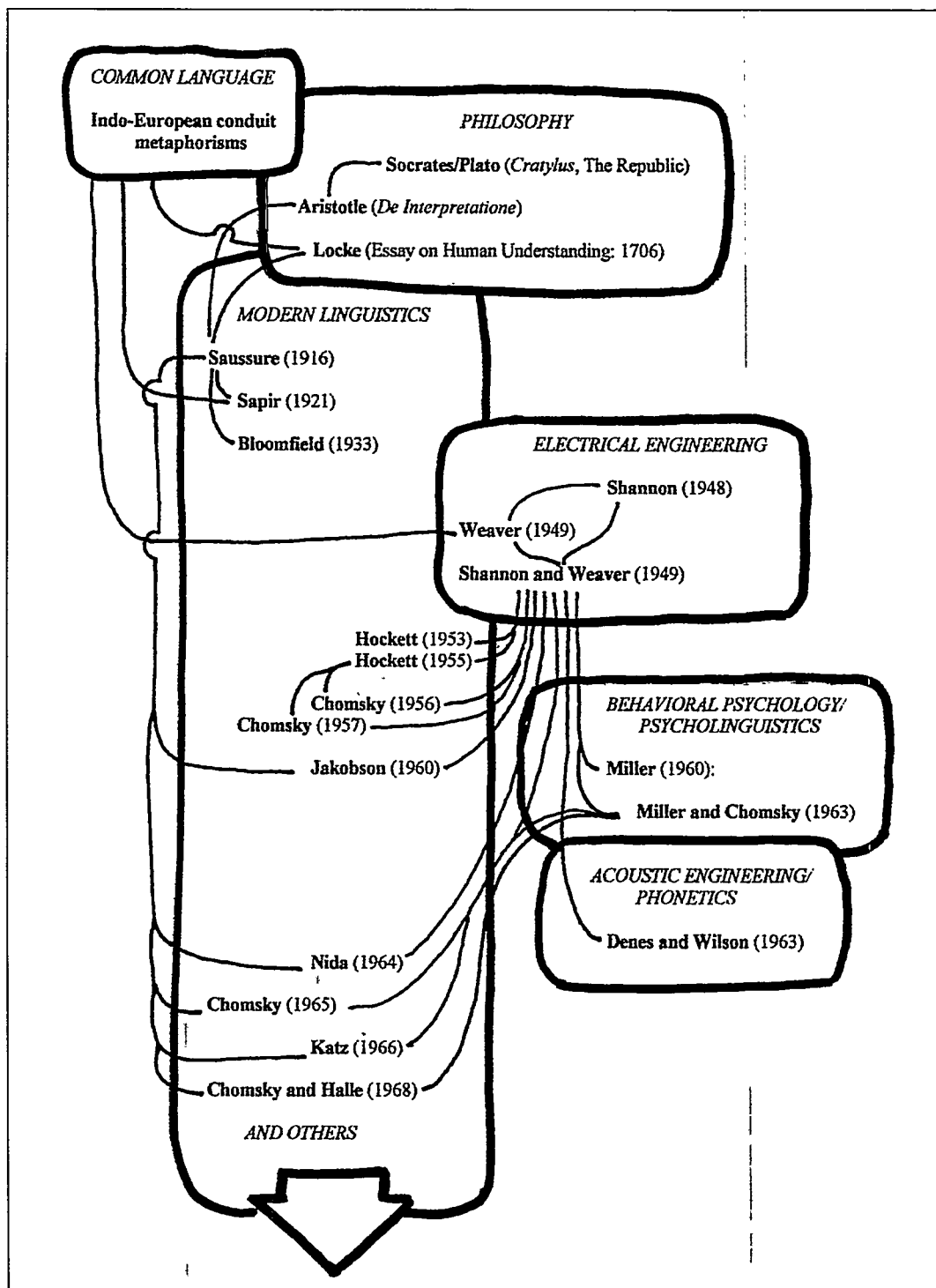


Figure 3.7. Flowchart of conceptual dependencies, either explicit or implicit, contributing to development of the code model. Thin lines indicate direct or indirect influence. Thick lines enclose intra-disciplinary influence.²⁷

3.4 Code model presuppositions

The definition of communication provided in David Crystal's book *A Dictionary of Linguistics and Phonetics* was quoted previously as an example of an appeal to the code model. John Lyons' definition of communication, similarly quoted, illustrated use of the code model in an explanation of semiotics. While Crystal's and Lyons' definitions are not necessarily representative of all linguists who employ the model, they do serve as a concise and authoritative means of identifying code model concepts. They write:

Communication A fundamental notion in the study of behavior, which acts as a frame of reference for linguistic and phonetic studies. Communication refers to the transmission of information (a 'message') between a source and receiver using a signalling system: in linguistic contexts, source and receiver are interpreted in human terms, the system involved is a language, and the notion of response to (or acknowledgement of) the message becomes of crucial importance. In theory, communication is said to have taken place if the information received is the same as that sent. (Crystal 1997:72)

There are certain concepts relevant to the investigation of all communication-systems, human and non-human, natural and artificial. A signal is transmitted from a sender to a receiver (or group of receivers) along a channel of communication. The signal will have a particular form and will convey a particular meaning (or message). The connection between the form of the signal and its meaning is established by what (in a rather general sense of the term) is commonly referred to in semiotics as the code: the message is encoded by the sender and decoded by the receiver.

Looked at from this point of view, natural languages are codes, and they may be compared with other codes in all sorts of ways The problem lies in deciding what properties of the codes, or of the communication-systems in which they operate, are significant for the purpose of comparison and what properties are either insignificant or of less importance. (Lyons 1981:17-18)

While these definitions do not overlap in every detail, they nevertheless stand as classic appeals to the code model. Several presuppositions concerning communication are embodied in these and other appeals to the code model quoted in this study.

Of course, it is impossible to actually *see* a linguist's presuppositions. A linguist may write about his presuppositions in literature he authors, which may be useful, but that is not the only means of "observing" them, nor is it necessarily the most accurate. As

suggested in section 2.3, it can be more productive to observe the metaphors and expressions employed. While these metaphors and expressions are in themselves simply statements, they nevertheless embody presuppositions. When such statements are shared and supported by a community, their collective effect identifies axioms held by that community. With code-model based statements, the collective effect allows one to identify these as *metatheoretical conceptual axioms*, that is, statements defining or evoking metatheoretical concepts which are generally accepted as true by the community of linguists employing them. While not all-inclusive, the following list of such axioms reflects basic code model presuppositions demonstrated in linguistic literature:

- Natural languages are codes defining the correspondence between sound and meaning.
- Languages (i.e., codes) are systematic, distinctive, and have an existence independent of any given speaker or hearer.
- Speaker and hearer must share a code in order for successful communication to proceed.
- The text conveys meaning.²⁸
- The speaker/author of the text encoded a message when he produced the text.
- Those receiving the text decode the message when they hear/read the text.
- Communication is successful when the message received is the same as that sent.
- Communication may be inhibited by noise.
- The speaker and hearer are connected via the channel of communication.
- Communication requires intention by the speaker and response by the hearer.
- The linguists' problem lies (primarily) in defining the code and (secondarily) in defining the processes of transmission and reception.²⁹

In considering this list, one must keep in mind that while the linguistic community is a group, it is a group of individuals. Accordingly, while group behavior is shared, it is

expressed individually. Thus, although there is no single instantiation of individual behavior which perfectly represents the normative behavior of the group, the individual expressions do not negate the collective affect.

In order to show that the basic list of code model axioms provided here does indeed reflect the metaphors and expressions employed by a group, each axiom is presented again in outline form, respectively followed by selected excerpts from quotations cited elsewhere in this study. While the quoted statements represent variety in expression of detail, they collectively provide strong support for the axioms listed.

- Natural languages are codes defining the correspondence between sound and meaning.
 1. "Natural languages are codes" (Lyons 1981:17-18).
 2. Natural languages "may be compared with other codes in all sorts of ways" (Lyons 1981:17-18).
 3. Speakers employ a code in communicating (Wardhaugh 1986:1).
 4. In human communication, the code is most often a language (Wardhaugh 1986:1).
 5. Language is a "complex, multi-level code, rather than a relatively simple matching of sound sequences with lexical meanings" (Givón 1989:81).
 6. "The grammar of the language is the system of rules that specifies [the] sound-meaning correspondence" (Chomsky and Halle 1968:3).
 7. The grammar of a language "determines an intrinsic connection of sound and meaning for each sentence" (Chomsky and Halle 1968:3).
 8. "The connection between the form of the signal and its meaning is established by ... the code" (Lyons 1981:17-18).
- Languages (i.e., codes) are systematic, distinctive, and have an existence independent of any given speaker or hearer.
 9. Speakers may have access to more than one code (Wardhaugh 1986:1).
 10. Codes may be mixed (Wardhaugh 1986:1).

11. Speakers may switch between codes during a single communicative event (Wardhaugh 1986:1).
 12. Communication involves use of a signaling system, which in linguistic contexts is a language (Crystal 1997:72).
 13. "The signal will have a particular form" (Lyons 1981:17-18).
 14. Languages may be said to have an existence independent of any given speaker or hearer (Wardhaugh 1986:2).
- Speaker and hearer must share a code in order for successful communication to proceed.
 15. Addresser and addressee must share a code in order for communication to be successful (Jakobson 1960:353).
 16. "Because the hearer employs the same system of rules to decode that the speaker employs to encode, an instance of successful linguistic communication occurs" (Katz 1966:103-104).
 17. The phonetic representation "is decoded into a representation of the same message that the speaker originally chose to convey to the hearer's equivalent system of linguistic rules" (Katz 1966:103-104).
 18. "The system (or the grammar, to use a well-known technical term) is something that each speaker 'knows'" (Wardhaugh 1986:1).
 19. "Communication among people is possible because such knowledge [of the language they speak] is shared with others, although how it is shared—or even how it is acquired—is not well understood" (Wardhaugh 1986:2).
 - The text conveys meaning.
 20. "Natural languages are vehicles for communication in which syntactically structured and acoustically realized objects transmit meaningful messages from one speaker to another" (Katz 1966:98).
 21. "Communication through the medium of spoken language is concerned with the conveying of concepts by means of vocal noises" (Lockwood 1972:1).
 22. The signal "will convey a particular meaning (or message)" (Lyons 1981:17-18).
 23. "Ideas to be transmitted are represented by a code that undergoes transformations as speech events proceed from one level to another" (Denes and Pinson 1993:6 [orig. 1963:6]).

- The speaker/author of the text encodes a message when he produces the text.
 24. The speaker's message is encoded in the form of a phonetic representation of an utterance by means of linguistic rules (Katz 1966:103-104).
 25. A speaker may "encode in language, through words and structures, his experience of processes of the external world and of the people and things that participate in them" (Halliday 1978:21).
 26. The addresser sends a message to the addressee (Jakobson 1960:353).
 27. An encoder may start with the content of his message and work through a linguistic process until it is expressed ultimately with sounds, non-verbal body movements, writing and/or other signals (Fleming 1990:25; preliminary edition, quoted with permission).
 28. The phonetic and syntactic structure of a linguistically produced acoustic phenomenon "encodes a speaker's inner, private thoughts or ideas" (Katz 1966:98).
- Those receiving the text decode the message when they hear/read the text.
 29. The phonetic and syntactic structure of a linguistically produced acoustic phenomenon may be decoded to generate an "inner, private experience of the same thoughts or ideas" as were held by the speaker generating the acoustic phenomena (Katz 1966:98).
 30. A decoder may start with input from the linguistic expression and work through the process until he is able to decode the content of the message (Fleming 1990:25; preliminary edition, quoted with permission).
 31. The message is encoded by the sender and decoded by the receiver (Lyons 1981:17-18).
- Communication is successful when the message received is the same as that sent.
 32. "The success of the communication is affected by the degree to which the inferred message of the decoder matches the intended message of the encoder" (Fleming 1990:25; preliminary edition, quoted with permission).
 33. "In theory, communication is said to have taken place if the information received is the same as that sent" (Crystal 1997:72).
- Communication may be inhibited by noise.
 34. Noise may inhibit the process of communication (Nida 1964:120-121).

35. "The ideal system is one which encodes just enough redundant information in signals to enable the receiver to recover any information lost as a result of noise" (Lyons 1977:45).
- The speaker and hearer are connected via the channel of communication.
 36. "There is no way that two nervous systems can be directly linked to each other, but language provides a means of encoding messages that can be transmitted in such a way that two or more systems can for all practical purposes achieve a linkup" (Pearson 1977:4).
 37. "A signal is transmitted from a sender to a receiver (or group of receivers) along a channel of communication" (Lyons 1981:17-18).
 38. Addresser and addressee must be connected via a physical channel and psychological connection (Jakobson 1960:353).
 - Communication requires intention by the speaker and response by the hearer.
 39. Discussion of communication may be limited "to events in which a person purposely produces signs which communicate something to receptors" (Nida 1960:12-121).
 40. Communication "occurs when one organism (the transmitter) encodes information into a signal which passes to another organism (the receiver) which decodes the signal and is capable of responding appropriately" (Ellis and Beattie 1986:3).
 41. "The receiver's response to (or acknowledgement of) the message becomes of crucial importance" (Crystal 1997:72).
 - The linguists' problem lies (primarily) in defining the code and (secondarily) in defining the processes of transmission and reception.
 42. "The basic question that can be asked about natural languages is: what are the principles for relating acoustic objects to meaningful messages that make a natural language so important and flexible a form of communication" (Katz 1966:98).
 43. "The goal of the descriptive study of a language is the construction of a grammar" (Chomsky and Halle 1968:3).
 44. "The system (or the grammar, to use a well-known technical term) is something that each speaker 'knows', but two very important questions for linguists are just what that 'knowledge' is knowledge of and how it may best be characterized" (Wardhaugh 1986:1).

45. The linguists' "problem lies in deciding what properties of the codes, or of the communication-systems in which they operate, are significant for the purpose of comparison and what properties are either insignificant or of less importance" (Lyons 1981:17-18).

Two additional points should be made concerning this list of axioms and the quotations cited. The first is in regard to Shannon's information theory. The second is in regard to literature which depends upon code model presuppositions, but which does not explicitly appeal to the model.

As was addressed in section 3.4, there is a place within linguistics where information theory can be correctly applied; that is in the context of phonetics and its relationship to phonology. For example, Hockett writes:

The Speech Transmitter converts the discrete flow of phonemes which comes to it into a *continuous speech signal*—a continuous train of sound waves. The code by which the Speech Transmitter performs this transduction is the *phonetic system* of the language. (Hockett 1955:5)

Were his account more specific, Hockett would have additionally identified the coordinated movement of articulatory organs and the responsive movement of acoustic organs, which respectively produce and intercept sound wave signals. In such an account, the inventory of phonemes serve as the *message alphabet*, the particular assemblage of phonemes serve as *primary message*, the phonetic production rules stand in the position of *code*, and the articulated movements of the vocal organs are the *signal alphabet*, which are then directly related to the sound wave *signal*. Hockett writes:

The phonetic system is the code according to which the Speech Transmitter converts its input (a flow of phonologic units) into sound waves; the same code governs the inverse operation of the Speech Receiver. (Hockett 1955:15)

Note, however, that from the perspective of the transmission process, it is irrelevant how the message may be used in a semantic context. The message must be assembled from the set of possible messages, but remember that in this context the set of possible messages is the set of phonemes (together with tones, pauses, and intonation).

Through the code, this set of possibilities is related to the signal alphabet (i.e., the range of articulatory movements possible). The syntactic arrangements of phonological “words” may be of great importance to the human assembling the sequence of phonemes which will be supplied to the transmission device, but provided the assemblage of phonemes fits the requirements of the message alphabet, the syntactic arrangement of the semantic morphemes and semantic “words” is irrelevant to the process of transmission and reception.³⁰ The transmission device is not concerned with whether or not an adjective and noun are properly ordered for a “grammatical” sentence. It is concerned only with the phonological components from which the string is assembled.

This is why a first-year-linguistics student can wrap his tongue around phonetics practice phrases, such as [a'klokšt'p^htš^hk^h] without having any true concern for how the word is used by native speakers. This is also how a phonetics teaching assistant can evaluate whether or not the student produced [a'klokšt'p^htš^hk^h] correctly during a quiz session. The teaching assistant has no more concern for how the word may be used by native speakers than did the student.³¹

This issue of the syntactic arrangement of phonological words is where Hockett eventually got his theory into trouble. Note that this was where he left the original domain of information theory and began to move into code model territory. Following Weaver's suggestions (Weaver 1949b), Hockett was attempting to extend the application of information theory from the sound transmission and reception to the domains of grammar and semantic interpretation. Noting Shannon's use of Markov processing in decoding an electronic signal, and following Weaver's suggestion that Markov processing could be “particularly promising for semantic studies” (Weaver 1949b:117), Hockett suggested that a similar process was employed in the “decoding” of a syntactic string of phonological words into their grammatical components. Crudely summarized, Markov processing is a

process of elimination wherein successive decisions and possibilities are weighted according to respectively successive states. Hockett wrongly anticipated that such a process would provide a mathematical account of natural language grammar; the product was finite state grammar. As Bothamley concisely reviews the history, "A finite state grammar models a sentence as a succession of 'states' progressing left-to-right. Each word chosen determines what can follow it. Chomsky proved that such a grammar could generate an infinite number of sentences, but could not cope with other aspects of language such as discontinuous structure" (1993:204; see Chomsky 1957, Hockett 1955). Although information theory was abandoned as an account of grammar, it continues to prove useful in regard to phonetics.

While use of the code model is *not* simply an appeal to information theory, some uses of the code model include an *embedded* appeal to information theory. Such embedded appeals are often confused by misapplied terminology, making them difficult to identify and evaluate. Nevertheless, that evaluation is important to an accurate understanding of code model concepts. When the embedded appeal is appropriately applied, it should be distinguished from the code model material which surrounds it. Consider, for example, the following quotation from Denes and Pinson, quoted previously in section 2.4 and cited above. In this quotation, the appeal to information theory is marked by underscoring for emphasis:

We may ... think of the speech chain as a communication system in which ideas to be transmitted are represented by a code that undergoes transformations as speech events proceed from one level to another. We can draw an analogy here between speech and Morse code. In Morse code, certain patterns of dots and dashes stand for different letters of the alphabet; the dots and dashes are a code for the letters. This code can also be transformed from one form to another. For example, a series of dots and dashes on a piece of paper can be converted into an acoustic sequence, like 'beep-bip-bip-beep'. In the same way, the words of our language are a code for concepts and material objects. The word "dog" is the code for a four-legged animal that wags its tail, just as "dash-dash-dash" is Morse code for the letter "O." ...

During speech transmission, the speaker's linguistic code of words and sentences is transformed into physiological and physical codes—in other words, into corresponding sets of muscle movements and air vibrations—being reconverted into linguistic code at the listener's end. This is analogous to translating the written 'dash-dash-dash' of Morse code into the sounds, 'beep-beep-beep'. (Denes and Pinson 1993:6 [orig. 1963:6]; underscore added)

In their analogy between speech transmission and Morse code, Denes and Pinson's appeal to information theory is not problematic, even though they do misuse the term code. Remember that in information theory, the code is not transformed. Rather, the code is the algorithm which defines the relationship between the message alphabet and the signal alphabet (see section 3.2.3.1.4). Denes and Pinson's appropriate application of information theory in regard to phonetics does not, however, keep them from employing the code model in the remainder of the quotation. But since the quotation is drawn from an introduction text on acoustic phonetics and related engineering concerns, their subsequent theorization has not been greatly hindered by their code model foundation. The applications to which they attend rely on the embedded information theory more so than on the code model material.

Nevertheless, in Denes and Pinson's view, the material here attributed to the code model and that reserved by information theory are integrally combined. The components are simply characterized via a speech chain analogy. Specifically, Denes and Pinson state that "ideas to be transmitted are represented by a code that undergoes transformations as speech events proceed from one level to another" (1993:6). As Harris says of Saussure's model, their model "represents communication as involving passage through a succession of phases arranged in linear progression along a track or pathway. In this succession there are no gaps" (1987:213-214). The result is, indeed, a code model account of communication. The chain analogy simply facilitates identification of the embedded information theoretic account of phonetic transmission. (See figure 3.8.)

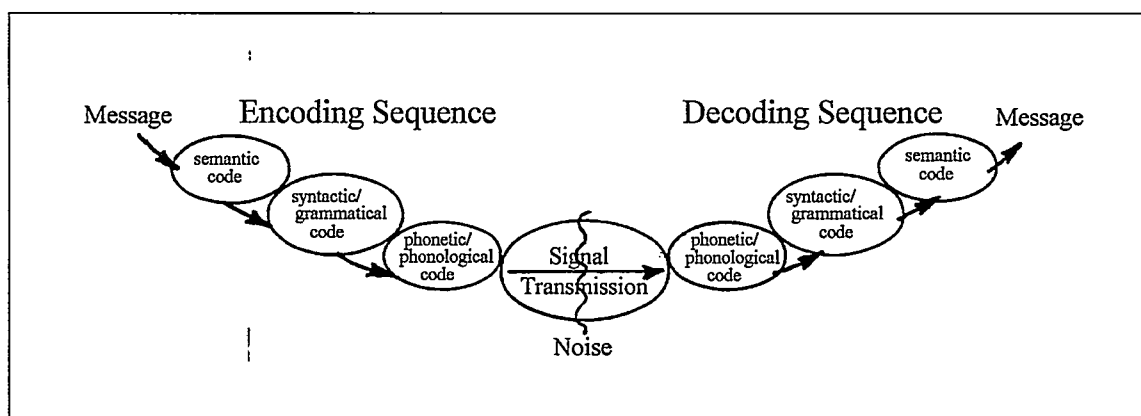


Figure 3.8. Diagram of a speech chain version of the code model, with an information theoretic account of phonetic transmission and reception embedded in the center “links.”

Rather than employing a speech chain analogy, many other linguists “lump” the grammatical, phonological, and phonetic “encoding” processes. These linguists also appeal to the information theoretic constituent in the code model, but they do not necessarily delimit the speech transmission components in the process of communication. Accordingly, they mix appropriate uses of information theory with inappropriate uses, creating confusion in the process. (See figure 3.9.)

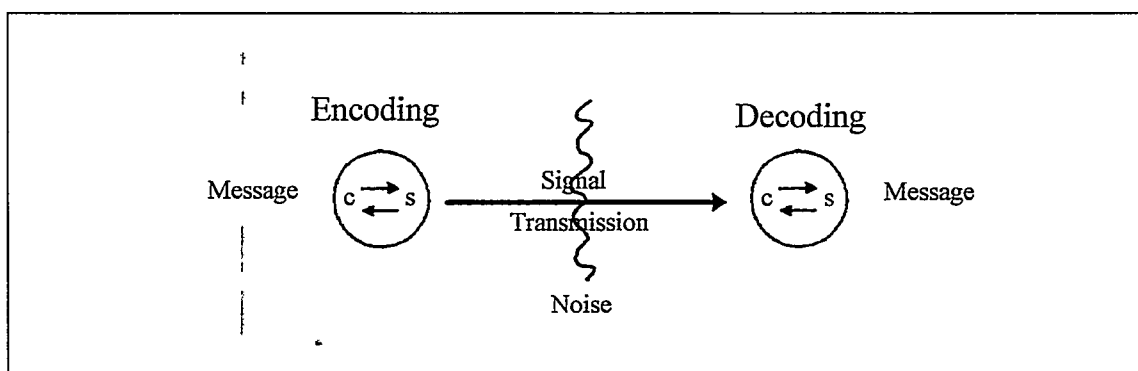


Figure 3.9. Diagram of a typical version of the code model, with information theoretic components conceptually tangled with other components. (C=concept, S=sound pattern; see figure 3.4).

An example of this type of embedding is illustrated in a quotation from Katz (1966), also quoted and cited above. Katz's general appeal does not differentiate the "encoding" of the meaning component of the communication process from the phonetic transmission component; they both fall with the notion of encoding and, respectively, decoding. Accordingly, the components of Katz's account which could be delimited for handling by the information theory are conceptually tangled with other components. Recall Katz's appeal to the "acoustic phenomenon whose phonetic and syntactic structure encodes a speaker's inner, private thoughts or ideas" (Katz 1966:98). Despite the fact that Katz confuses information theoretic terms and substitutes code model usage in their place, the information theoretic domain can be identified. It is marked here with underscoring:

Natural languages are vehicles for communication in which syntactically structured and acoustically realized objects transmit meaningful messages from one speaker to another. ... The basic question that can be asked about natural languages is: what are the principles for relating acoustic objects to meaningful messages that make a natural language so important and flexible a form of communication.

Roughly, linguistic communication consists in the production of some external, publicly observable, acoustic phenomenon whose phonetic and syntactic structure encodes a speaker's inner, private thoughts or ideas and the decoding of the phonetic and syntactic structure exhibited in such a physical phenomenon by other speakers in the form of an inner, private experience of the same thoughts or ideas. (Katz 1966:98; underscore added)

[The speaker's] message is encoded in the form of a phonetic representation of an utterance by means of the system of linguistic rules with which the speaker is equipped. This encoding then becomes a signal to the speaker's articulatory organs, and he vocalizes an utterance of the proper phonetic shape. This is, in turn, picked up by the hearer's auditory organs. The speech sounds that stimulate these organs are then converted into a neural signal from which a phonetic representation equivalent to the one into which the speaker encoded his message is obtained. This representation is decoded into a representation of the same message that the speaker originally chose to convey by the hearer's equivalent system of linguistic rules. Hence, because the hearer employs the same system of rules to decode that the speaker employs to encode, an instance of successful linguistic communication occurs. (Katz 1966:103-104; underscore added)

In addition to these variations of the model as demonstrated in Denes and Pinson (1993) and Katz (1966), both of which evoke the notion of codes and encoding for the various processes involved, Harris (1987:206) notes an additional permutation: "Some versions (e.g., Moulton 1970:23) restrict the terms 'encoding' and 'decoding' to those parts of the circuit which correspond to Saussure's 'psychological' sections. (Thus the transmission from A's brain to A's speech organs, for example, would not count as part of the 'encoding' process.)" Code model accounts which delimit application of coding terms to the psychological sections of the process may, correspondingly, tend to incorporate a more accurate embedded appeal to information theory. Nevertheless, any account of communication which goes *beyond the intended scope* of information theory should be interpreted as an integration of constituent models, and not simply as an appeal to Shannon's information theory.³²

The second point to consider in regard to code model presuppositions is that, while the outlined quotations above reference particular appeals to the code model, many other works of linguistic literature depend upon these same presuppositions, even though they may not make a concise appeal which can be conveniently quoted. As Crystal states, "Communication is a fundamental notion in the study of behavior, which acts as a frame of reference for linguistic and phonetic studies" (1997:72). Considering it unnecessary to define presuppositions regarding communication, such works typically take the final code model axiom as their starting point, that is: *The linguists' problem lies (primarily) in defining the code and (secondarily) in defining the processes of transmission and reception.*

CHAPTER IV

CODE MODEL LINGUISTICS: PATCH OR ABANDON?

4.1 A paradigm for linguistics?

In view of chapter 3, which discusses the origin of the code model and its adoption by linguists, and which identifies code model axioms common among linguists, one may be left with the following question: If the code model has had a significant role in the discipline of linguistics, how is it that this role has been so scarcely addressed in the literature? Thomas Kuhn's paradigm theory supplies grounds for an answer to this question. Simply put, he suggests a truism: *scientists rarely feel the need to discuss or debate the presuppositions that they share.*

Once the reception of a common paradigm has freed the scientific community from the need constantly to re-examine its first principles, the members of that community can concentrate exclusively upon the subtlest and most esoteric of the phenomena that concern it. (Kuhn 1996:163-164)

In other words, a group of scientists may take their own scientific principles for granted, so that they assume those principles are held in common, even if not addressed. Expressions of such principles may at one point look like laws of nature, while at another they serve to define nature itself. Kuhn states, "They function in part as laws but also in part as definitions of some of the symbols they deploy. Furthermore, the balance between their inseparable legislative and definitional force shifts over time" (Kuhn 1996:183). When the legislative role of principles shifts to a definitional role, the first principles become presuppositions.¹ Furthermore, Kuhn notes that the relative lack of concern and attention regarding first principles (and the rules so defined) continues only through a certain phase in the life cycle of a discipline. He writes:

Normal science can proceed without rules only so long as the relevant scientific community accepts without question the particular problem-solutions already achieved. *Rules should therefore become important and the characteristic unconcern about them vanish whenever paradigms or models are felt to be insecure.* That is, moreover, exactly what does occur. (Kuhn 1970:47; italics added)

Kuhn's paradigm theory proves to be a useful tool in the analysis of the code model and its significance within the discipline of linguistics. John Horgan provides a concise, non-technical summary of Kuhn's thesis:

The keystone of his model was the concept of a paradigm. Paradigm, pre-Kuhn, referred merely to an example that serves an educational purpose; *amo, amas, amat*, for instance, is a paradigm for teaching conjugations in Latin. Kuhn used the term to refer to a collection of procedures or ideas that instruct scientists, *implicitly*, what to believe and how to work. Most scientists never question the paradigm. They solve puzzles, problems whose solutions reinforce and extend the scope of the paradigm rather than challenge it. Kuhn called this "mopping up," or "normal science." There are always anomalies, phenomena that the paradigm cannot account for or that even contradict it. Anomalies are often ignored, but if they accumulate they may trigger a revolution (also called a paradigm shift, although not originally by Kuhn), in which scientists abandon the old paradigm for a new one.

Denying the view of science as a continual building process, Kuhn held that a revolution is a destructive as well as a creative act. The proposer of a new paradigm stands on the shoulders of giants (to borrow Newton's phrase) and then bashes them over the head. ... Most scientists yield to a new paradigm reluctantly. They often do not understand it, and they have no objective rules by which to judge it. Different paradigms have no common standard for comparison; they are "incommensurable," to use Kuhn's term. Proponents of different paradigms can argue forever without resolving their differences because they invest basic terms—motion, particle, space, time—with different meanings. The conversion of scientists is thus both a subjective and a political process. It may involve sudden, intuitive understanding Yet scientists often adopt a paradigm simply because it is backed by others with strong reputations or by a majority of the community. (Horgan 1996:42-43)

This study has already discussed the role of models as metaphor, and has shown that the code model serves as a conceptual metaphor for many linguists. Certain theoretical concepts advanced by Kuhn further elaborate upon the role of such models. For example, Kuhn notes that theory change often involves a change in metaphors:

Metaphor plays an essential role in establishing links between scientific language and the world. Those links are not, however, given once and for all. Theory change, in particular, is accompanied by a change in some of the

relevant metaphors and in the corresponding parts of the network of similarities through which terms attach to nature. ... I believe, too, ... that changes like these in the similarity network sometimes occur also in response to new discoveries, without any change in what would ordinarily be referred to as a scientific theory. Finally, these alterations in the way scientific terms attach to nature are not—logical empiricism to the contrary—purely formal or purely linguistic. On the contrary, they come about in response to pressures generated by observation or experiment, and they result in more effective ways of dealing with some aspects of some natural phenomena. They are thus substantive or cognitive. (Kuhn 1979:416)

Kuhn's theory proves useful to this analysis of the code model and its significance within the discipline of linguistics. Referencing Thomas Kuhn, however, is not a simple affair. Many theoreticians have argued against Kuhn, particularly in regard to the universality of his thesis and his suggestions concerning the development of disciplinary perspectives. Some antagonists argue that Kuhn's analysis may work reasonably well for the physical sciences, but consider it reductionism when applied to the social sciences (see Gutting 1980 for a review of criticisms of Kuhn).

Linguists differ in their attitudes regarding the usefulness of Kuhn's theory and its potential application to the history of linguistics. Some see in Kuhn's notion of paradigm shift an account of certain events in the history of linguistics. For example, the advent of generative linguistics is often described via paradigm-shift terminology (see Grace 1969, Lounsbury 1961, Pearson 1977, Thorne 1965, Voegelin and Voegelin 1963, Wells 1963). Other linguists discount the application of Kuhn's theory to linguistics. Reasons for rejecting Kuhn vary, but most antagonists within linguistics share the perspective that the co-existing schools of thought in linguistics are counter-evidence for Kuhn's hypotheses. They argue that, even if Kuhn's theory may account for the development of other disciplines, it is a poor fit for linguistics (see Figueroa 1994, Hymes 1974a, Percival 1976).

Unfortunately, Kuhn's theory regarding scientific paradigms has not always been well articulated or accurately represented within linguistic literature. Undoubtedly, one

reason for this is that Kuhn's own writings offer cause for confusion. His writings have been somewhat inconsistent both in choice of terminology, and in how those terms are defined and applied.

Kuhn is best known for his book, *The Structure of Scientific Revolutions*, first published in 1962. That book spells out the basis of his theory, including the idea of scientific paradigms, which is a central component of the theory; but, as many critics have pointed out, Kuhn employed the term paradigm in an ambiguous and polysemous manner (see Masterman 1970, Shapere 1964). Furthermore, he did not use the term consistently throughout his career. The multiple senses Kuhn employs make it a very flexible term, contributing to its diffusion into the popular vocabulary. Since 'paradigm' was essential to the theory as developed in the 1962 volume, confusion at this point proved exponential.

A second edition of the book was published in 1970. Noting the polysemy regarding the term paradigm, as well as several additional problems, Kuhn offered a revision to his theory in that volume, by adding a postscript to a reprint of the original 1962 text. Properly understood, then, the 1970 volume represents *two generations* of Kuhn's theory. Unfortunately, students and critics alike have seldom addressed the essential changes in the Postscript.

In 1989 another significant contribution to the Kuhnian project occurred with the publication of Paul Hoyningen-Huene's *Die Wissenschaftsphilosophie Thomas S. Kuhns: Rekonstruktion und Grundlagenprobleme*. Later translated into English and published as *Reconstructing Scientific Revolutions: Thomas S. Kuhn's Philosophy of Science* (1993), this authoritative compilation is undoubtedly the most comprehensive critical overview of the Kuhnian project yet undertaken. For those interested in Kuhn's work, the fact that Kuhn authors the foreward to Hoyningen-Huene (1993) and endorses Hoyningen-Huene's analysis is certainly not insignificant (Kuhn 1993:xi-xiii). But in terms of philosophical

developments, perhaps even more important is the fact that Kuhn uses the occasion of that foreward in much the same way as he used the Postscript of his own 1970 edition, as a modest arena for introducing yet another revision to his famous theory. Several issues are discussed there, but most significant is his all-too-brief discussion of the role of *individuals* within the group experience of scientific revolution (1993: xii-xiii).

In 1996, *The Structure of Scientific Revolutions* was republished in a third edition, which, apart from the addition of an index, includes no changes from the 1970 volume.²

If the present discussion of the code model is to benefit from use of Kuhn's theory, an effort must be made to untangle both the theory and certain criticisms. Several authors provide discussion and bibliographical listings of debate over Kuhn's theory (Burricher 1979, Gutting 1980, Hacking 1981, Hoyningen-Huene 1993, Kisiel and Johnson 1974, Laudan 1984, Laudan et al. 1986, Spiegel-Rösing 1973, and Stegmüller 1973). No attempt will be made here to review the breadth of that literature. Rather, attention is given to how the theory fits within *this* study, as well as addressing how various *linguists* have responded to Kuhn. Since linguists have not displayed agreement regarding how, or even if, Kuhn's theory provides a satisfactory account for the history of their discipline, that question is addressed in this section. In particular, the study builds upon four main components of Kuhn's theory:

- Kuhn's two major senses of 'paradigm', shared examples and constellation of group commitments.
- Kuhn's idea of a disciplinary life-cycle, as regards immaturity and maturity, and the role of a paradigm within that cycle
- Kuhn's ideas regarding contrasts between the phases of normal science and revolutionary science

- Kuhn's idea of incommensurability, particularly as it applies to the pre and post revolution paradigm communities

Each of these four components will be summarized, followed by discussion of linguists' responses and the significance each component has for the present study. The study now turns to a review of Kuhn's theory.

4.1.1 Kuhn's 'paradigms'

As mentioned previously, the term paradigm was already used in English prior to Kuhn's selecting it for his purposes. In Saussurean structuralism, the term was applied to relationships between signs. In other disciplines, the term had been used more generally, in referring to examples or patterns, especially "an outstanding clear or typical example or archetype" (Mish 1983). Of course Kuhn was well aware of these common and well-established senses. Indeed, it was this second sense, regarding examples or archetypes, which he intended to evoke in developing the term. He quickly broadened his use of the term, however, so that it referred not only to examples (or 'problem-solutions', as he came to express it), but also to various other elements in the practice of science. Unfortunately, Kuhn was not consistent in how he used the term, and that inconsistency led to much confusion among his readers. A brief review of the senses in which Kuhn used the term helps considerably to untangle the theory.

Within that review, perhaps the most notable point of confusion stems from the fact that, in the 1962 text, Kuhn did not adequately distinguish the terms 'paradigm' and 'theory'. Undoubtedly, many readers continue to struggle with this ambiguity. In some places, Kuhn used the terms interchangeably, while in others he seemed to suggest a hierarchical or evolutionary relationship between the two. For example, he writes, "once it has achieved the status of paradigm, a scientific theory is declared invalid only if an alternative candidate is available to take its place" (1996:77). In other places he suggested

that paradigm and theory were somehow independent: "The paradigm applications of the caloric theory ... " (1996:29). And still other places he uses them in such a way as to make them nearly inseparable: "The existence of the paradigm sets the problem to be solved; often the *paradigm theory* is implicated directly in the design of apparatus able to solve the problem" (1996:27; italics added).

Kuhn would later distinguish the terms, as will be discussed, but he did not adequately address more abstract uses of the term, such as its occasional synonymy with 'metatheory' and what might be called disciplinary worldview. This is in spite of the fact that he devotes an entire chapter of *Structure* to discussing "Revolutions as Changes in World View" (1996: chapter 10). In part, the concepts of theory and metatheory were simply subsumed under the idea of *group commitment* and *disciplinary matrix*, terms coined in the 1970 Postscript to help alleviate earlier confusion surrounding the term paradigm.

In the Postscript, Kuhn elected to keep the term paradigm, but he delimited the definition somewhat, so that it included two main senses. The primary sense was that of *shared examples* (which he sometimes calls puzzle-solutions), a sense which built upon the original sense of the term as borrowed from common usage. The secondary sense referred to the body (or constellation) of *group commitments* held by a community of scientists. These commitments were in regard to the presuppositions, philosophy, and manner of "doing" the particular science. In the Postscript, he writes:

In much of the book [the 1962 text] the term 'paradigm' is used in two different senses. On the one hand, it stands for the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community. On the other, it denotes one sort of element in that constellation, the concrete puzzle-solutions which, employed as models or examples, can replace explicit rules as a basis for the solution of the remaining puzzles of normal science. ... Philosophically, at least, this second sense of 'paradigm' is the deeper of the two, and the claims I have made in its name are the main sources for the controversies and misunderstandings that the book has evoked,

particularly for the charge that I make of science a subjective and irrational enterprise. (Kuhn 1996:175)

Also in the Postscript, he writes, "The paradigm as shared example is the central element of what I now take to be the most novel and least understood aspect of this book" (Kuhn 1996:187).

The notion of group commitment gave rise to the term disciplinary matrix. As Kuhn sees it, groups are committed *to* something. While he had previously used the term paradigm in referring to both commitments *and* the objects of those commitments, in the 1970 Postscript he elected to isolate the objects, grouping them under the neologism *disciplinary matrix*. He writes: "All or most of the objects of group commitment that my original text makes paradigms, parts of paradigms, or paradigmatic are constituents of the disciplinary matrix" (Kuhn 1996:182). As with his other terminology, Kuhn was to be inconsistent with this term as well. Hoyningen-Huene points out that he later abandoned even his use of the term disciplinary matrix, reverting to use of the commonly understood term theory (Hoyningen-Huene 1993:142-143). (He had alluded to the common use of the term theory in 1970, but at that time expressed dissatisfaction for how the term is often employed (1996:182).) Following 1970, the term disciplinary matrix no longer appears in his writings.

The literature addressing Kuhn suggests that many critics overlook Kuhn's later (1970) clarification and delimitation regarding the senses of paradigm, presumably because that clarification was relegated to the Postscript. Even for readers who have incorporated the Postscript material into their understanding of Kuhn's theory, the fact that he used the term paradigm in reference to a constellation of commitments *as well as* in reference to shared examples (or problem-solutions) proves problematic. The problem lies in the fact that the single term paradigm is being used to refer to *two different levels* in the abstract structure of a science.

As mentioned, when originally creating a niche for the term paradigm within the philosophy of science, Kuhn was attempting to highlight the significance of shared examples and problem-solutions, as he came to call them (1996:187). It became his infamous habit to extend that term to increasingly complex levels of abstraction, so that at one point he used the term in reference to five different levels. The term paradigm initially referred to *shared examples and problem-solutions*, both of which are concrete elements in the scientists repertoire; but from there Kuhn extended the term, first to *theory*, then *metatheory*, then *disciplinary matrix*, and finally to the *constellation of group commitments* embraced by a discipline. Described in this manner, it is obvious that the resulting polysemy extends from Kuhn's overuse of metonymy.³ Semantic pathology was the end result. (Again, semantic pathology arises "whenever two or more incompatible senses capable of figuring meaningfully in the same context develop around the same name" (Ullman 1957:122, in Reddy 1979:299).) That pathology is never entirely resolved in the 1970 text (nor its 1996 reprint), for while Kuhn abandons some terms and coins a few replacements in the Postscript section, he continues to refer to both shared examples and group commitments with the single term paradigm, even though these terms represent opposing extremes of his metonymic continuum. Hoyningen-Huene writes:

Kuhn's writings didn't stick to the original meaning of the paradigm concept. Paradigms in their original sense are, according to their first appearance on the scene, "concrete problem solutions that the profession has come to accept." But Kuhn soon used the paradigm concept for other senses, in works composed around the same time as *SSR* [*The Structure of Scientific Revolutions*] and even in *SSR*, without being fully aware that he was doing so. (Hoyningen-Huene 1993:140)

In later writings, Kuhn did finally abandoned his use of the term paradigm in reference to group commitments. He chose to limit its use to the original sense, referring to the shared examples (or problem-solutions). From there he began to refer to group commitments as just that, group commitments. (See figure 4.1.)

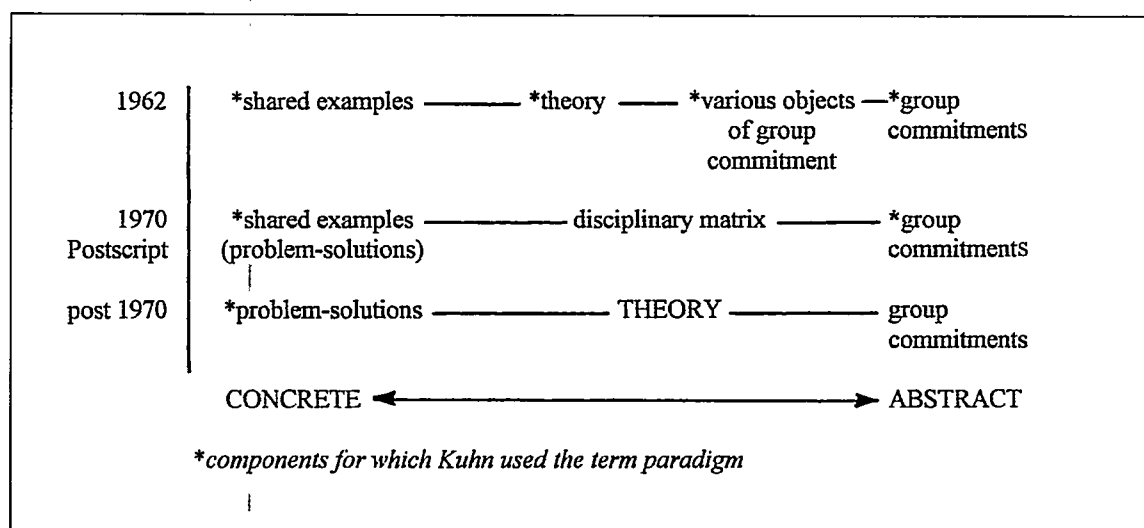


Figure 4.1. Metonymic continua Kuhn created through his various uses of the term paradigm.

4.1.2 Selecting operational definitions

The semantic pathology and inconsistency in Kuhn's choice of terminology, together with the abundance of Kuhn's writings and those of his critics and proponents, through which that inconsistency persists, threaten to undermine the potential usefulness of his theory. Nevertheless, by carefully identifying operational definitions one may use Kuhn's *theory* to benefit, even if an alternative set of terminology may be required. The question remains, however, as to just how the term *paradigm* should be used, and if it should be used at all. While Kuhn did eventually abandon use of the term for all but the shared examples and problem-solutions, the history of its prior usage cannot be retracted. The problem is compounded by the 1996 reprint of *Structure*, particularly since that book does not include any sort of an introduction explaining the term's role within the history of the Kuhnian project. Accordingly, newcomers to the project are destined to struggle with the metonymic continua, just as did readers of the earlier 1962 and 1970 editions.

As Kuhn recognized, few readers seem to have grasped the significance of the shared examples component of disciplinary practice (Kuhn 1996:187). Accordingly, few critics employ the term paradigm in reference to that component. Instead, it seems that most contemporary readers employ the term in one of two ways: (a) in reference to a type of theory, or (b) in reference to a disciplinary worldview. Theory can be generally defined as “a formulation of underlying principles of certain observed phenomena” (Neufeldt 1989). It should be clear at this point that Kuhn referred to much more than the simple notion of theory. In most places where he refers to a theory as a *paradigm*, he is commenting upon the fact that a community of scientists has made the theory a *fulcrum* upon which elements of disciplinary belief and practice are balanced and levered. This sense of the term is related to the second common understanding of the term, as a disciplinary worldview. Worldview can be generally defined as “a comprehensive conception or apprehension of the world esp. from a specific standpoint” (Mish 1983). Disciplinary worldview may then be defined as *a comprehensive conception or apprehension of the topic of study, especially as characterized from the specific standpoint of a disciplinary community*. This sense of the term is in agreement with Kuhn’s description of scientific revolution as a change in worldview (1996:111ff).

What is it about the shared examples and problem-solutions that Kuhn considered to be so important? Why did he finally reserve the term paradigm for reference to this component? Kuhn seems to have envisioned the disciplinary belief and practice as a massive abstract network. At various points in his writings and times in his career he was comfortable referring to nearly all of the nodes in that network as being a paradigm or paradigmatic. But that does not mean that he considered all of the nodes in the network to be equally related or to have equal importance in the system. Rather, he recognized that no matter how the various nodes may be related to each other, they were all related to the one

concrete node, the shared examples and problem-solution component. It is through actual practice with these shared examples and problem-solutions that the scientist learns his or her trade. As Horgan concisely explains regarding the term paradigm, "Kuhn used the term to refer to a collection of procedures or ideas that instruct scientists, *implicitly*, what to believe and how to work" (Horgan 1996:42-43). Furthermore, while Kuhn recognizes that the members of a scientific community are individuals (and as such their personal conceptions of the disciplinary network will not overlap in all details), he identifies the node of shared examples and problem-solutions as the node most likely to be shared by all members of a scientific community. Indeed, without that node, it is not likely that an individual will ever learn "what to believe and how to work" within the disciplinary community.

Since Kuhn has supplied alternative terminology (such as problem-solution, models, theory, etc.), this study will employ his alternative terms whenever the intended sense of paradigm is not clear. Where the intended sense is not obvious in quoted material, alternative terms are offered in brackets. Definitions for important terminology follow:

- **Community/Group:** scientists working together and/or conferring with one another, either in person or through the medium of disciplinary literature. While a group is obviously composed of individuals, if it is functioning as a group, then the individuals will, to varying degrees, share beliefs and behavior patterns.
- **Group Commitment:** conscious or subconscious obligations and/or allegiance to a particular manner of scientific methodology and perspective; often generated by a particular metatheory. Kuhn writes of the commitments not simply as a body, but as an organized group, a "constellation."

- **Metatheory:** ideology or theoretical presuppositions; underlying beliefs which generate a particular approach; generally extend from first principles established in early stages of the paradigmatic life cycle
- **Disciplinary Matrix:** the objects of group commitment. Kuhn lists these as: (1) symbolic generalizations, (2) models, (3) values, (4) exemplars. The basic term theory in some senses captures these, as well as the related notion of methodology. While Kuhn chose to abandon the term 'disciplinary matrix' post-1970, it will be retained here since it is a useful term. Theory, alone, does not capture the individual components, nor is it adequately identified, in its common usage, as an *object* of commitment.
- **Shared Examples:** in particular, this refers to concrete problems and their solutions which a discipline employs as models or patterns for organizing investigation, as well as in teaching presuppositions and perspective. Shared examples can include conceptual models and exemplars (two of the elements of the disciplinary matrix).

The following discussion addresses these terms more fully, both in regard to how Kuhn used them and, later, in regard to the code model of communication and linguistics.

4.1.3 Paradigm communities

Kuhn broadly defines paradigms in terms of a group's conceptual commitments, offering the heading "Paradigms as the Constellation of Group Commitments" (1996:175,181). Because paradigms involve metatheory, they command orthodox ways of viewing the subject of inquiry and canonical approaches to its study. They comprise the disciplinary worldview of the scientific community in question. Stated as such, a definition of such a community can be potentially circular, but not necessarily so. Kuhn suggests that "Scientific communities can and should be isolated without prior recourse to

paradigms; the latter can then be discovered by scrutinizing the behavior of a given community's members" (Kuhn 1996:176). For example, groups and subgroups tend to define themselves through academic associations and conference attendance. A group can thereby be identified according to its own terms. Kuhn continues:

Both normal science and revolutions are ... community-based activities. To discover and analyze them, one must first unravel the changing community structure of the sciences over time. *A paradigm governs, in the first instance, not a subject matter but rather a group of practitioners.* Any study of paradigm-directed or of paradigm-shattering research must begin by locating the responsible group or groups. (Kuhn 1996:179, 180; italics added)

Here Kuhn uses the term 'paradigm' in the sense of 'commitment' and 'metatheory'. He is arguing that, if one desires to study anthropologists, for example, and one finds a group of anthropologists identifying themselves as neo-functionalists, then one may reasonably hypothesize that the members of this self-defined group share a paradigm.

Kuhn also acknowledges that a group may not call *themselves* anything. Such anonymity does not negate the existence of group commitments. It may simply indicate that the said group represents the unmarked case. While identification of such commitments may be more difficult than for those of a named group, an analyst may still discover shared behavior.

4.1.4 Disciplinary matrix

In coining and isolating the terms disciplinary matrix and shared examples, Kuhn attempts to isolate his definition of the conceptual commitments of a paradigm from the means by which that paradigmatic perspective is learned. The four components of a disciplinary matrix are closely related and overlap to some extent. They include symbolic generalizations, models, values, and exemplars (Kuhn 1996:174-191).

By symbolic generalizations Kuhn intends "those expressions, deployed without question or dissent by group members, which can readily be cast into a logical form"

(1996:182). In some disciplines these expressions take the form of symbols and equations while in others they are commonly expressed in prose. In either case they are used to formulate the laws and definitions embraced by the community. Some expressions look like laws of nature; others serve to define nature itself. Kuhn states, "They function in part as laws but also in part as definitions of some of the symbols they deploy. Furthermore, the balance between their inseparable legislative and definitional force shifts over time" (Kuhn 1996:183).

In addressing models, Kuhn includes both the ontological and heuristic varieties. He states that models supply the group with "preferred or permissible analogies and metaphors. By doing so they help to determine what will be accepted as an explanation and a puzzle-solution; conversely, they assist in the determination of the roster of unsolved puzzles and in the evaluation of the importance of each" (Kuhn 1996:184).⁴

In discussing the third component, 'values', Kuhn suggests that they are "more widely shared among different communities than either symbolic generalizations or models, and they do much to provide a sense of community to natural scientists as a whole" (Kuhn 1996:184). "Probably the most deeply held values concern predictions: they should be accurate; quantitative predictions are preferable to qualitative ones; whatever the margin of permissible error, it should be consistently satisfied in a given field; and so on" (1996:185). Kuhn continues, "There are also, however, values to be used in judging whole theories: they must, first and foremost, permit puzzle-formulation and solution; where possible they should be simple, self-consistent, and plausible, [—]compatible, that is, with other theories currently deployed" (1996:185).⁵

With regard to exemplars Kuhn points to the most tangible of the components. He defines exemplars as "the concrete problem-solutions that students encounter from the start of their scientific education, whether in laboratories, on examinations, or at the ends

of chapters in science texts" (1996:187). (He notes that technical problem-solutions found in the periodical literature also serve this role.) Of course, Kuhn is well aware that different communities employ exemplars in differing ways, as well as employing certain exemplars peculiar to themselves. He comments, "More than other sorts of components of the disciplinary matrix, differences between sets of exemplars provide the community fine-structure of science. All physicists, for example, begin by learning the same exemplars As their training develops, however, the symbolic generalizations they share are increasingly illustrated by different exemplars," so that while they share a particular equation, "only its more elementary applications are common to both groups" (1996:187). In other words, while the larger community may share basic exemplars, particular modifications and applications will be increasingly community and subcommunity specific. The ways in which subcommunities use and modify exemplars proves to be quite significant, for as Kuhn explains, scientific revolution typically begins at the subcommunity level.

4.1.5 Shared examples

Kuhn's original use of the term paradigm was in addressing a *body* of shared examples and the role they play in a student's disciplinary socialization. He was not concerned so much with *particular* exemplars within a disciplinary matrix, but rather with how paradigms are learned and absorbed through a tacit learning process.⁶ Exemplars are the primary type of shared example which Kuhn addresses, but models may also serve within this component.

As Kuhn describes it, students do not typically or simply study a theory in the abstract; rather, they work problems. In describing the role and function of these problems, Kuhn is careful to identify his position as distinct from a traditional position held by philosophers of science, that "scientific knowledge is embedded in theory and

rules; problems are [simply] supplied to gain facility in their application” (1996:187). Kuhn argues that such “localization of the cognitive content of science is wrong” (1996:187). In contrast to the traditional position, he describes the relationship of theory and problems as follows:

After the student has done many problems, he may gain only added facility by solving more. But at the start and for some time after, doing problems is learning consequential things about nature. In the absence of such exemplars, the laws and theories he has previously learned would have little empirical content. (Kuhn 1996:187, 188)

Beginning with elementary problems and then moving into increasingly complex ones, the student learns to pick out from among presumably infinite possibilities the particularly relevant categories which the theory has detailed.

Kuhn suggests that scientists generally “solve puzzles by modeling them on previous puzzle-solutions, often with only minimal recourse to symbolic generalizations” (1996:189,190). In so doing, they learn “from problems to see situations as like each other, as subjects for the application of the same scientific law or law-sketch” (1996:190).

That sort of learning is not acquired by exclusively verbal means. Rather it comes as one is given words together with concrete examples of how they function in use; nature and words are learned together. ... what results from this process is “tacit knowledge” which is learned by doing science rather than by acquiring rules for doing it. (Kuhn 1996:191)

Kuhn emphasizes the perspective-building role of problem working, stating:

The resultant ability to see a variety of situations as like each other ... is, I think, the main thing a student acquires by doing exemplary problems, whether with a pencil and paper or in a well-designed laboratory. After he has completed a certain number, which may vary widely from one individual to the next, he views the situations that confront him as a scientist in the same gestalt as other members of his specialist’s group. For him they are no longer the same situation he had encountered when his training began. He has meanwhile assimilated a time-tested and group-licensed way of seeing. (Kuhn 1996:189)

4.1.6 The mega-paradigm

Many of Kuhn's critics have assumed that by 'paradigm' Kuhn intended the idea of a Grand Unified Theory. Considering the polysemy involved in his writings, their understanding of a relationship between paradigms and theories is understandable. However, the relative attention some critics give to theories of a grand and unified nature is unfortunate. In assuming he is only addressing mega-theories, they have failed to recognize Kuhn's interest in change at both macro *and* micro levels. Kuhn considers change at these extremes to differ only in degree, with little or no difference in the kind of processes involved.¹ In the 1970 Postscript, he writes:

Partly because of the examples I have chosen and partly because of my vagueness about the nature and size of the relevant communities, a few readers of this book [1962 edition] have concluded that my concern is primarily or exclusively with major revolutions such as those associated with Copernicus, Newton, Darwin, or Einstein. A clearer delineation of community structure should, however, help to enforce the rather different impression I have tried to create. A revolution for me is a special sort of change involving a certain sort of reconstruction of group commitments. *But it need not be a large change, nor need it seem revolutionary to those outside a single community, consisting perhaps of fewer than twenty-five people. It is just because this type of change, little recognized or discussed in the literature of the philosophy of science, occurs so regularly on this smaller scale that revolutionary, as against cumulative, change so badly needs to be understood.* (Kuhn 1996:180, 181; italics added)

Kuhn's comments regarding "revolutionary, as against cumulative change" are especially important to note here, for his distinction between the two types of change contributes significantly to his position on incommensurability (as will be discussed in section 4.1.8). Kuhn is not suggesting that all change within science is of a revolutionary nature. He states: "Normal research, which *is* cumulative, owes its success to the ability of scientists regularly to select problems that can be solved with conceptual and instrumental techniques close to those already in existence" (1996:96; italics in original). Such cumulative change may retain commensurability. In contrast, revolutionary change

contributes to *incommensurability* (Kenneth A. McElhanon 1998, personal communication).

4.1.7 Disciplinary maturation

Many of those employing and criticizing Kuhn commonly assume that his term 'paradigm' refers exclusively to the first "Grand Theory" embraced by a discipline, or to a 'First Paradigm' as Keith Percival interprets it (1976:187). This assumption is reasonable if based only upon the 1962 edition, but inaccurate if Kuhn's 1970 Postscript is considered.

In the 1962 text, Kuhn did suggest that disciplinary sciences develop from an immature pre-paradigm phase into a mature paradigm-phase. In the 1970 Postscript, however, he responds to criticisms on this issue and modifies the earlier characterization. He acknowledges that the pre-paradigm versus post-paradigm characterization he had offered earlier seemed to suggest that no paradigms existed in the earlier phase. He explains that the emphasis should be on the nature of the paradigms (that is to say the nature of group commitments), rather than upon the grand status or universality of any particular paradigm.

Kuhn proposes the contrasting phases in order to highlight how scientists operate within the developing history of a discipline. While his terms for the phases—'immature' and 'mature'—have drawn criticism, the distinctive situations Kuhn identifies remain noteworthy. In particular, he is emphasizing distinctions between two situations:

- (a) a situation in which theoreticians are competing for definition of the field (a situation which typically occurs in the immature, early developmental stages of a discipline),
 - (b) a situation in which scientists take the foundations of their field for granted (a situation which typically occurs some time later, in the mature stages of a discipline's growth)
- (Kuhn 1996:178).

In the earlier phase, theoreticians are wrestling with epistemological questions and striving to define their ontology. In the later phase, they are content to work within a defined ontology and may appeal to that ontology as a means of delimiting their inquiry.

Kuhn elaborates:

The nature of that transition to maturity deserves fuller discussion than it has received in this book [1962 text], particularly from those concerned with the development of the contemporary social sciences. To that end it may help to point out that the transition need not (I now think should not) be associated with the first acquisition of a paradigm. The members of all scientific communities, including the schools of the "pre-paradigm" period, share the sorts of elements which I have collectively labeled 'a paradigm.' *What changes with the transition to maturity is not the presence of a paradigm but rather its nature.* Only after the change is normal puzzle-solving research possible. Many of the attributes of a developed science which I have above associated with the acquisition of a paradigm I would therefore now discuss as consequences of the acquisition of the sort of paradigm that identifies challenging puzzles, supplies clues to their solution, and guarantees that the truly clever practitioner will succeed. Only those who have taken courage from observing that their own field (or school) has paradigms are likely to feel that something important is sacrificed by the change. (Kuhn 1996:179; italics added)

Related to Kuhn's early dichotomy of 'immature' and 'mature' disciplines was an implicit dichotomization of 'sciences' and 'non-sciences' (1969; 1996:209). Kuhn has not suggested that the 'non-sciences' have no paradigms. Rather, he has suggested that 'mature sciences' (e.g., physics, astronomy) tend to be unified around a single paradigm, whereas apparently mature 'non-sciences' (e.g., art, music) do not seem to exhibit that same level of unity. While not a crucial point in his theory, the simplistic dichotomization of 'sciences' and 'non-sciences' has drawn considerable criticism, particularly from within the social sciences (e.g., history, political science, and, as will be discussed, linguistics).

4.1.8 'Revolution' and the 'incommensurability hypothesis'

Kuhn explains that disciplines in a mature state engage in what he calls normal science. This is a situation where the practitioners know how to go about the business of

their research and are involved in normal problem solving. They are generally content with the tools their paradigm supplies, and as Kuhn explains, "So long as the tools a paradigm supplies continue to prove capable of solving the problems it defines, science moves fastest and penetrates most deeply through confident employment of those tools" (1996:76).

Eventually researchers begin hitting upon more and more areas which prove anomalous for their paradigm. Of researchers in the normal science phase, he states, "Though they may begin to lose faith and then to consider alternatives, they do not renounce the paradigm that has led them into crisis. They do not, that is, treat anomalies as counter-instances, though in the vocabulary of philosophy of science that is what they are" (Kuhn 1996:77). Kuhn explains that "once it has achieved the status of paradigm [(i.e., a canonical position within the disciplinary matrix)], a scientific theory is declared invalid only if an alternative candidate is available to take its place" (1996:77).⁷

How scientists handle crises in their paradigms is, of course, a significant issue. The standard view of falsification suggests that scientists simply compare the accounts provided by the theories in their disciplinary matrix to the reality of the natural world. If the two do not match, then they develop a new theory.

Kuhn argues that a study of the history of science should require us to reject this description of the process. He argues that scientists engaged in normal science will not immediately abandon their theories in the face of anomalies, but rather "will devise numerous articulations and *ad hoc* modifications of their theory in order to eliminate any apparent conflict" (1996:78). Kuhn likens the process of normal science to that of playing chess:

In so far as he is engaged in normal science, the research worker is a solver of puzzles, not a tester of paradigms. Though he may, during the search for a particular puzzle's solution, try out a number of alternative approaches, rejecting those that fail to yield the desired result, he is not testing the *paradigm*

when he does so. Instead he is like the chess player who, with a problem stated and the board physically or mentally before him, tries out various alternative moves in the search for a solution. These trial attempts, whether by the chess player or by the scientist, are trials only of themselves, not of the rules of the game. They are possible only so long as the paradigm itself is taken for granted. Therefore, paradigm-testing occurs only after persistent failure to solve a noteworthy puzzle has given rise to crisis. (Kuhn 1996:144-145; italics in original)

A crisis can be created in numerous ways: the advent of new discoveries, advancements in technology, or through the simple cumulative weight of anomalies. Whatever the cause, dissatisfaction builds. Sometimes the crisis is felt in the community as a whole and sometimes only within subgroups, but the crisis creates a special situation. If during this time a new theory is proposed which serves to re-characterize the subject and manner of study, scientists may begin to change allegiance, abandoning the earlier paradigm and building a new one around the new theory. Kuhn emphasizes that there is no intermediate stage wherein scientists have abandoned an earlier paradigm and entered a paradigm-free or neutral state. As he explains, "The decision to reject one paradigm is always simultaneously the decision to accept another, and the judgment leading to that decision involves the comparison of both paradigms with nature *and* with each other" (Kuhn 1996:77).⁸

This change of allegiance is a process Kuhn calls scientific revolution. (It has since become additionally known as the process of *paradigm shift*.) Again, it is not simply a matter of adjusting one's perspective, as is done during normal science. It is better viewed as a matter of gestalt switch—in a relative instant the scientist finds himself or herself considering the world of inquiry in a new and different way. This, of course, refers to a shift in the conceptual framework of the individual, but when this sort of shift occurs in the framework of several individuals in a community, it thereby assumes a social dimension as well.⁹

In discussing the gestaltic nature of such changes in conceptual commitments, Kuhn writes:

Looking at the moon, the convert to Copernicanism does not say, "I used to see a planet, but now I see a satellite." That locution would imply a sense in which the Ptolemaic system had once been correct. Instead, a convert to the new astronomy says, "I once took the moon to be (or saw the moon as) a planet, but I was mistaken." (Kuhn 1996:115)

Understandably, this period of revolution can create a most interesting social and intellectual environment, for scientists who previously shared a perspective are no longer seeing the world through the same lenses. The manner in which scientists evaluate paradigms is a source of much debate in the philosophy of science. The present discussion will not attempt to summarize that debate. However, it is important to point out that the process is the basis of Kuhn's *incommensurability hypothesis*.¹⁰

Kuhn argues that, even if an observer *could* gain a neutral position, it would be difficult and rarely productive to compare paradigms, for they stem from differing underlying presuppositions about the subject of inquiry and sometimes the method of science itself (1996:147-150, 198-204). When the differing paradigms represent the effect of scientific revolution, resistance is expected, for as Kuhn expresses it, "what were ducks in the scientist's world before the revolution are rabbits afterward" (1996:111). Even though the languages of competing paradigms may sound similar, the proponents intend different things through their use (1996:149). Kuhn suggests that, instead of debate, the participants in such communication breakdown can, at best, "recognize each other as members of different language communities and then become translators" (1996:202). It should be noted, however, that in Kuhn's view, incommensurability prevents the process of translation from ever yielding complete communication. Nevertheless, by approximating such communication, and repeating the effort in various ways, the

members of various communities may help to bring about a gestalt-switch experience (see Borradori 1994:161-165).¹¹ He writes:

To translate a theory or worldview into one's own language is not to make it one's own. For that one must go native, discover that one is thinking and working in, not simply translating out of, a language that was previously foreign. That transition is not, however, one that an individual may make or refrain from making by deliberation and choice, however good his reasons for wishing to do so. Instead, at some point in the process of learning to translate, he finds that the transition has occurred, that he has slipped into the new language without a decision having been made. Or else, like many of those who first encountered, say, relativity or quantum mechanics in their middle years, he finds himself fully persuaded of the new view but nevertheless unable to internalize it and be at home in the world it helps to shape. Intellectually such a man has made his choice, but the conversion required if it is to be effective eludes him. ... for he lacks the constellation of mental sets which future members of the community will acquire through education. (Kuhn 1996:204)

Of the process of paradigm evaluation and its relationship to the incommensurability problem, Kuhn writes:

It makes a great deal of sense to ask which of two actual and competing theories fits the facts *better*. ... This formulation, however, makes the task of choosing between paradigms look both easier and more familiar than it is. If there were but one set of scientific problems, one world within which to work on them, and one set of standards for their solution, paradigm competition might be settled more or less routinely by some process like counting the number of problems solved by each. But, in fact, these conditions are never met completely. The proponents of competing paradigms are always at least slightly at cross-purposes. Neither side will grant all the non-empirical assumptions that the other needs in order to make its case. ... they are bound partly to talk through each other. Though each may hope to convert the other to his way of seeing his science and its problems, neither may hope to prove his case. The competition between paradigms is not the sort of battle that can be resolved by proofs. (Kuhn 1996:147, 148)

4.1.9 The conceptual arrangement of paradigms

Related to the misconception that by 'paradigm' Kuhn intended only "Grand Theories" is a common neglect of Kuhn's suggestion that paradigms are to some extent both hierarchically ordered and arranged via network-like connections (1996:40-42). Kuhn's suggestions in this regard are not explicitly stated in the 1962 edition, instead they

are embedded in the broader discussion of rules and the various uses of the term paradigm (1996:41-43). Kuhn's 1970 Postscript elaborates on the issue somewhat in discussing the "numerous levels" of community structure and the usage of terms (1996:177, 181).

It is significant that Kuhn chose the word 'constellation', defining 'paradigm' as a "constellation of group commitments" (1996:181). In contrast to the simpler terms "set" and "body," which Kuhn could have employed in referring to group commitments, the term constellation evokes the idea of configuration, pattern, and arrangement. Commitments to the disciplinary matrix are related and arranged; they are not simply a loose set thrown together in a haphazard manner. When hierarchical relationships are considered, the connections and dependent relationships between various theories and models employed by a discipline become more clear. We speak of lower level conceptual 'paradigms' (i.e., commitments to respective theories and other components of the disciplinary matrix) as they are currently unfolding and being developed. But at another level of investigation are superior-level 'paradigms', the commitments to collected (though not always formalized) presuppositions (i.e., metatheory) under which a discipline is united, those collections of assumptions which more obviously relate to a shared ontology (see Edmondson and Burquest 1998:13).

The concept of hierarchical ordering and conceptual relationship is crucial to the question of commensurability. Concepts which are hierarchically ordered are, in that sense, both related and structurally dependent. That is, the more specific level nodes can be said to be accountable to and comparable under the higher level nodes in the hierarchy. Paradigms which are ordered in such an *arboreal* fashion, (i.e., branching from a major "trunk") do have a level of commensurability under shared nodes, but are incommensurable between nodes of the same level or between inferior and superior levels. (See figure 4.2.)

This is the basis of the common “apples and oranges” fallacy in argumentation. It is possible to discuss how two specific level units are related under a shared generic node. But it would be irrational to evaluate a specific unit on the basis of its conformity to another specific unit, and vice versa. That is, it would be irrational to criticize an orange for being a poor representation of an apple. Criticisms of this type typically involve elevation of the specific criteria to the level of genus, followed by a criticism of other specific units for their failure to conform to the elevated unit. In the fruit example, the apple (species) has been made the standard fruit (genus level), by which all other fruits (species level) are measured. Of similar error is the practice of evaluating the status of a generic category on the basis of its conformity to a specific unit. That is, the notion of fruit (genus) is criticized for being too vague; the notion of fruit, it is argued, should be more orange-like.

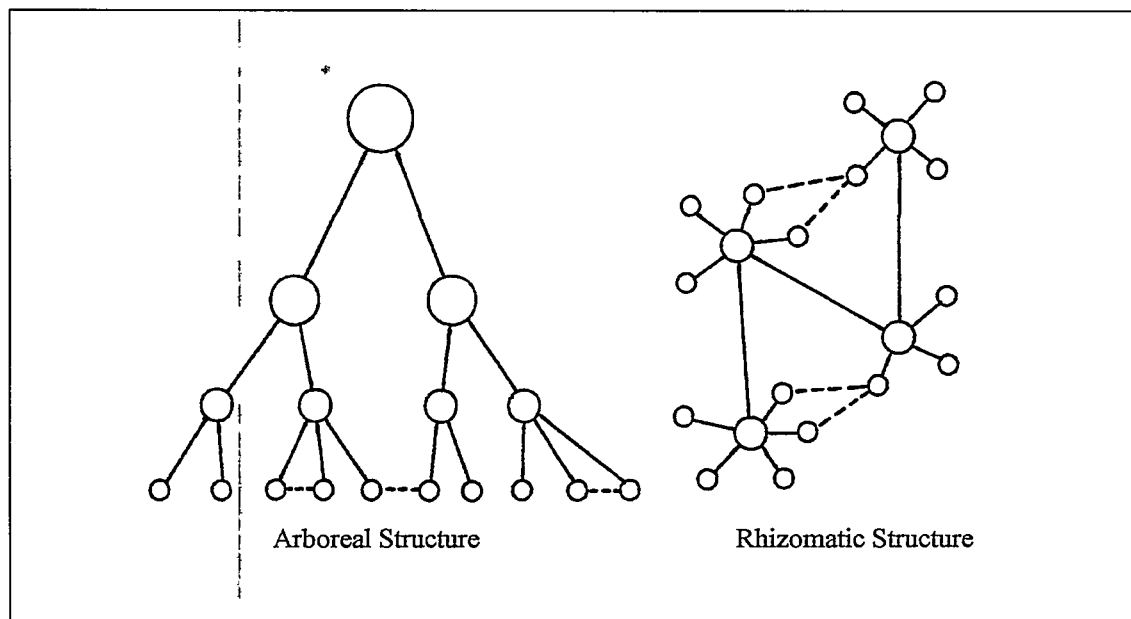


Figure 4.2. Diagrammatic representation of arboreal and rhizomatic ordering of paradigmatic relationships.

These logical limitations of argumentation do not, however, suggest that one cannot or should not *prefer* theoretical apples over theoretical oranges, or oranges over apples, especially when a particular function is involved or characteristic is required. They may be equal in *status*, but are obviously distinct in *content*.

Paradigms which are conceptually related, but less hierarchically ordered, can be viewed as having *rhizomatic* connections (i.e., not sharing a single “trunk,” but nevertheless related in various ways).¹² They are ordered and related, but their higher level nodes are related serially, rather than hierarchically. The higher level nodes are also typically fewer in number and are often not explicitly addressed or formalized. Comparing such paradigms is less easy and is often less productive, for they share fewer presuppositions. (See again figure 4.2.)

It would be rare, of course, for paradigmatic relationships to exclusively follow one or the other of these two patterns. After all, paradigms only exist via the belief and practice of humans in community, and humans rarely isolate themselves to the extent necessary for purely arboreal relationships to develop. As the diagrams indicate with dashed lines, “limbs” within either type of structure may be related or “grafted” horizontally, yielding a complex set of relationships. But even with horizontal grafts in place, the arboreal structure still differs significantly from the rhizomatic structure in the fact that all of the arboreal limbs share a dependence upon major limbs and a common trunk. If an analyst fails to recognize the significance of these basic level nodes, then the arboreal structure may be misinterpreted as a rhizomatic structure. In such a misinterpretation the analyst has observed the “tree” as if from its top. The density and complexity of its more specific limbs then obscure his view of the basic-level limbs and trunk which unite the structure as a whole.¹³

The question of commensurability is also tied to the strength of an individual's and group's conceptual commitments. If an individual is strongly committed to a particular disciplinary matrix or paradigm community, then he or she is likely to find it difficult to consider the position proposed under an alternative paradigm. But if a researcher has no commitments or only weak commitments to the disciplinary matrix or communities involved, then he or she may more readily give alternative arguments equal consideration.

Within paradigm communities, a degree of receptivity is often practiced in consideration of sibling terminal nodes in a hierarchy, but is less common in comparisons of higher-level nodes or terminal nodes that do not share a close genetic relationship. The higher the nodes concerned in the comparison, the more abstract are the commitments being questioned. An individual may be cognizant of his commitments to a theory, but his commitments to a metatheory are more abstract, and therefore more elusive. And this, of course, contributes to incommensurability. As philosopher Ian Barbour has suggested, "There can be complementary models [and theories] within [the disciplinary matrix of] a paradigm, but paradigms are evidently not complementary; a person can fully share the outlook of only one tradition at a time" (1974:147).

There are advantages to Kuhn's having redescribed 'paradigm' as commitment to a disciplinary matrix. For example, identification of the various elements of the matrix (symbolic generalizations, models, values, and exemplars) helps to facilitate a more detailed examination of how particular paradigms are related. Paradigms may not be complementary, but that does not mean that the respective elements in the disciplinary matrices are the exclusive "property" of individual paradigms. While Kuhn does not address such "element sharing" specifically, he does allude to it in discussing the 'values' component, stating that values are "more widely shared among different communities than either symbolic generalizations or models" (Kuhn 1996:184).

4.1.10 Objectivity versus intersubjectivity

Kuhn notes that many of his critics have inaccurately charged him with teaching subjectivity and irrationality. He offers the following objection:

Some readers have felt that I was trying to make science rest on unanalyzable individual intuitions rather than on logic and law. But that interpretation goes astray in two essential respects. First, if I am talking at all about intuitions, they are not individual. Rather they are the tested and shared possessions of the members of a successful group, and the novice acquires them through training as a part of his preparation for group-membership. Second, they are not in principle unanalyzable. (Kuhn 1996:191)

Kuhn is not suggesting that science is a practice in subjectivity, but rather, that it involves intersubjectivity. This is, of course, in contrast to some who would argue that science is or can be objective.

Obviously Kuhn has joined an age-old debate. Rudolf Flesch anecdotally highlights the crux of that debate:

There is a little book on my shelves that contains a set of rules for thinking. Rule Number One reads: "Define the primary facts in connection with your observation, and separate these facts from any opinions or impressions." An excellent rule—except for one little thing: it can't be done. (Flesch 1951:26)

Kuhn suggests that the perceptions of the individual cannot be objective in any absolute sense, for no observations exist independently of opinion or impression. But his position should be seen as contrasting with the historically common position held by subjectivists. Whereas subjectivists would argue that each perception is individually derived, and therefore subjective, Kuhn emphasizes that perception is not purely individual, rather, perception is largely conditioned through interaction with the group. For those working *within* the group, observations may appear to be objective. This is because presuppositions driving those observations are largely shared, and because of the absence of alternative presuppositions. However, observations gathered by one paradigm community commonly diverge from those gathered by another. (This is, of course, a

fundamental issue in Kuhn's position on incommensurability, to be discussed in section 4.1.8.)

Without the notion of a paradigm (or something of that sort), one might be required to choose between the poles of objectivity and subjectivity. If science is *objective*, then there is difficulty accounting for competing theories or the fact that theories seem to have a "half-life." If science is *subjective*, then there is difficulty accounting for the myriad sensations which seem to be shared by a group of scientists, shared experiences which allow them to communicate and work together.

Obviously the world of science is neither entirely objective nor entirely subjective. The concept of intersubjectivity and 'paradigm' serves to explain how intra-group activity can have the appearance of objectivity, while inter-group comparisons suggest subjectivity.¹⁴

4.1.11 The idea of progress

On a similar note, Kuhn has expressed dismay that some of his critics accuse him of destroying the notion of progress in science. To the extent that this has occurred, it reflects the influence of Kuhn's overzealous readers, rather than direct influence on his part. For example, in an interview with John Horgan, Kuhn relates "a painful memory of sitting in on a seminar and trying to explain that the concepts of truth and falsity are perfectly valid, and even necessary—within a paradigm." But the host professor was not convinced—not even by Kuhn himself. He finally looked at Kuhn and, speaking of *Structure*, said, "Look, you don't know how radical this book is" (Horgan 1996:45).

While some of his disciples may have taken such a radical position, Kuhn himself seems to have held to the idea of progress, at least as progress continues through the work of normal science. Consider, for example, the following:

Ask now why an enterprise like normal science should progress, and begin by recalling a few of its most salient characteristics. Normally, the members of a mature scientific community work from a single paradigm or from a closely related set. Very rarely do different scientific communities investigate the same problems. In those exceptional cases the groups hold several major paradigms in common. Viewed from within any single community, however, whether of scientists or of non-scientists, the result of successful creative work *is* progress. How could it be anything else? (Kuhn 1996:162)

Kuhn argues that scientists and non-scientists *do* “contribute to progress, if only to that of the group that shares [a set of] premises” (Kuhn 1996:162) This is the crux of Kuhn’s argument regarding progress. He continues:

If we doubt, as many do, that non-scientific fields make progress, that cannot be because individual schools make none. Rather, it must be because there are always competing schools, each of which constantly questions the very foundations of the others. ... These doubts about progress arise, however, in the sciences too. Throughout the pre-paradigm period when there is a multiplicity of competing schools, evidence of progress, except within schools is very hard to find. This is the period described ... as one during which individuals practice science, but in which the results of their enterprise do not add up to science as we know it. And again, during periods of revolution when the fundamental tenets of a field are once more at issue, doubts are repeatedly expressed about the very possibility of continued progress if one or another of the opposing paradigms is adopted. (Kuhn 1996:162-163)¹⁵

Kuhn later adds, “With respect to normal science, then, part of the answer to the problem of progress lies simply in the eye of the beholder” (Kuhn 1996:163).

In its normal state, then, a scientific community is an immensely efficient instrument for solving the problems or puzzles that its paradigms define. Furthermore, the result of solving those problems must inevitably be progress. There is no problem here. Seeing that much, however, only highlights the second main part of the problem of progress in the sciences. Let us therefore turn to it and ask about progress through extraordinary [(i.e., revolutionary)] science. Why should progress also be the apparently universal concomitant of scientific revolutions? (Kuhn 1996:166)

In reply, Kuhn argues that it need not. In the course of a paradigm shift, one of the paradigms must necessarily win out over the other. From the perspective of the “winners,” progress has been made. As Kuhn suggests, “Will that group ever say that the result of its victory has been something less than progress? That would be rather like admitting that

they had been wrong and their opponents right” (Kuhn 1996:166) But Kuhn continues, pointing out that such new communities invariable rewrite this history of the discipline they now dominate:

When it repudiates a past paradigm, a scientific community simultaneously renounces, as a fit subject for professional scrutiny, most of the books and articles in which that paradigm had been embodied. Scientific education makes use of no equivalent for the art museum or the library of classics, and the result is sometimes a drastic distortion in the scientist’s perception of his discipline’s past. More than the practitioners of other creative fields, he comes to see it as leading in a straight line to the discipline’s present vantage. *In short, he comes to see it as progress.* No alternative is available to him while he remains in the field. (Kuhn 1996:167; italics added)

Kuhn also writes, “There are losses as well as gains in scientific revolutions, and scientists tend to be peculiarly blind to the former” (Kuhn 1996:167). In an illuminating footnote to this sentence, Kuhn adds:

Historians of science often encounter this blindness in a particularly striking form. The group of students who come to them from the sciences is very often the most rewarding group they teach. But it is also usually the most frustrating at the start. Because science students “know the right answers,” it is particularly difficult to make them analyze an older science in its own terms. (Kuhn 1996:167, n. 3)

In summary, Kuhn conceives of that progress as being punctuated by revolutionary periods, in which revolutionary science *redefines* the direction and goal of a discipline’s notion of progress. As such, revolution “is a destructive as well as a creative act” (Horgan 1996:43). Kuhn has “denied that science is constantly approaching truth. At the end of *Structure* he asserted that science, like life on earth, does not evolve *toward* anything, but only *away* from something,” namely, its former state of being and definition (Horgan 1996:43-44). Kuhn is simply suggesting that the interests, goals, and applications of sciences are contingent. They may remain relatively stable for a period of time, but they are subject to change.

4.2 Critiques within linguistics

This section addresses several critiques of Kuhn's theory offered within the linguistic literature, including critiques addressing how Kuhn's theory may be employed in an account of the history of linguistics.

4.2.1 Linguistics and Kuhn's two major senses of 'paradigm'

As has been mentioned, the polysemy with which Kuhn employed the term 'paradigm' in his 1962 text contributed to confusion regarding his thesis. In his 1970 Postscript, Kuhn attempted to "rein in" the various senses of the term, keeping and elaborating upon two senses:

[A] On the one hand, it ['paradigm'] stands for the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community (Kuhn 1996:175).

[B] On the other, it denotes one sort of element in that constellation, the concrete puzzle-solutions which, employed as models or examples, can replace explicit rules as a basis for the solution of the remaining puzzles of normal science. (Kuhn 1996:175)

In the context of a response to Makkai (1975), James McCawley (1979 [orig. 1976]) makes a noble effort to untangle Kuhn's infamous 1962 polysemy regarding the term 'paradigm'.¹⁶ In some areas McCawley seems to have accurately interpreted and paraphrased Kuhn for his audience of linguists, but in others he neglects key points, sometimes overlooking important implications of Kuhn's theory. In his defense, it should be noted that McCawley does offer a disclaimer of sorts, noting that his representation may not be exactly what Kuhn intended.

Much of McCawley's difficulty seems to stem from the fact that he only references the 1962 edition of *Structure* and does not seem to have synthesized the 1970 Postscript material.¹⁷ He writes:

The sense of 'paradigm' that will be most important in the discussion below is what a linguist might describe as a set of 'markedness principles'. At any time, in any scientific community, there are certain factual and theoretical claims and approaches to the solution of problems which have acquired such prestige and/or wide acceptance that members of the community feel free to employ them without offering further justification for them. ... These claims and approaches are 'unmarked', as contrasted with 'marked' claims and approaches ...; a person presenting a paper at a meeting cannot just assume 'marked' claims or approaches but must also defend them, or at least, he must if he is to retain his standing as a member of the community and not acquire the reputation of a gate-crasher or a crackpot. (McCawley 1979:224)

For linguists invariably familiar with the notion of markedness, this analogy is indeed a useful characterization of how scientific communities may regard divergent paradigms. But, as do others who quote only from Kuhn 1962, McCawley too easily equates 'paradigm' with 'theory', while missing the idea of conceptual *commitments* and the roll of shared examples as Kuhn highlights in his 1970 Postscript. This is unfortunate for McCawley's readers, who may themselves be ill acquainted with Kuhn. In missing Kuhn's Postscript, McCawley seems to suggest that a paradigm is simply a body of shared knowledge. Unfortunately, this oversight deleteriously affects his use of Kuhn's theory. He writes:

A paradigm need not even be consistent: several mutually inconsistent approaches may each have achieved sufficient status with a scientific community that any may be adopted without further ado.

Within any scientific community there are likely to be subcommunities which have different markedness principles than the whole community does. This will almost certainly be the case whenever the large community has an *inconsistent paradigm* A person can thus recognize a proposition as part of the paradigm of a community to which he belongs even though he does not accept that proposition himself. (McCawley 1979:225, italics added)

One may conjecture that McCawley considers the linguistic community to exhibit such an inconsistent paradigm. Whatever the case, in this comment McCawley makes a useful observation, but a somewhat flawed synthesis of Kuhn's material. While he is obviously addressing the phenomenon of subcommunities, he neglects to note that the conceptual elements in the larger paradigm are hierarchically ordered, whereby

subcommunities may share a superior level paradigm while maintaining distinct lower level paradigms. The higher level paradigm is not "inconsistent." Rather, it is simply *undefined* in regard to lower level concerns, similar to the way that "animal" is undefined in terms of the lower level exemplars: dog, cat, deer, antelope, and so forth. In his overlooking such hierarchical structure, McCawley's readers may draw the implication that theories are all related at a single level. A similar implication may be drawn regarding subcommunities.

Following upon Makkai (1975), McCawley offers an analogy for paradigm shift, which, like his markedness analogy, does prove useful, if only in part. McCawley suggests that investment in a new paradigm is reminiscent of investing capital in a market economy:

In summary, to win an adherent to a new idea, you must convince him that the expenditure of intellectual capital that is involved in his adopting the idea will pay off in the things that matter to him. (McCawley 1979:227)

He does not stop there, however, but continues with an earlier criticism regarding a common misuse of Kuhn by latent cumulativists:

There is a deplorably common tendency to form an unholy synthesis of Kuhn's notion of revolution with the previously standard view that science develops cumulatively,¹ which yields the popular but totally unwarranted view that scientific revolutions are always for the better. I note in passing that Chomsky's conception of the history of linguistics commits him to a view that there have been scientific revolutions for the worse in linguistics and psychology (e.g., the 'neogrammarian revolution' and the 'behaviorist revolution'). (McCawley 1979:223)

Unfortunately, his polemics threaten to overshadow certain vital questions. He writes:

I have espoused propositions that seem to be leading me toward Makkai's conclusion that advertising in scientific communities may be particularly pernicious and may result in scientific conclusions for the worse. ... The market for ideas has a pretty bad record as far as markets go. It is much easier to find revolutions for the worse in the market for ideas than in the markets for mundane things like writing instruments; there is no instance that I know of in which one type of writing instrument has supplanted another in which the new

writing instrument did not enable people to do more writing, do it faster, and do it more cheaply.

I think that suckers do get fleeced worse in the market for ideas than in the market for writing instruments. However, most of the wrath that this idea stimulates in me is directed not against the swindlers but against the suckers. Scientific communities get the scientific revolutions that they deserve. The members of a scientific community are in the business of acquiring and refining knowledge, and they thus ought to be adept at evaluating claims. If the community is filled with persons who have little awareness of the implications of their supposed knowledge and little concern with the critical evaluation of other ideas, people who are willing to invest their intellectual capital on a scientific vehicle that they haven't given a thorough test-drive, then the community is in bad shape: it is in serious danger of mass investment of its collective intellectual capital on worthless projects. However, if a community is in that bad shape, its members can't have all that much intellectual capital to be bilked out of. ... In the case of a healthy scientific community, irresponsible advertising is likely to be ineffective, since the community will be full of people adept at detecting its irresponsibility. (McCawley 1979:231-232)

Unfortunately, McCawley is handling the social function of paradigm communities in a perfunctory manner. While he laments the fact that Kuhn did not adequately address the role of scientific communities in his 1962 edition, he has overlooked Kuhn's discussion of such community structure and function in the 1970 Postscript (see Kuhn 1996:176-181). He has also overlooked the role such a community serves in *training* the student scientist to see the world through a particular paradigmatic "lens."

Most students learn a normal science paradigm as an orthodox unit and rarely question its presuppositions. They are fed only one paradigm, and are thereby ill equipped to make the sort of comparative investigation for which McCawley argues. Notions of inferiority are relative and typically have a directional bias. Students who "grew up" under a particular paradigm typically favor that paradigm by default, regardless of what other paradigms may surface. (Kuhn would argue that the comparison of paradigms is not entirely possible anyway.) Discussing the manner of instruction typically employed in the natural sciences, Kuhn writes:

In these fields [i.e., the natural sciences] the student relies mainly on textbooks until, in his third or fourth year of graduate work, he begins his own research. Many science curricula do not ask even graduate students to read in

works not written specially for students. The few that do assign supplementary reading in research papers and monographs restrict such assignments to the most advanced course and to materials that take up more or less where the available texts leave off. Until the very last stages in the education of a scientist, textbooks are systematically substituted for the creative scientific literature that make them possible. *Given the confidence in their paradigms, which makes this educational technique possible, few scientists would wish to change it. ... Of course, it is a narrow and rigid education, probably more so than any other except perhaps in orthodox theology. But for normal-scientific work, for puzzle-solving within the tradition that the textbooks define, the scientist is almost perfectly equipped.* Furthermore, he is well equipped for another task as well—the generation through normal science of significant crises. When they arise, the scientist is not, of course, equally well prepared. (Kuhn 1996:165-166; italics added)

Of course McCawley's terms "bad" and "good," "bad shape" and "healthy" lack definition. More significant questions arise where McCawley neglects the role of normal science in defining the orthodox. In regard to buying into a new paradigm, the decision to switch depends largely upon the sort of needs and questions felt. If a scientist has fruit salad in mind, he might argue that apples are a better fruit than avocados. Another scientist, who has guacamole in mind, argues in favor of avocados. If the first scientist considers his science to be in the business of fruit salad, then, as he sees it, the second scientist has bought into a "bad" paradigm. Obviously she is in "bad shape" and lacking in "intellectual capital." Of what use is guacamole when fruit salad is so obviously the goal? The shortcoming in this portion of McCawley's critique is rather simple. As Kuhn himself puts it, "Each group uses its own paradigm to argue in that paradigm's defense" (Kuhn 1996:94; also see 92ff).

From our current perspective it would be easy, albeit absurd, to regard our forebears in the sciences with the comment, "Those stupid people! They actually believed that the earth was flat!" But with hindsight we may note that the flat-earth community *was* the dominant community, and members of that community were *convinced* that the round-earth community was buying into an inferior paradigm. If they want to believe the earth is

round, then let them have it. After all, "scientific communities get the scientific revolutions that they deserve" (McCawley 1979:231).

The preceding comments notwithstanding, McCawley's investment analogy is useful. It can indeed be difficult to determine exactly how a community (or individual) should invest "intellectual capital." Kuhn himself notes: "During periods of revolution when the fundamental tenets of a field are once more at issue, *doubts are repeatedly expressed about the very possibility of continued progress* if one or another of the opposed paradigms is adopted" (Kuhn 1996:163; italics added). If an analyst is satisfied with a paradigm, he may feel no need to abandon it. If others around him do feel such a need and abandon the earlier paradigm in favor of another, then from the perspective of the first individual, they have abandoned logic for illogic and the orthodox for heresy.

McCawley posits the inverse of the cumulativists' presupposition. Whereas cumulativists posit that paradigm shift brings about a successive move toward scientific progress, he posits that it may be a move *away* from such progress. He has taken the antithetical position, but has made a similar error. The primary issue remains: How might one find a neutral position from which to make the evaluation? Obviously that position would require an objective stance. Kuhn offers little assistance here, arguing that, since paradigms are being evaluated by practitioners of paradigms, inherent biases can never be totally overcome (1996:92-94). This is clearly a circular response. Kuhn is not unaware of the circularity, and he attributes it to the nature of disciplinary communities in question. Since such communities define their own favorite problems, they may thereby insure that their favored paradigm always "comes out on top."

McCawley is primarily concerned with questions of productivity. In other words, should we abandon one treatment in favor of another before we have completed the first treatment? It may be an interesting question, but it fails to grasp Kuhn's argument:

Science is not completely objective. If it were, then questions of productivity would be paramount and, it should be added, simple to answer. Is this to suggest that Kuhn is *not* interested in productivity? The answer is twofold. As addressed in section 4.1.11, Kuhn does support the idea of progress as it has been conceived within normal science, but, he also notes that the traditional characterization simply does not hold across scientific revolutions. In the process of revolution, a community may redefine the very notion of progress, so that progress expresses the presuppositions of the new paradigm, rather than the old.

4.2.2 Linguistics and Kuhn's notion of a disciplinary life-cycle

Kuhn's idea of a disciplinary life-cycle was better developed in his 1970 Postscript than it had been in the earlier text. Accordingly, in reading linguists responding to Kuhn, it is important to note which text they reference. Kuhn's 1962 edition suggested that disciplines typically go through a period in which they grapple with several potential paradigms, prior to seizing upon a single paradigm. In that discussion, the earlier phase was described as being "immature" and "pre-paradigm," while the later was characterized as "mature." But as is recounted in section 4.1.7, Kuhn revised and clarified that position, largely in response to critics, who correctly pointed to its inadequacy. As he explained, "What changes with the transition to maturity is not the presence of a paradigm but rather its nature" (Kuhn 1996:179).

While linguists may readily recognize in other disciplines the life-cycle Kuhn describes, the manner in which they interpret the history of their own discipline varies. Some linguists have found in Kuhn's concept of revolutions and paradigm shift an explanation for particular characteristics of the "Chomskian revolution" and the relative dominance the generative school has held within the linguistic community (see Grace

1969, Lounsbury 1961, Pearson 1977, Thorne 1965, Voegelin and Voegelin 1963, Wells 1963). Others concede that the advent of the generative school was revolutionary, but having noted certain similarities between the generative conceptual framework and frameworks that predate it, they suggest that the revolution was more social than conceptual (see Anttila 1975, 1993).¹⁸

Certain other linguists have responded to Kuhn in a different manner. They share the general perspective that major linguistic schools of thought, such as the structural, behavioral, generative, stratificational, and functional traditions, can be viewed as coexisting paradigms (Edmondson and Burquest 1998, Figueroa 1994, Hymes 1974a, Percival 1976). These theoreticians implicitly or explicitly reject components of Kuhn's theory as it applies to the conceptual structuring of disciplines. For example, Hymes (1974a), Percival (1976), and Figueroa (1994) argue that, in contrast to Kuhn's predictions regarding the development and structuring of disciplines around a dominant paradigm, linguistics has had no major paradigm and that, instead, several paradigms have existed and been maintained in a coincidental and continually competitive state. Figueroa makes her rejection explicit, stating, "Kuhn's scheme does not adequately account for the history of linguistics where one finds *throughout* its history, co-existence of competing paradigms" (1994:8; italics added). Instead, she prefers Hymes' assessment of the history of linguistics, wherein Hymes proposes the notion of cynosures within a diverse paradigmatic community (Figueroa 1994:8, 9, Hymes 1974a:1-38).¹⁹

Percival (1976) and Figueroa (1994) both take issue with Kuhn's account of the developmental processes in disciplinary science, suggesting that they don't apply to linguistics. Of major concern for these theoreticians is Kuhn's suggestion that scientific disciplines typically begin with what he termed an "immature" state, wherein competing paradigms vie for position. "Mature" disciplines, in contrast, have progressed through this

phase and are typically united under a single paradigm (see section 1.1.3). Percival and Figueroa reject Kuhn, arguing that coexisting paradigms in linguistics negate the validity of his theory.

Their arguments are not convincing. "Paradigms" they identify are, in fact, unified in a higher-level paradigm (i.e., commitment to particular metatheory) of linguistics. If they are to be characterized as paradigms, it should be as subcommunity-level paradigms centered on particular theories. But even if their characterization of linguistics was accepted, it would pose no counter-argument—the coexistence of paradigms presents no problem within Kuhn's theory. Percival acknowledges this, but finds Kuhn's account dissatisfying: "If it is easy, as Kuhn asserts, to identify the paradigms of a mature scientific community, then we must indeed conclude that, from its inception, modern linguistics has not been a science—or more precisely, that modern linguistics has not been one of Kuhn's 'mature sciences'" (Percival 1976:291). Figueroa concurs, "Of course in Kuhn's defense one could simply claim that linguistics is and always has been an 'immature' science, hence the existence of various approaches at any given time" (Figueroa 1994:8).

Percival's and Figueroa's rejections of Kuhn extend, in part, from an overreaction to his dichotomization of 'mature sciences' and 'immature sciences' and, more generally (at least for Percival), the dichotomization of 'sciences' and 'non-sciences'. Both of these dichotomies, it should be noted, depend upon a categorization which divides disciplines supporting a plurality of paradigms from those disciplines hosting a dominant individual paradigm (see Percival 1976:291, 292; also see Kuhn 1969, Masterman 1970:74).²⁰ Kuhn himself acknowledges this as a problem in the preface to his 1962 text, stating, "My distinction between the pre- and the post-paradigm periods in the development of a science is ... much too schematic" (1996:ix). These dichotomies *are* overly simplistic, but

if viewed as simple heuristic devices, they pose no threat to the general value of Kuhn's theory. This is especially so if one considers the modifications and elaboration offered by Kuhn in the 1970 Postscript.

Percival also gives considerable attention to rejecting a Kuhnian account of the early history of linguistics. Based on his historical review, which depends heavily on Hymes (1974a), Percival's rejection of a Kuhnian account seems rather pedantic. He insists that, in order for Kuhn's account to have any value for linguistics, one must be able to identify lone innovators as responsible for a paradigm, those innovators should have no antecedents, and the communal switch to the new paradigm should be both quick and complete (1976:290, 291). While Kuhn did, in fact, identify such elements in certain paradigm shifts of the past, he does not insist that these characteristics are essential. He writes, "The most obvious of scientific revolutions are those famous episodes in scientific development that have often been labeled revolutions before" (1996:6). In introducing the idea of revolutions through the work of Copernicus, Newton, Lavoisier, and Einstein, he states, "More clearly than most other episodes in the history of at least the physical sciences, these display what all scientific revolutions are about" (Kuhn 1996:6). Elsewhere he writes, "I have so far tried to display revolutions by illustration, and the examples could be multiplied *ad nauseam*. ... [The examples used] were deliberately selected for their familiarity" (1996:136). In other words, Kuhn clearly did *not* choose these particular revolutions as illustrations because their concise and colossal qualities are normative, but rather because those exceptional and famous qualities make them convenient and easy to discuss. Moreover, he points to the existence of such changes at both macro and micro levels, thereby illustrating that he is not referring only to paradigms which act as Grand Unified (or unifying) Theories. Kuhn writes:

Characteristics [of paradigm shift] emerge with particular clarity from a study of, say, the Newtonian or the chemical revolution. It is however, a fundamental

thesis of this essay that they can also be retrieved from the study of many other episodes that were not so obviously revolutionary. For the far smaller professional group affected by them, Maxwell's equations were as revolutionary as Einstein's, and they were resisted accordingly. (Kuhn 1996: 6-7)

In regard to Percival's insistence that a Kuhnian account demands 'lone innovators' and immediate communal response (see Percival 1976, n. 11), Kuhn seems to suggest just the opposite as the more normative condition, even within his 1962 text:

A new theory, however special its range of application, is seldom or never just an increment to what is already known. Its assimilation requires the reconstruction of prior theory and the re-evaluation of prior fact, an intrinsically revolutionary process that is seldom completed by a single man and never overnight. No wonder historians have had difficulty in dating precisely this extended process that their vocabulary impels them to view as an isolated event. (Kuhn 1996:7)

In a footnote to his 1979 version of *Madison Avenue, si, Pennsylvania Avenue, no!*, McCawley similarly addresses concerns raised by Percival (1976).²¹ He writes:

Percival (1976) argues that Kuhn's notion of paradigm "cannot be applied either to the history or the present state of linguistics." However, Percival's arguments are concerned with two features of Kuhn's conception of paradigm that I regard as peripheral to Kuhn's main claims, namely, Percival's view of a paradigm as "(1) resulting from an outstanding scientific achievement on the part of a single innovator, and (2) commanding uniform assent among all the members of the discipline" (Percival 1976:285). The question of where the ideas embodied in a paradigm come from is clearly immaterial to the question of how a set of ideas and approaches acquires the status of a paradigm. The existence of a single innovator (or of someone who can be palmed off as a single innovator) is a propagandistic asset that has undoubtedly helped various paradigms to acquire paradigm status faster than they otherwise would have, but Percival's first point is at best a side issue. Furthermore, uniform assent among the members of a discipline is neither necessary nor sufficient in order for an idea to be part of a paradigm for that discipline. An idea or approach is part of the paradigm of a discipline if it is uniformly regarded as the 'standard' answer to certain questions or the standard way of dealing with certain kinds of problems, even by members of the discipline who regard the answer as wrong or the method as unsound. (McCawley 1979:279)

Dell Hymes' argument regarding cynosures is related to that offered by Percival, but is a bit more complex and subtle (Hymes 1974a:1-38). Hymes (1974a) is the introductory article in a collection of works titled *Studies in the History of Linguistics:*

Traditions and Paradigms. Hymes correctly notes that linguistics has witnessed the coexistence of competing schools of thought, and that no single school has ever completely displaced the others. Rather, the discipline has simply made one or another of the schools the focus of attention for a time. Then, when interest shifts to another set of problems and questions, attention correspondingly shifts to a different school of linguistics.

With this history in view, Hymes suggests that Kuhn's theory does not sufficiently account for linguistics since, in his perspective, the community seems to lack the level of conformity or unity he understands Kuhn to be describing. Accordingly, Hymes is not satisfied with the notion of paradigms as he understands it to apply to linguistics. He suggests that the history of linguistics may be better characterized by the term (and notion) of *cynosures*. (Cynosure may be defined as "a center of attention or interest" –Neufeldt 1989.)

In contrast to Percival (1976), who makes bold statements that are easily contrasted with Kuhn's writings, Hymes makes no clear argument with Kuhn. He does not quote Kuhn in the article, preferring instead to loosely summarize. One comes away with a general sense that Hymes disagrees with Kuhn, particularly in regard to how Kuhn may be applied to linguistics, but there is no clear point of contention. He simply implies that Kuhn's theory may be a better fit for the hard sciences, such as physics and chemistry, than it is for the human sciences, such as linguistics. Indeed, Hymes' contention may not be with Kuhn so much as it is with those who would attempt to apply Kuhn to linguistics.

Hymes seems particularly concerned with ways in which Kuhn's theory may have biased linguists' reviews of linguistic history and influenced their anticipation of the future of linguistics. He suggests that Kuhn's notion of paradigms has "encouraged a bias of practicing linguists toward their own history ... in favor of a picture of their

discipline's history as one of great gaps and discontinuities, and, as far as the history informs the present and future, toward an image of 'permanent revolution'" (Hymes 1974a:14). Hymes is particularly critical of "ways in which the notion of 'paradigm', as an implicit theory of the nature of science and scientific progress, may be used as a *scenario*" (1974a:14, and forward; italics added). That is, he is concerned about characterizations which would cast every arriving new theory as a Kuhnian revolution, with rising theoreticians casting themselves in the role of "Chomsky II (or III or IV)" (1974a:17).

Hymes has raised a valid concern; however, it is not well balanced by the conclusion to the section, wherein he employs loaded language to disparage the argument (see Weston 1992). Hymes *insists* that the past history of linguistics can only be understood via his characterization, and implies that those who would disagree with that characterization are naively biased by their subcommunity and inadequately informed (1974a:19-20; also see Hymes and Fought 1975:925). Having mentioned the possibility of a linguistics which is "pluralistic in ideal and in practice," he writes:

Such a perspective is at least clearly required for the understanding of the past development of linguistics. It is[,] to repeat, not adequately understood as a succession of *paradigms*. Rather, it has had a history of the rise, and variegated development, of a plurality of *traditions*. These traditions of inquiry, sets of problems, have each their own record of continuity in and of themselves. In relation to the center of the intellectual or disciplinary stage, to the succession of *cynosures*, as it were, the record is one of discontinuity. (Hymes 1974a:19)

Hymes has duly warned his readers against certain people, who in Makkai's expression (1993:2), could be thought of as overzealous "paradigm mongerers." Hymes correctly notes that the pressure of a paradigm can influence an analyst's perspective—that is, after all, a major point in Kuhn's thesis. This fact, in and of itself, however, does not require one to reject a Kuhnian analysis.

While Hymes intends his own analysis to contrast with Kuhnian accounts, it should be made clear that it is not the intention of this study to argue with Hymes'

pointing to traditions and cynosures within linguistics. In fact, this study supports his characterization of certain schools (e.g., generative linguistics) as a cynosure among traditions. The notion of cynosures, taken in proper context, makes an important *contribution* to Kuhn's theory. This study cannot, however, accept Hymes rejection of Kuhn's theory as it may be applied to linguistics. There are two reasons for this: (1) Hymes has not adequately handled Kuhn's proposals regarding paradigms, and (2) Hymes *own* account of linguistics does not conflict with Kuhn's proposals.

As with several other theoreticians addressed here, one can infer that Hymes is relying on the 1962 text of Kuhn's *Structure*. There are three points in his analysis which support this inference: First, while Hymes notes the existence of the second edition (1970) in his bibliography, his single parenthetical reference to Kuhn is to the first edition (1962). Second, Hymes specifically suggests that Kuhn's theory could benefit from a discussion of paradigm communities. He writes:

We tend to think of paradigms in terms of intellectual innovation winning its way by merit, but what is fundamental to the whole thing, I think, is the existence of the paradigm community. Kuhn himself has nothing to say about the criteria by which the scientific status of the successive paradigmatic innovations is guaranteed. It would seem entirely sufficient, to produce the phenomena he describes, to have a community, guided in problem-solving by a dominant model, and sharing over any particular period of time some common commitment to the purposes of both. Given these ingredients, one might find an unending series of successive 'paradigms', as one takes up the anomalies of another, without any continuity of progress to be observed across the whole. (Hymes 1974a:17)

Reader's familiar with Kuhn's 1970 Postscript will readily identify in this quotation a request for the very material Kuhn covers in that Postscript. Except for Hymes' later publication date, one might wonder if Kuhn's Postscript was, in part, a response to Hymes. As it stands, however, Hymes agrees with other critics of Kuhn's 1962 text, all the while overlooking the fact that Kuhn addressed these criticisms in the 1970 Postscript (see Kuhn 1996:176ff).

Third, Hymes (1974a) has an underdeveloped notion of paradigms. As addressed previously, this is common among theoreticians who rely upon the 1962 text without the benefit of the clarification and elaboration offered in 1970 Postscript. Hymes' view of Kuhn's theory suffers in this regard.

Hymes has interpreted paradigm to mean theory or, at best, school of thought. Accordingly, he overlooks both the constellation of commitments and the shared examples components which Kuhn stresses in the Postscript. In missing the discussion of scientific communities organized around paradigms, he accordingly overlooks the fact that Kuhn writes of scientific communities as existing at various levels.

As with Percival, it seems that Hymes' major reason for rejecting Kuhn lies in a misunderstanding stemming from Kuhn's choice of examples. Because of the grand examples he employed ("mega-paradigms" with lone innovators, complete displacement of antecedents, and well defined histories), Kuhn is mistakenly interpreted as suggesting that all paradigms (if they *are* paradigms) will display similar characteristics. With that understanding, Percival and Hymes find it difficult to reconcile their notion of paradigms with the history of linguistics. (For example, in discussing the coexistence and continuing longevity of certain paradigms in linguistics, Hymes writes, "How can this be so, if paradigmatic succession is unilinear, in the image of an Einstein succeeding a Newton as law-giver?"—1974a:11.)

With the benefit of the Postscript clarification, however, one may clearly see that Kuhn is addressing both the grand scale *and* the subcommunity scale, and all in between. Indeed, the traditions Hymes correctly identifies in linguistics fit firmly within that description. The same may be said for the cynosures. Kuhn writes:

A scientific community consists, on this view, of the practitioners of a scientific community. . . . *There are schools in the sciences, communities, that is, which approach the same subject from incompatible viewpoints.* But they are far rarer

there than in other fields; *they are always in competition*; and their competition is usually quickly ended. ...

Communities in this sense exist, of course, at numerous levels. The most global is the community of all natural scientists. At an only slightly lower level the main scientific professional groups are communities: physicists, chemists, astronomers, zoologists, and the like. For these major groupings, community membership is readily established except at the fringes. Subject of highest degree, membership in professional societies, and journals read are ordinarily more than sufficient [for identification]. Similar techniques will also isolate major subgroups: organic chemists, and perhaps protein chemists among them, solid-state and high-energy physicists, radio astronomers, and so on. It is only at the next lower level that empirical problems emerge [in the effort to define a community]. ... I take it that the job can and will be done, at least for the contemporary scene and the more recent parts of the historical. *Typically it may yield communities of perhaps one hundred members, occasionally significantly fewer. Usually individual scientists, particularly the ablest, will belong to several such groups either simultaneously or in succession.*

Communities of this sort are the units that this book has presented as producers and validators of scientific knowledge. *Paradigms are something shared by the members of such groups.* (Kuhn 1996:177-178; italics added)

A comment should be made regarding Hymes' suggestion that linguistics may not follow Kuhn's account because it hasn't, in Hymes' view, been organized around a single major paradigm. (This issue is closely related to Percival's and Figueroa's concern over the status of linguistics as a science or mature science.) While this study disagrees with that suggestion and, instead, considers a major paradigm to be in evidence, it is important to recognize that this is not a necessary condition for Kuhn's theory to prove useful. As Hymes seems to be aware, Kuhn notes that the social sciences tend not to display fidelity to a single paradigm as is common among the natural sciences (Kuhn 1996:165); however, Kuhn does *not* intend by this that the social sciences and non-sciences do not employ paradigms or display behavior patterns organized around paradigms. Rather, as Kuhn is careful to address in the Postscript, the social sciences and non-sciences do employ paradigms (particularly as this term refers to shared examples). In writing *Structure*, it was Kuhn's intention to, first, point out that the sciences are indeed *like* the non-sciences in this respect, yielding similarity in periodization and institutional structure. Only subsequently could he point out that the sciences tend to *differ* from the non-sciences in

the degree to which they unify around individual paradigms in their pursuit of progress (1996:208). Hymes proposals regarding traditions and cynosures, then, do not conflict with Kuhn's notion of paradigms; rather, they support it.

Finally, this section addresses a suggestion by Adam Makkai, which at first glance seems to contrast starkly with those offered by Percival and Hymes. Whereas Percival suggests that the discipline is an expression of coexistent competing paradigms, and Hymes suggests the discipline expresses an assemblage of traditions marked by cynosures, Makkai writes, "*The Structure of Scientific Revolutions* is simply NOT APPLICABLE TO LINGUISTICS. Our field has had but one 'paradigm' ever since the learned debates of the ancient Greeks regarding whether language was subject to rules (the 'analogies' of the Alexandrians) or a matter of random lists (the School of Pergamon)" (Makkai 1993:7; capitalization in original).

Makkai is basically sharing concern with Hymes that excess zeal over Kuhn's proposals has spawned revolutionary hype and a resulting hysteria. Hymes wishes to tie contemporary linguistics to ancient (and contemporary) folk linguistics (see Hymes 1974a:2ff); Makkai wishes to place the roots of contemporary linguistics in the inquiries of the ancient Greeks. Perhaps the question of linguistic paradigms hinges, in part, on the age old distinction between lumpers and splitters. In other words, it is a matter of scope (see again Kuhn 1996:177). If Makkai wishes to lump the entire history of linguistics into a single mammoth paradigm, then, in Makkai's honor, "*Long live the unity of knowledge!*"²²

Many others in the community of linguists, however, find it advantageous to seriously consider the presuppositions and metatheory shared by various communities and levels of community structure. As mentioned in the introductory chapter of this study, historiography may have as an objective "... to lay bare the sometimes unconscious

assumptions that linguists bring to their theories of language and to follow the consequences of those assumptions through the elaboration of the theories, often over long periods of time" (Andresen 1987:647). In that, the discipline may not only better understand the past, but also better determine goals for future progress. Carefully applied, Kuhn's theory may be a useful tool toward that end.

4.2.3 Linguistics and Kuhn's idea of normal and revolutionary phases

In contrast to other components of his theory, such as incommensurability, Kuhn's ideas regarding normal and revolutionary phases have not been particularly controversial. For example, John Horgan, who holds back praise for some components of Kuhn's theory, nevertheless endorses Kuhn's notion of normal science. Having compared the philosophies of Kuhn and Sir Karl Popper, he writes: "To say that the ideas of Popper and Kuhn are flawed is not to say that they cannot serve as useful tools for analyzing science. Kuhn's normal-science model accurately describes what most scientists now do: fill in details, solve relatively trivial puzzles that *buttress* rather than *challenge* the prevailing paradigm" (Horgan 1996:47; italics added). Nevertheless, having been lost in the shadow of more controversial components, the idea of normal and revolutionary phases has not been well represented in the linguistic literature. Kuhn himself describes the process via the analogy of a chess game, repeated here for convenience:

In so far as he is engaged in normal science, the research worker is a solver of puzzles, not a tester of paradigms. Though he may, during the search for a particular puzzle's solution, try out a number of alternative approaches, rejecting those that fail to yield the desired result, he is not testing the *paradigm* when he does so. Instead he is like the chess player who, with a problem stated and the board physically or mentally before him, tries out various alternative moves in the search for a solution. These trial attempts, whether by the chess player or by the scientist, are trials only of themselves, not of the rules of the game. They are possible only so long as the paradigm itself is taken for granted. Therefore, paradigm-testing occurs only after persistent failure to solve a noteworthy puzzle has given rise to crisis. (Kuhn 1996:144, 145)

In an interview with Horgan, Kuhn noted that his repeated expression of normal science as "puzzle solving" and "mopping up" may have occasionally been interpreted as negative or condescending, but he insists that his intention was only descriptive: "Maybe I should have said more about the glories that result from puzzle solving, but I thought I was doing that" (Horgan 1996:45).

In rendering his markedness-theory account of paradigms within scientific communities, James McCawley implicitly addresses the phenomenon of Normal Science. Unfortunately, in so doing, he implies that all new knowledge stands in conflict with an established paradigm. Within Kuhn's chess analogy, the scientist may practice his "game," trying and discovering new "moves," without ever questioning the rules to the game. That process is normal science. *Revolutionary* science has begun when the player rejects the very rules of the game and tries to invent another. McCawley seems to suggest a more continuous process, whereby every new discovery is to be defined as revolutionary. Obviously, every new discovery is *new*, but that does not necessarily make it revolutionary, at least not in the sense proposed and developed by Kuhn. In a series of statements, McCawley writes:

What distinguishes a scientific community from other kinds of community, such as a religion or an artistic clique, is that the activity relevant to the identity of the community is the acquisition and refinement of knowledge. I emphasize that the refinement of knowledge is essential to the status of a community as a scientific community: the life of the community must include not only the accretion of new knowledge but the replacement of existing knowledge by better knowledge and the purging of old 'knowledge' that has been found to be in error. (McCawley 1979:224)

Thus, at any moment in its history, a scientific community may have a 'paradigm' and yet harbor considerable disagreement among its members not only about matters on the 'frontiers' of the science, but even about points of the paradigm itself, and these disagreements need not reflect any ignorance or moral turpitude among the parties to the disagreement. (McCawley 1979:226)

Journals and professional meetings provide forums that are an essential part of the business of extending and refining knowledge. Since a paper that merely reiterates points of the paradigm will be a waste of time for all concerned, a

large proportion of the papers presented in journals and at meetings will contain ideas which are not part of the paradigm, and which may perfectly well conflict with the paradigm. (McCawley 1979:227)

McCawley describes the "surface level" of an academic conference reasonably well, but there may be "deep structure" which he is failing to recognize. While it is true that no one wants to present, or listen to, a paper which simply reiterates previously established material, it is not accurate to represent all, or even most of the papers presented at a typical conference as being revolutionary. Indeed, it is more likely that most, if not all of the presentations will simply *build upon* the previously established rules of the game. True, they may be describing and even establishing new "moves" and "strategies" within the "chess game" of normal science, but if that is all that they do, then they can engage in that process without questioning or conflicting with the paradigm. In fact, they may be strengthening the paradigm by these actions.

A scientific paradigm does not specify every action or perspective a scientist may entertain; accordingly, there may be a degree of divergence and competitive perspectives between subcommunities, without there being any violation of the paradigm which unites them at a more fundamental level (see Kuhn 1996:44ff). To continue the analogy, revolutionary science is in view when presenters throw out the rules and invent a different game, perhaps even throwing out the "chess board" and "pieces" in the process.

4.2.4 Linguistics and Kuhn's incommensurability hypothesis

Kuhn's ideas regarding the incommensurability between paradigms is probably the most controversial of his proposals expressed in *Structure*. While the question of whether or not paradigms are incommensurable is not a simple thing to answer, or even debate, the implications of the issue are rather straight forward. If paradigms can be commensurable, then a scientist can accurately compare two paradigms and successfully choose the better.

But if paradigms cannot be commensurable, then paradigm boundaries interfere, so that scientist cannot objectively evaluate available paradigms.

Linguists offer differing opinions regarding the question of commensurability, just as they differ on other points of Kuhn's theory. Edmondson and seem to share with Percival (1976) and Hymes (1974a) their position regarding the co-existing status of linguistic paradigms. However, they direct their attention to a different issue, namely Kuhn's incommensurability hypothesis (Edmondson and Burquest 1998:1-13). Edmondson and Burquest reject this hypothesis. Building upon Imre Lakatos' modifications of Kuhn, including the idea that phenomena Kuhn addressed as paradigms might be better served by the idea of "research traditions," they insist that the major schools of thought (or research traditions) in linguistics *can* be productively compared and suggest that the ability of various theories to solve particular problems can be used as a metric for their evaluation (1998:4-8, 13; see Lakatos 1976). For example, they author a comparative review of various grammatical theories based upon how those theories account for the English auxiliary complex.

Edmondson and Burquest are well aware of the complexity of their objective. In discussing incommensurability, they write: "This incommensurability is the result of the fact that theories (Kuhn calls theories of this type paradigms) define for themselves what the interesting problems in a discipline are" (Edmondson and Burquest 1998:4).

Concerning this issue, Kuhn writes:

We have already seen several reasons why the proponents of competing paradigms must fail to make complete contact with each other's viewpoints. Collectively these reasons have been described as the incommensurability of the pre- and postrevolutionary normal-science traditions *In the first place, the proponents of competing paradigms will often disagree about the list of problems that any candidate for paradigm must solve.* Their standards or their definitions of science are not the same. (Kuhn 1996:148; italics added)

In other words, if a comparative test of grammatical theories were to claim an *absolute* standard of measurement, that test would require a neutral, theory-free set of problems in order to be an objective (unprejudiced) test. As Edmondson and Burquest note in their preface, their review was designed for use in connection with a graduate course in linguistic theory. Illustrations afforded by the English auxiliary complex undoubtedly serve some theories better than others, but professors of a complex discipline must nevertheless endeavor to instruct students in the details of competing (and sometimes conflicting) theories.

The situation raises an additional question concerning incommensurability: If the discipline of linguistics is, indeed, a complex of co-existing paradigms, then to what extent may any individual linguist (or linguistics student) simultaneously handle multiple *competing* paradigms? Can an individual personally employ two (or more) paradigms simultaneously? George Lakoff points out that, indeed, many scientists (including linguists) obviously *do* employ competing models in their research. He writes:

Many functioning scientists, in their everyday work, depend on the ability to shift from one conceptualization to another. In fact, *learning* to become a scientist requires learning alternative conceptualizations for scientific concepts. Take electricity for example. What intuitive understanding of electricity is required to be able to solve problems with circuit diagrams correctly? As Gentner and Gentner (1982) observe, there are two prevalent ways of metaphorically understanding electricity: as a fluid and as a crowd made up of individual electrons. Both conceptualizations are needed. Those who understand electricity only as a fluid tend to make systematic errors in certain kinds of problems--those where the crowd metaphor works better. Students who understand electricity only as a crowd of electrons tend to make mistakes on a different set of problems--those where the fluid metaphor works better. Understanding electricity, at a certain level of sophistication, requires metaphors—more than one. Knowing how to solve problems in electrical circuitry involves knowing which metaphor to use in which situation. (Lakoff 1987:305)

The question is somewhat resolved by isolating the two senses of Kuhn's term 'paradigm', as: (1) a *constellation of group commitments* and (2) *shared examples*. While

the *constellation of commitments* refers to the entire constellation of beliefs, values, techniques, and so forth, *shared examples* refers to "one sort of element in that constellation," namely the concrete puzzle-solutions, employed as models or examples (Kuhn 1996:175). Accordingly, in addressing the multiple models which a physicist employs in addressing electricity, Lakoff is referring to the *shared examples* sense of the term 'paradigm'. Similarly, as discussed above, in his 1970 Postscript, Kuhn discusses theory (in its narrow sense of "technical account of phenomena") as an element of the "disciplinary matrix," stating: "All or most of the objects of group commitment that my original [1962] text makes paradigms, parts of paradigms, or paradigmatic are constituents of the disciplinary matrix, and as such they form a whole and function together" (Kuhn 1996:182). Note that here Kuhn refers to theory as an object of group commitment. In other words, he has isolated an object of group commitment from the *constellation of commitments* itself.

So, repeating the questions, can an individual linguist (or linguistics student) simultaneously handle multiple competing paradigms? If the question is in reference to paradigms as *shared examples*, clearly the answer must be "yes." It is a rare occurrence for a scientist to consistently employ a *shared example* without having inherited *commitments*, or without developing *commitments* during its use. *Shared examples* and *group commitments* tend to go hand in hand. A linguist may employ more than one theory (object of commitment), provided he is not overly committed to any particular object. Some linguists, however, may not be so eclectic. Kuhn argues that, within normal science, *most* scientists are strongly committed to particular objects.

The anthropologist Thomas Headland offers some insight into this issue. In a symposium on the limitations of binary thinking in contemporary anthropology, Headland

discussed the possibility of employing theories as tools, without developing excessive commitment to any particular tools:

My point here is that anthropological schools of thought should be tried and, if workable, adopted as *tools*, or windows. This is a helpful way to approach theories. The trouble—defined in this symposium as “binary thinking”—comes when these paradigms *become entrenched as ideologies*. (Headland 1997)

When and how does the practitioner go from simply *using* a theory or model to *building a constellation of commitments* with that theory or model as foci? Commenting upon Kuhn, Hoyningen-Huene suggests that commitment to a theory tends to grow as the body of perceptions dependent upon that theory grows. The ability to switch to a second perception may be inversely related to one’s affinity for a previous perception. Quoting Kuhn (1996:85, also 114), Hoyningen-Huene writes:

For one thing, according to Kuhn, “the scientist does not preserve the gestalt subject’s freedom to switch back and forth between ways of seeing.” This ability is not denied the scientist in principle, however, since the historian of science who diagnoses such perceptual changes must also be able to reproduce them. It is rather the scientist’s interests which prevent him or her from returning, after a perceptual change he or she believes to be advantageous, to the mode of perception left behind. If the scientist considers the old mold at all, it is reflectively to reject it, not to reproduce it in all its immediacy. (Hoyningen-Huene 1993:41)

Hoyningen-Huene is primarily commenting upon the problem of incommensurability as it relates to paradigm shift. Kuhn seems to suggest that it is impossible to jointly explore two paradigms unless a switch has been made from one to the other (1996:204). An analyst who has made a philosophical switch from a prior paradigm into a later paradigm may “look back into” the prior paradigm he held earlier. But it can be difficult for an analyst working from within the prior position to analyze a paradigm he has not actually held. Furthermore, with the passage of time it may become increasingly difficult for an analyst who has switched to a later paradigm to recreate a pre-switch perspective (Robert Andrew Barlow 1998, personal communication). This is not to

suggest that a paradigm switch is necessarily a one-way bridge, although such mono-directional movement is the more normative scenario.

Finally, George Lakoff adds some important modifications to the typical approach to the debate regarding incommensurability. Lakoff suggests that the contemporary version of the debate regarding relativism and commensurability really began in linguistics, with the hypotheses of Benjamin Lee Whorf, who “claimed that the conceptual systems of languages could be so radically different that they could not ‘be calibrated,’ that there was no common measure, no common standard by which they could be compared” (Lakoff 1987:322). That debate was taken up by philosophers, including Kuhn, and later Paul Feyerabend (orig. 1975, 1988, 1993).

Lakoff explains that Kuhn and Feyerabend, as well as most of their critics, fail to address a crucial point, that “there are several *kinds* of commensurability, and commentators are by no means clear about which kind is being discussed.” He adds, “conceptual systems that are commensurable by one criterion may be incommensurable by another” (Lakoff 1987:322). He provides a list of five kinds of commensurability:

Translation seems to be the favored criterion of objectivist philosophers. Two conceptual systems are commensurable if each language can be translated into the other, sentence by sentence, preserving truth conditions.

Understanding is an experientialist criterion. Two conceptual systems are commensurable if they can both be understood by a person—presumably via the preconceptual structure of his experiences and his general conceptualizing capacity.

Use is one of Whorf’s criteria. Two conceptual systems are commensurable if they use the same concepts in the same ways.

Framing derives from the work of Fillmore and Kuhn. Two conceptual systems are commensurable if they frame situations in the same way and if there is a one-one correspondence between concepts in the two systems, frame by frame.

Organization derives from the work of Brugman. Two conceptual systems are commensurable if they have the same concepts organized relative to one another in the same way. (Lakoff 1987:322)

Lakoff continues, stating, "All of these are criteria for *total* commensurability. They can be made into criteria for partial commensurability by characterizing 'partial' either with respect to degree of commensurability, or with respect to corresponding parts of the total systems. For example, two systems may be commensurable in their concepts of space, but incommensurable in their concepts of time" (1987:322, 323).

With these five kinds of commensurability in mind, Lakoff then returns to Whorf's hypothesis and reviews the classic objectivist critique of that hypothesis. That critique goes as such: A critic may note that Whorf has, himself, explained his classic example of the Hopi conceptual system to a non-Hopi, English reading audience via the English language. From the classic objectivist perspective, the fact that Whorf was able to do this illustrates that the two systems are *not* incommensurable, as Whorf presumed. The critique then argues by extension that, if the classic example is proved wrong, then the whole hypothesis has been proved invalid.

Lakoff does not accept this critique as sufficient cause to dismiss Whorf in and of itself. He points out that that the critique "uses the translatability criterion, which is defined as the preservation of truth conditions in sentence-by-sentence translation," a criterion which is itself an objectivist criterion. There are, however, four other criteria remaining. While the Hopi conceptual system may indeed be commensurable with that of an English reading audience in regard to *Translation* and *Understanding*, they are not commensurable on the *Use*, *Framing*, and *Organization* criteria (Lakoff 1987:327, 328).

The "goodness" or "badness" of a particular revolution may be up for grabs. However, one can attempt to understand the particular problems driving that shift. An analyst may not agree with another's choice to switch, but he or she may, nevertheless, at least consider the types of problems which a particular community wishes to answer,

particularly if one is willing (and able) to examine the different *types* of commensurability involved.

4.3 The Saussurean paradigm

With an eye toward discussing the role of the code model of communication in the contemporary tradition, the preceding sections of this chapter reviewed Kuhn's theory of paradigms and scientific revolution, as well as the critiques offered by various linguists in response to that theory. This model serves a significant role as a paradigmatic model. It is a major component in the disciplinary matrix of a particular paradigm of linguistics.

Hymes is correct in pointing to multiple traditions and *cynosures*; however, his assertion that plurality negates the validity of Kuhn's theory as applied to linguistics is misguided. A plurality of traditions does not negate the possibility that those traditions are closely related. In fact, Kuhn's theory would suggest the hypothesis that, if traditions do co-exist for an extended period, then it is likely that to some extent those traditions *share* a body of presuppositions. In other words, while they contrast on certain points, they are nevertheless siblings. As has been demonstrated, the code model of communication is not simply the property of a single school of thought within the discipline. Many schools of linguistics share the code model as a means of defining basic level presuppositions about communication and language. Schools may differ in how they define components of the model, but many remain related in their dependence upon code model presuppositions.

How is it that those shared presuppositions are so easily overlooked or taken for granted by historiographers? McCawley's markedness theory analogy here proves useful (1979). Code model presuppositions in linguistics, whatever the particular school of tradition employing them, have generally gone without question simply because code model linguistics has been the unmarked case. Scientists find no need to debate the presuppositions upon which they agree. That, after all, is the beauty of normal science;

once the community has settled upon a body of presuppositions, it can proceed, building upon that foundation without having to redefine or address the concerns so established. For the majority of contemporary linguists, then, the very notion of linguistics has been synonymous with code model linguistics.

The preceding comments notwithstanding, the differences between linguistic traditions should be addressed. If many schools of linguistics are siblings within a broader paradigm, how then can one adequately account for the competition between traditions, such as Hymes identifies? The answer is simply the counterpart to Kuhn's assertion that within normal science scientists share a set of presuppositions, and therefore need not debate the content of those presuppositions. That is, competition may readily proceed in areas of inquiry which the paradigm does not address or for which no rules have been defined—in other words, in areas where presuppositions are *not* shared. While Hymes interprets competition to be counter evidence for the existence of an encompassing paradigm in linguistics, Kuhn's theory does not suggest that normal science will exclude competition, *per se*.²³ In fact, such competition should be *anticipated* when there are unspecified areas within the paradigm. Kuhn writes:

Scientists can agree that a Newton, Lavoiser, Maxwell, or Einstein has produced an apparently permanent solution to a group of outstanding problems and still disagree, sometimes without being aware of it, about the particular abstract characteristics that make those solutions permanent. They can, that is, agree in their identification of a paradigm without agreeing on, or even attempting to produce, a full interpretation or rationalization of it. Lack of a standard interpretation or of an agreed reduction to rules will not prevent a paradigm from guiding research. Normal science can be determined in part by the direct inspection of paradigms, a process that is often aided by but does not depend upon the formulation of rules and assumptions. Indeed, the existence of a paradigm need not even imply that any full set of rules exists. (Kuhn 1996:44)

In discussing the fact that “various research problems and techniques” may “arise within a single normal-scientific tradition,” Kuhn explains:

What these have in common is not that they satisfy some explicit or even some fully discoverable set of rules and assumptions that gives the tradition its character and its hold upon the scientific mind. Instead, they may relate by resemblance and by modeling to one or another part of the scientific corpus which the community in question already recognizes as among its established achievements. Scientists work from models acquired through education and through subsequent exposure to the literature often without quite knowing or needing to know what characteristics have given these models the status of community paradigms. And because they do so, they need no full set of rules. The coherence displayed by the research tradition in which they participate may not imply even the existence of an underlying body of rules and assumptions that additional historical or philosophical investigation might uncover. ... Paradigms may be prior to, more binding, and more complete than any set of rules for research that could be unequivocally abstracted from them. (Kuhn 1996:45-46)

Note that Kuhn mentions the coherence displayed by a research tradition. This coherence exists in spite of the fact that subcommunities will differ in regard to how exemplars are applied and in regard to areas which are not defined by rules at the larger community level. Kuhn is well aware that different communities employ exemplars in differing ways, as well as employing certain exemplars peculiar to themselves. He comments, "More than other sorts of components of the disciplinary matrix, differences between sets of exemplars provide the community fine-structure of science. All physicists, for example, begin by learning the same exemplars As their training develops, however, the symbolic generalizations they share are increasingly illustrated by different exemplars," so that while they share a particular equation, "only its more elementary applications are common to both groups" (1996:187). In other words, while the larger community may share basic exemplars, particular modifications and applications will be increasingly community and subcommunity specific.

It is interesting to note that, while Hymes insists that linguistics has not been characterized by paradigms, but by traditions and cynosures, he comments upon broad traditions within which the various schools of linguistics have functioned. He lists those broad traditions as *traditional grammar*, *comparative linguistics*, and *structuralism* (which

he suggests continues through this century and *includes* generative linguistics) (1974a:15, 22-23). Elsewhere in Hymes (1974a), he suggests that perhaps *philological etymology* should be included as a paradigm or grand tradition (1974a:28, esp. in reference to Metcalf 1974). Presumably the philological tradition would fit chronologically between traditional grammars and comparative linguistics, albeit with significant overlap in both directions. Such overlap influences Hymes' evaluation, however, preventing him from attributing to them paradigm status as he understands it (1974a:15). This study has already addressed the underdeveloped notion of paradigms which Hymes employs in his critique (see section 4.2.2). These grand traditions Hymes has identified certainly *do* fit within the scope and role of paradigms as Kuhn described the notion.

Relying upon Hymes, Figueroa makes similar proposals regarding the co-existence of paradigms, traditions, and cynosures in linguistics. In contrast to Hymes, however, Figueroa attempts to address the fact that great similarity *does* exist between the traditions in the discipline. Since Hymes proposes a restricted use of the term paradigm in application to the history of linguistics, Figueroa coins the alternative expressions *received linguistics* and *received linguistic theory*. She is particularly interested in the more recent of the broad traditions, which Hymes identifies as structuralism. She writes:

Related to Kuhn's notion of normal and revolutionary science, as well as to Hymes' notion of a paradigmatic community and cynosures, are the terms *received linguistics* and *received linguistic theory* which will be used throughout this study. Recall above Hymes' [(1974a:10)] proposition that certain linguistic traditions have "in their political aspect ... dominated journals, professional meetings, textbooks and the like." The terms *received linguistics/received linguistic theory* are meant to reflect this political reality. The *received* position is that which under normal science is accepted as authoritative and true. It is quite simply that which has the most institutional power. However, *received theory* has a much longer historical existence than any specific manifestation of it. For example, at various times Saussure's linguistics, Bloomfield's linguistics, or Chomsky's linguistics will be referred to as *received*, though the linguistics of Saussure, Bloomfield and Chomsky have fundamental differences. However, it is in their fundamental similarities that we find the *received* position. (Figueroa 1994:9; underscore added)

While Figueroa addresses the notion of *cynosures* and their associated political reality, she does not stop there; whereas Hymes focuses upon contrasts, Figueroa notes fundamental similarities. She continues:

However, there is a second more powerful reason why Saussure, Bloomfield and Chomsky, despite their differences as to the nature of language, may be considered practitioners of received linguistic theory. *This is because the three demonstrate certain fundamental similarities as to the scientific basis of linguistics: that there is an objective entity which linguists study, that it is independent of the humans who use it, and that it is only the "core" aspects of this entity, i.e. formal grammar, which is the object of linguistic enquiry.* That this is the received linguistic position can be witnessed by opening any college catalogue for courses offered and requirements to be met, or by scanning titles in linguistic journals.

Received linguistics, then, is the normal science assumptions about the object of linguistic enquiry, the core values of linguistics, in relation to which sociolinguistics is usually positioned on the periphery. (Figueroa 1994:10; italics added)

In referring to this broad (or grand) tradition of received linguistics, Figueroa has, of course, identified a grand paradigm of linguistics. This is not to suggest that lesser paradigms and shifts in disciplinary focus have not existed. As said before, Hymes' notion of *cynosures* is quite useful in that regard. As Figueroa has demonstrated, however, it is important to keep *both* differences and fundamental similarities in focus. A disproportionate amount of attention given toward differences between traditions can overshadow fundamental similarities uniting those same traditions. As Figueroa notes, it is in fundamental similarities that one may find the "received position" of a paradigm (1994:9).

Linguistics has been characterized by a history of broad traditions, and it does in fact currently display a received position that corresponds to one such tradition. With this understanding established, it should be apparent that the discipline does, in fact, fall within Kuhn's characterization of a mature science. However, the existence of a paradigm is not the main issue. As has been addressed in section 4.2.2, each linguistic tradition, grand and

lesser, represents a paradigm. It is not the existence of a paradigm, but rather the nature of linguistic inquiry which identifies the science as being mature. In his Postscript Kuhn writes: "What changes with the transition to maturity is not the presence of a paradigm but rather its nature. Only after the change is normal puzzle-solving research possible" (1996:179). The received position Figueroa identifies *is* normal-science linguistics.

It should also be apparent that received linguistics displays code model presuppositions as identified in chapter 3. The code model serves to embody foundational presuppositions upon which contemporary normal-science linguistics depends. In Kuhnian terms, the code model is a paradigmatic model in the disciplinary matrix. In addition to its function as a conceptual metaphor, embodying presuppositions, the model also serves the paradigm as an exemplar, being used in teaching the received position to which Figueroa refers. Accordingly, those places in the linguistic literature where the model appears in full form are typically in more general texts, and early in those texts, for it is regarded as foundational material. As such, the model is seldom presented as a theory or model, but rather as a statement of reality. In contrast, ancillary statements, which build upon code model presuppositions, are typically identified and presented as theories or models. Elements of the model are often incorporated in such ancillary statements, even if the model itself is not presented in full form. In such statements, the applications and concerns to which the theory applies may be in question, but the code model components so incorporated are seldom in question. As Kuhn would describe it, with such a conceptual foundation in place, the discipline is free from the burden of constantly reexamining the issues so defined. This is the phase in a disciplinary life cycle that he calls normal science. He writes:

Once the reception of a common paradigm has freed the scientific community from the need constantly to re-examine its first principles, the members of that community can concentrate exclusively upon the subtlest and most esoteric of the phenomena that concern it. (Kuhn 1996:163-164)

As a study of the code model, this discussion is not concerned with the general history of linguistics and linguistic paradigms, but with the single broad tradition within which the code model has served as a paradigmatic model. That tradition, or paradigm of linguistics as it may indeed be called, is the tradition Hymes calls structuralism. The term is useful, but its scope outside of linguistics hinders its effectiveness in the current discussion. As Joseph writes:

Indeed, between the 1940s and the 1960s most fields of human knowledge came under the domination of 'structuralism' (a term first used in linguistics around 1928), understood in this context as the extrapolation out of linguistics of Saussure's concept of *langue* as a self-contained system of syntagmatic and paradigmatic relations among elements of negative content. (Joseph 1994:3669)

Another reason to use a term other than structuralism in reference to the broad tradition is that the closely related term structuralist has come to signify a particular lower level tradition within that broad tradition. Because it is confusing to refer to multiple levels in a hierarchy by the same or closely similar terms, this study will hereafter refer to the broad tradition of linguistic structuralism as the *Saussurean paradigm*.

It may at first appear strange to suggest that the code model serves as an important paradigmatic model in the Saussurean paradigm, particularly since the paradigm is older than the model itself. As was explained in chapter 3, the code model is created via the integration of three constituent models: the conduit metaphor, Saussure's speech circuit, and information theory. Since information theory did not appear on the scene until 1948, it would be anachronistic to suggest that the code model were older than that date. As is also explained in chapter 3, while the code model does depend heavily upon information theoretic terminology, most appeals to the code model *do not* accurately recognize Shannon's theory from which it is derived. Instead, the code model typically superimposes information theoretic terminology upon the notion of communication proposed in Saussure's speech circuit model. While it is true that some formal components of

Saussure's model were articulated by Locke over a century before Saussure's Geneva lectures and are, thereby, older than Saussure's particular account, Saussure does not share all of Locke's presuppositions. Similarly, the paradigm does not share the presuppositions advocated in Locke's philosophy. Rather, it is based upon the philosophy of communication and language offered by Saussure.

One may wonder why some theoreticians fail to identify Saussure's role in the a grand paradigm of linguistics. Percival (1976), for example, suggests that a paradigm, if it was to fulfill Kuhn's account of paradigms, should be the work of a lone innovator. Since *Cours* was published posthumously and was not immediately recognized as a landmark in linguistic thought, the Saussurean tradition may not seem to fit Percival's notion of paradigm (see again section 4.2.2). However, this is not a problem in Kuhn's notion of paradigms. As McCawley explains, such an innovator may be an asset, but not a necessity:

The existence of a single innovator (or of someone who can be palmed off as a single innovator) is a propagandistic asset that has undoubtedly helped various paradigms to acquire paradigm status faster than they otherwise would have, but Percival's first point [regarding lone innovators] is at best a side issue. (McCawley 1979:279)

The circumstances surrounding publication of *Cours* may be interesting and historically significant, but in regard to the immediate question regarding the status and validity of the paradigm, the fact that the development of structuralism was a response to posthumous publication is, at best, a mute point. Joseph writes:

In 1907, 1908-09, and 1910-11, he [Saussure] gave at the University of Geneva three courses in general linguistics, a topic on which he never published anything. Soon after his death in 1913, his colleagues Charles Bally (1865-1947) and Albert Sechehaye (1870-1946), appreciating the extraordinary nature of the course Saussure had given, began gathering what manuscript notes they could find, together with the careful and detailed notebooks of students who had taken one or more of the three courses, especially Albert Riedlinger (1883-1978). From these they fashioned the *Cours de linguistique générale*, published at Lausanne and Paris in 1916. It would become one of the most influential

books of the twentieth century, not just for linguistics, but for virtually every realm of intellectual endeavor. (Joseph 1994:3664)

Clearly, then, the impact of Saussure's theoretical innovations is the more important thing to consider here, particularly when contrasted with the predominant historical-comparative perspective which it came to supersede. In regard to the revolutionary nature of Saussure's proposals, Harris comments:

Saussure was the first to question whether the historical study of languages could possibly provide a satisfactory foundation for a science of linguistics. The question was as profound as it was startling: for the assumption most of Saussure's contemporaries made was that historical philology already *had* provided the only possible scientific foundation. They believed, as Max Müller optimistically put it in the 1860s, that linguistics was already dealing with the facts of language just as scientifically as 'the astronomer treats the stars of heaven, or the botanist the flowers of the field'. In Saussure's view, nothing could have been more profoundly mistaken. (Harris 1983:x-xi)

Referencing de Mauro (1972:366), Harris notes the manner in which theoreticians of the day were at first perplexed by Saussure's proposals, another indication of their revolutionary quality:

Saussure had already become compulsory reading for linguists within five years of the publication of the *Cours*, which was widely reviewed. ... What linguists read into Saussure is a different question. It was to become almost a commonplace of Saussurean exegesis to point out that even those who were originally most sympathetic and most directly influenced by Saussure ... did not always seem to understand some of his basic ideas. That this should have been so, if it was so, is doubtless an indication of the difficulty which a generation brought up to accept the assumptions of nineteenth-century comparative and historical linguistics experienced in coming to terms with Saussurean structuralism. (Harris 1987:xi)

Koerner generally echoes Harris' comments regarding the revolutionary quality of *Cours*. He writes:

It is generally agreed that his *Cours* ushered in a revolution in linguistic thinking during the 1920s and 1930s which is still felt in the 1990s in many quarters, even beyond linguistics proper. He [Saussure] is universally regarded as the 'father of structuralism.' (Koerner 1994:3662)

Koerner later continues:

The ideas advanced in the *Cours* produced a veritable revolution in linguistic science; historical-comparative grammar which had dominated linguistic research since the early nineteenth century was soon relegated to a mere province of the field. At least in the manner the *Cours* had been presented by the editors, Saussure's general theory of language was seen as assigning pride of place to the non-historical, descriptive, and 'structural' approach (Saussure himself did not use the last-mentioned term in a technical sense). This led to a tremendous body of work concerned with the analysis of the linguistic system of language and its function, and a neglect of questions of language change and linguistic evolution in general—a situation which remains characteristic of the linguistic scene in the 1990s, in particular the framework associated with the name of Noam Chomsky. From the 1920s onwards a variety of important schools of linguistic thought developed in Europe that can be traced back to proposals made in the *Cours*. These are usually identified with the respective centers from which they emanated, such as Geneva, Prague, Copenhagen, and Paris. In North America too, through the work of Leonard Bloomfield, Saussure's ideas became stock-in-trade among linguists, descriptivists, structuralists, and generativists. (Koerner 1994:3663)

Note in particular that Koerner writes of Saussure's ideas coming to influence *various* schools of thought, or traditions as Hymes has called them. It should be noted that each of the traditions Koerner mentions has in turn enjoyed the privileged position of *cynosure*. In other words, Saussure's influence has not been limited to a single *cynosure*.

As Harris and Taylor note, Saussure's *Cours* ushered in a change which has been described as a 'Copernican revolution' in Western linguistic thought (1989:176-177, Harris 1987:ix):

The term 'Copernican' is apt. For just as Copernicus had claimed that the Earth rotated about the Sun, instead of the Sun rotating about the Earth, Saussure claims something analogous in the case of language. His thesis was that languages are the instruments which enable human beings to achieve a rational comprehension of the world in which they live. Instead of seeing words as mere adjuncts to our grasp of reality, Saussure saw our understanding of reality as depending essentially upon our social use of the verbal signs which constitute the language we use. Words are not peripheral but, on the contrary, central to human life. Human existence is, by definition, a linguistically articulated existence. (Harris and Taylor 1989:177)

Harris suggests that by the 1950s, while individual theoreticians would take differing positions regarding the significance of Saussure's influence, "few theorists were

prepared to deny that distinctions drawn by Saussure provided the basis on which a modern science of language might be established" (Harris 1987:xiii). He notes that in 1950 Firth considered it reasonable to classify professional linguists into four groups: Saussureans, anti-Saussureans, post-Saussureans, and non-Saussureans (Firth 1950:179, in Harris 1987:xiii). By 1957, Spence felt secure in making the pronouncement: "We are all Saussureans now" (Spence 1957:15, in Harris 1987:xiii). Writing in 1983, Harris comments:

Saussure's standing as the founder of modern linguistics remains unchallenged more than half a century after his death. It is based on two facts. One is that Saussure, although only one among many distinguished linguists of his day, was the first to recognise the particular range of theoretical questions which had to be answered if linguistics was ever to take its place among the sciences. The other fact is that Saussure himself proposed answers to those questions which have remained either the basis or the point of departure for all subsequent linguistic theory within the academic discipline which thereafter claimed the designation 'linguistics'. (Harris 1983:ix)

While readers may concede pride of place to Saussure as the founder of modern linguistics, that concession does not negate the necessity of addressing the more recent history of linguistics. In particular, the study would be remiss to suggest that various schools of linguistics have been largely united under a single paradigm without also addressing the particular influence posed by the generative school. As has undoubtedly been noted, several theoreticians quoted here have suggested that generative linguistics is a tradition *within* the broader tradition of structuralism. Such a claim may seem counterintuitive to some readers, particularly since the authors of generative linguistics developed that school *in contrast* to the structuralist and behaviorist schools which preceded it. Here again it is important to distinguish the broad tradition Hymes calls *structuralism* from the *structuralist* school of linguistics. The broad *tradition* of structuralism, again, is the Saussurean paradigm.

Opinions differ as to just how revolutionary Chomsky's approach was for the discipline. The literature reflects three basic views on the issue. The first is the view that Chomsky did, in fact, evoke a revolution in the discipline, and that it was a scientific revolution in the Kuhnian sense. As one might anticipate, this is the more common view held by generative linguists. Hymes (1974a:9) notes, "Many linguists have rightly sensed in the success of the Chomskyan approach something corresponding to Kuhn's concept of a paradigm, as a revolutionary, eclipsing, general view (see Thorne 1965, Grace 1969, Wells 1963, Voegelin and Voegelin 1963, and Lounsbury 1961)." (Also see Pearson 1977.) Indeed the Chomskyan approach clearly eclipsed the neo-Bloomfieldian approach which held the discipline prior to Chomsky. That fact gives this view a certain amount of plausibility; however, the view is often unnecessarily limited in its scope. It typically describes the history of linguistics in a unilinear manner, as if it were a single string of consecutive paradigms. As such, it does not adequately identify the broader paradigms in the discipline or the fact that lesser paradigms may operate within these broad paradigms.

The second view is that offered in part by Hymes (1974a), Percival (1976), and others relying upon Hymes. It is the view that while the Chomskyan approach eclipsed the neo-Bloomfieldian approach which preceded Chomsky, the shift was mainly a shift in cynosure, rather than a paradigm shift in the discipline as a whole. This view concedes that Chomsky's approach was revolutionary in the traditional sense, but since generative linguistics never came to possess the entire discipline, the view does not attribute to the generative tradition the status of Kuhnian revolution. The weakness in this account stems from an underdeveloped understanding of Kuhn's paradigm theory (see again section 4.2.2). The fact that the generative school never controlled the entire discipline poses no conflict with the assertion that the school represents a Kuhnian paradigm (that is, a constellation of commitments). Accordingly, the suggestion that the Chomskyan

revolution represents a Kuhnian revolution in and of itself presents no conflict with Kuhn's theory.

The third view, and that advocated in this study, agrees with the first view in considering the Chomskyan revolution to be a Kuhnian revolution. But in contrast to the first view, it does not view the discipline in a unilinear manner. Rather, it recognizes the generative school to be one paradigm among several, which collectively represent a broader tradition or grand paradigm. The Chomskyan approach did eclipse the neo-Bloomfieldian approach which preceded it. It did not, however, eclipse the Saussurean paradigm. Rather, it and the neo-Bloomfieldian approaches are sub-paradigms within the larger Saussurean paradigm. This fact becomes increasingly apparent as the discipline wrestles with anomalies the code model supports. Hymes writes:

With the advent of transformational generative grammar, 'structural' linguistics came to signify an eclipsed predecessor for many younger linguists. Commonly it was characterized in terms of the 'neo-Bloomfieldian' outlook, or, more adequately, in terms of an approach limited to 'taxonomy' and 'surface structure'. There was of course already a complication in defining as 'structural' an approach considered not to deal with the most important part of structure, and denying the term to the approach which did. Recently the rise of challenges to Chomsky's conception of structure has led some to give greater weight to his continuities with preceding 'structuralists', and less to his differences from them. Viewed from the standpoint of work which gives up the notion of a general system of language, or which regards variation, time, and diversity of function as the bases for an account of the linguistic means of a community, Chomsky may appear as the great defender of twentieth century structuralist principle. (Hymes 1974a:22-13; also see Hymes and Fought 1975)

Chomsky's support of the Saussurean paradigm bears some discussion, for in its early development, Chomsky's mathematical approach did seem to contrast significantly with Saussurean linguistics, at least as Saussure's proposals had been worked out to that point. As Harris notes, in the same year that Spence (1957) pronounced "We are all Saussureans now," Noam Chomsky published his *Syntactic Structures*, initiating a new

school of linguistics “which apparently owed little if anything to Saussure, however directly or indirectly assimilated” (Harris 1987:xiv). Harris writes:

The new theory proposed to treat language as ‘a set (finite or infinite) of sentences, each finite in length and constructed out of a finite set of elements’ (Chomsky 1957:13)—a definition which might well have made the author of the *Cours* turn in his authorial grave. The essential novelty of transformational-generative grammar, as proposed in *Syntactic Structures*, was the eminently unSaussurean notion of considering languages as mathematical systems, on a par with the formal systems of mathematical logic. In retrospect, that approach may well now appear to have been naive or misguided; but in 1957—to some at least—it looked full of promise. So rapidly did the new school win adherents that it doubtless seemed to many by the late 1950s that the advent of transformational grammar meant that Saussurean ideas had at last exhausted their usefulness, and a radically different era of linguistic theorizing had dawned. (Harris 1987:xiv)

Perhaps the greatest contrast between Chomsky’s approach and its predecessors was in its mathematical approach. Harris concedes that the mathematicization of linguistics was in its own right revolutionary, but he notes that it was not a new concept. Boole had already mathematicized logic and Frege had re-mathematicized it, via his work in function theory. As Harris sees it, it was inevitable that formal linguistics would follow suit, even though “Saussure’s thinking about language owed nothing to this ‘mathematical’ tradition whatsoever, and was in spirit opposed rather than congenial to any unification of logical and linguistic formalism” (Harris 1987:xiv).

In light of Chomsky’s clearly non-Saussurean mathematical approach to formal linguistics, many linguists would not have anticipated later writings, wherein he came to identify his own theory as related to that of Saussure. Harris suggests that the earlier Chomsky was simply unacquainted with Saussure and thereby incognizant of how closely his own view of communication and language compared with that of Saussure. He writes:

All the more remarkable is the fact that in less than ten years from the publication of *Syntactic Structures* a significantly altered and much more Saussurean theory of language was being proclaimed under the same ‘transformational-generative’ banner. This new version of transformational-generative linguistics drew a fundamental distinction between linguistic

'competence' and linguistic 'performance': furthermore the distinction was acknowledged as echoing Saussure's classic dichotomy between *langue* and *parole* (Chomsky 1964:62, Chomsky 1965:4), and the 'generative grammar internalized by someone who has acquired a language' identified as the *langue* (Chomsky 1964:52). It can hardly be dismissed as mere coincidence that the first English translation of the *Cours* was published in the U.S.A. in 1959, and that in the 1957 manifesto of transformationalism Saussure's name had not even appeared in a footnote. In other words, it took less than a decade (a mere hiccup in the history of linguistics) before we were 'all Saussureans again'. Needless to say, the recently discovered author of the *Cours* had to be castigated for failure to teach transformationalism *avant la lettre* (Chomsky 1964:59-60, Chomsky 1965:4); but, nevertheless, a reading of Saussure had evidently left its mark on the formulation of a doctrine which was to become as important in the linguistics of the 60s and 70s as Saussurean structuralism itself had been in the linguistics of the 20s and 30s. (Harris 1987:xiv-xv)²⁴

Elsewhere Harris writes:

Grammar for the generativists, was a system of relations between forms and meaning, and speech a set of operations by which those systemic relations gave rise to sequences of uttered sounds. Once it was realized that stating the grammar of a language as a set of generative rules is simply one possible formalization of Saussurean syntagmatics, the generative bid to redefine linguistics faded. Heresy was overnight transformed into orthodoxy. (Harris 1990:25)

This view of the history of linguistics is an important component in the present study of the code model of communication. Basic Saussurean presuppositions embodied in the speech circuit are carried into code model linguistics, and code model linguistics includes generative linguistics. Failure to identify this continuity and the shared presuppositions so generated would seriously weaken understanding of the code model and its role as a paradigmatic model in the discipline. (See figure 4.3.)

4.4 Normal and revolutionary linguistics

The remainder of this chapter is divided into two sections. The first section, *Normal linguistics: Filling in details, adding patches*, addresses development of the code model within normal linguistics. It includes discussion of ways in which Chomsky contributed to development of the code model and code model linguistics. It also addresses several theoretical "patches" which have been applied to the code model in

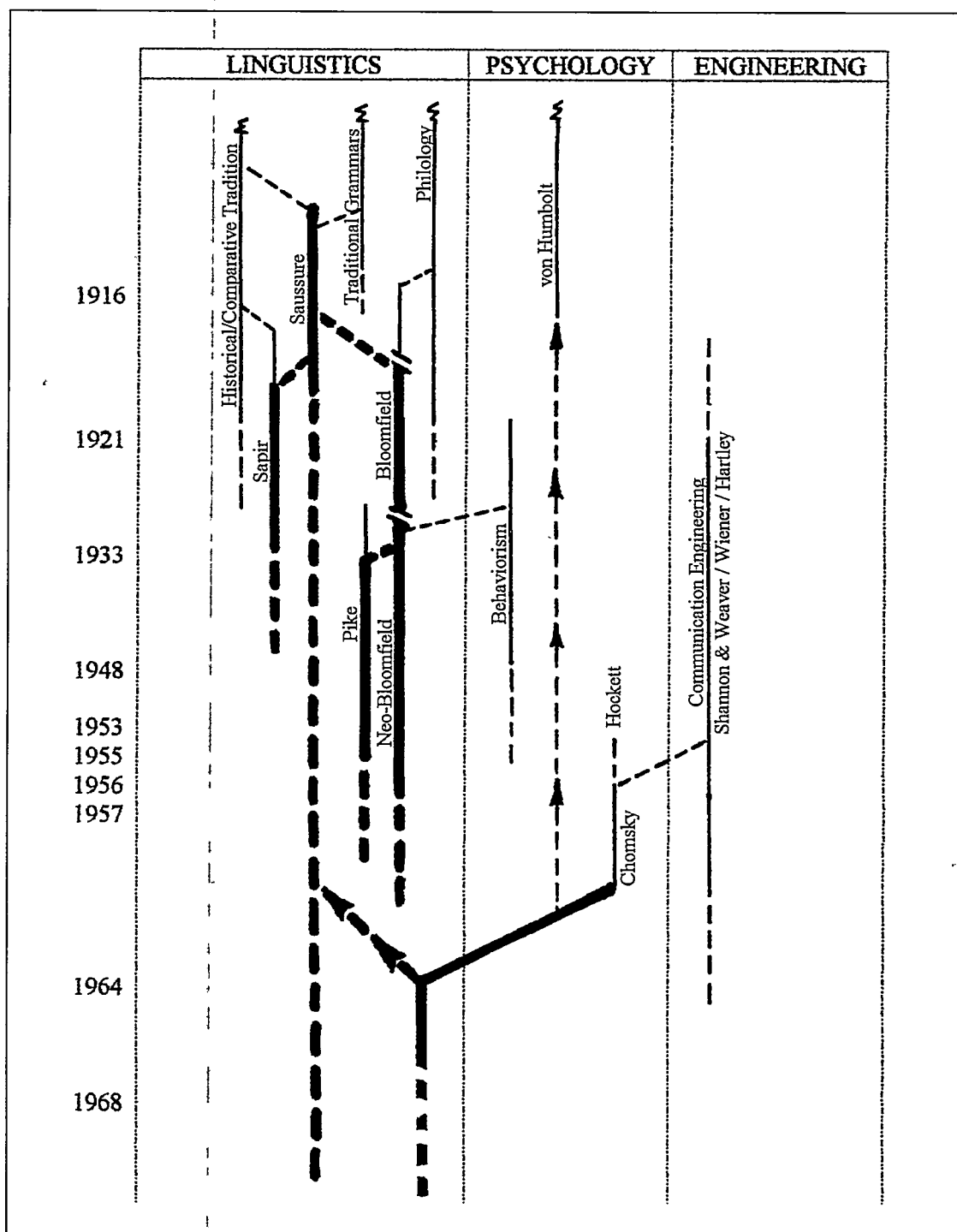


Figure 4.3. Cynosures of American linguistics in the Saussurean paradigm, including conceptual relationships to one another and neighboring disciplines. (Note: The "time" axis is not to scale. Bold lines mark cynosures of the Saussurean paradigm. Dashed lines with arrows indicate retrospective relationships.)

efforts to overcome anomalies it supports. The second section, *Revolutionary linguistics: abandoning the code model*, similarly employs Kuhn's theory in addressing several non-code model approaches to linguistics.

These sections will not attempt to present a survey of linguistic theories. Such a survey is not within the scope of this study. Rather, the study is simply concerned with how certain theories support or depend upon the code model, attempt to patch up the code model, or diverge from code model linguistics, as the case may be. The study does not intend to imply that the few theories addressed here are the only theories that employ and patch the model, or diverge from the model. There are other theories, not addressed here, that could provide similar discussion. The theories addressed here are selected as representative examples.

In considering these schools and theories addressed in these two sections, readers should remember that in using the terms normal and revolutionary, Kuhn does not intend to suggest that one approach is "normal" and the other "abnormal," nor does he intend to suggest that one approach is "dull" while the other is "exciting." Rather, the terms normal and revolutionary simply distinguish theories "conforming with an accepted standard or norm" from those suggesting "a complete change" (Neufeldt 1989: 292, 368).

4.4.1 Normal linguistics: filling in details, adding patches

Depending upon the type of activity in which the scientists are engaged, normal science approaches can be further divided into two broad groups: (a) those that attempt to fill in details of the paradigm, and (b) those that express dissatisfaction with weak areas in the paradigm and attempt to supply patches for those weak areas. Of course, this distinction is not absolute, and may be better characterized as a loose continuum. Furthermore, individual schools tend to engage in *both* types of activity, as both are

required in supporting code model linguistics. Accordingly, this section does not attempt to isolate the theoretical approaches into these two groupings. It is useful, however, to consider the distinctions involved.

In regard to the "filling in details" aspect of normal science, Kuhn suggests that scientists have identified phenomena "whose nature is indicated by existing paradigms but whose details can be understood only through further theory articulation. These are the phenomena to which scientists direct their research much of the time, but that research aims at the articulation of existing paradigms rather than at the invention of new ones" (Kuhn 1996:97).

In other words, the group has accepted the paradigm. But since no paradigm defines all areas of inquiry, the respective schools, scientists, and theories set about providing definition for those areas which are anticipated, but not detailed by the paradigm. Since particular scientists and theories do not necessarily address the same areas, and when they do address the same areas they don't handle them in the same way, competition can develop. While it is possible for one theory to eclipse the others, this does not have to happen. So long as the competing theories are mutually supported by the conceptual commitments of the paradigm, their *continued* development may be evident, even though one or another may be the cynosure at any particular point in time.

This is, of course, exactly what has happened through much of the era of the Saussurean paradigm of linguistics. The result is that the discipline has to some extent supported *para-theories*, that is, theories which purport to cover the same areas, albeit in different ways.

In regard to the "adding on patches" aspect of normal science, Kuhn explains that researchers in the normal phase of the life cycle will eventually begin discovering more and more truly problematic areas in their paradigm. As quoted previously, Kuhn writes:

Though they may begin to lose faith and then to consider alternatives, they do not renounce the paradigm that has led them into crisis. They do not, that is, treat anomalies as counter-instances, though in the vocabulary of philosophy of science that is what they are. ... Once it has achieved the status of paradigm [(i.e., a canonical position within the disciplinary matrix)], a scientific theory is declared invalid only if an alternative candidate is available to take its place. (1996:77).²⁵

Kuhn suggests that it is not an option for them to simply reject the old paradigm without simultaneously substituting another in its place, for to do so would be to reject science itself (1996:79).

Faced with such a situation, scientists practicing normal science have little recourse but to set about patching the paradigm. As Kuhn phrases it, when no new paradigm is readily available, scientists typically “devise numerous articulations and *ad hoc* modification of their theory in order to eliminate any apparent conflict” (Kuhn 1996:78). In the case of code model linguistics, this means patching the code model. The term *patch* is not intended to be pejorative; rather, it simply characterizes a distinction in the type of theories being proposed, which in turn extend from distinctions in the type of problem being addressed.

Filling in details involves providing definition for areas the paradigm anticipates, but does not define. In code model linguistics, these areas are definition of the code and definition of the transmission and reception processes. In contrast, providing patches involves wrestling with actual anomalies the paradigm supports. Anomalies are of two main types: (1) those where the paradigm is logically inconsistent, (2) those where the view of reality characterized by the paradigm is not supported by emerging data. Scientists engaged in study of such anomalous areas sometimes find themselves working the margins of their discipline, if for no other reason than the fact that they are not engaging the standard problems defined by the paradigm.

Wrestling with anomalies is, of course, an essential precursor to revolutionary science. Those developing patches would indeed be engaging in revolutionary science, except for the fact that they are trying to keep the paradigm intact. Revolutionary science, in contrast, abandons the prior paradigm and attempts to create substantive change.

The patches are important in that they help to identify the nature and depth of the anomalies (see Kuhn 1996:78). Theoreticians may eventually put so much emphasis on the patches that the original model becomes hidden. At some point, the patches themselves may be maintained and the basic model thrown out, so that the patches are reworked into a model of their own. If that happens, the new model may properly be considered revolutionary.

This section addresses use of the code model by four schools of thought. The practitioners of these schools may be identified as generativists, stratificationists, sociolinguists, functional-typologists, and inferentialists.

4.4.1.1 Generativists

Noam Chomsky has arguably been the most influential linguist of the past half century. For that reason, his role within the Saussurean paradigm has had a significant impact on the development of code model linguistics. As mentioned previously, Chomsky himself compares his own notions of competence and performance to Saussure's notions of *langue* and *parole* (Chomsky 1964). That does not mean, however, that the approach to linguistics proposed by Saussure exactly parallels that proposed by Chomsky. In fact it doesn't. Because of this, some analysts express dissatisfaction with the comparison of *langue* and *parole* with competence and performance. For example, Joseph writes:

In Saussure's view, *langue* is a 'treasury' or 'collection of impressions' that is 'deposited' in identical form in the brain of each member of a given speech community. He uses the metaphor of a dictionary, of which every individual possesses an identical copy. What the individual does with the socially-shared system falls entirely into the realm of *parole*. This distinction ... differentiates

Saussure's dichotomy from that between 'competence' and 'performance' established in the 1960s by Noam Chomsky Chomsky explicitly related competence with *langue* and performance with *parole*, though in actual fact that analogy was only partial: for Chomsky, competence (derived from innate universal grammar) is mental and individual, and performance the locus of its social actuation. Furthermore the considerable differences between Saussure's orientation toward language as a semiotic system and Chomsky's toward competence as a mental faculty make any such equations difficult. (Joseph 1994:3666)

Joseph seems to suggest that the two views are quite distinct. Described in code model terms, however, the relationship between the two becomes more clear. According to Saussure's view, the *langue* was the fixed code that allowed the speaker and hearer to communicate (see Saussure 1983:31). In this regard, it was shared by the community, lending it its social quality. In Saussure's view, this fixed code was the object of study for the discipline of linguistics. It is important to understand that Chomsky did not reject Saussure's fundamental characterization of the communication process. Rather, he simply shifted attention to a different component in that characterization. Taking *langue* as a shared fixed code for granted, Chomsky argued that the focus of attention should be the code as it operated in the mind of the individual.

Crystal similarly addresses the nature of this distinction between Saussure and Chomsky. He notes that Saussure's *langue* and Chomsky's *competence* do appeal to the same sense of the term language, but that they differ in focus of interest. He writes: "In such phrases as 'first language', 'the English language', the sense is the abstract system underlying the collective totality of the speech/writing behavior of a community (the notion of *langue*), or the knowledge of this system by an individual (the notion of competence)" (Crystal 1997:214).

How did Chomsky turn the attention of the discipline from the *langue* of the group to the mental process of the individual? The move involved two major steps:

(1) restricting the definition of language and elevating grammar, and (2) abridging the classic code model. These shall be addressed in turn.

4.4.1.1.1 A restricted definition of language and associated elevation of grammar

The manner in which Chomsky came to restrict the definition of language and elevate the notion of grammar is related to his use of information theory. As mentioned previously, Noam Chomsky's work in syntax was in part a response to Hockett, who had attempted to incorporate certain elements of Shannon's and Weaver's information theory in accounting for human language. Hockett clearly expressed his intention to incorporate information theoretic approach in his account of phonology and syntax. Chomsky, however, did not as clearly address the relationship of his own early work in syntax to developments in information theory, therefore few contemporary linguists seem aware of that influence. While the relationship of Chomsky's work to information theory could be established simply on the basis of the analogies he builds, there is no need for speculation; Chomsky specifically addresses Shannon and Weaver in several of his early papers and builds upon their work in the development of his ideas concerning models of language. This is especially clear in Chomsky (1956), *Three Models for the Description of Language*, a paper discussing mathematical models of language, which was presented at a conference on information theory. (Interestingly, Claude Shannon presented a paper at the same conference. See Shannon 1956.)

Chomsky's (1956) *Three Models* paper laid the foundation for his more famous (1957) *Syntactic Structures* (see 1957:18-25). In these two papers, Chomsky established that a "communication theoretic" approach to grammar was inadequate for the description of human language (Chomsky 1957:24, 34, 49). He was, of course, referring to the account more commonly known today as "information theory."²⁶ This rejection and the weight of

his argument were to have a broad influence. As mentioned previously, George Miller and others later abandoned the information theoretic approach in psycholinguistics, largely, it seems, as a result of Chomsky's influence (Miller 1964:n1, Miller and Chomsky 1963, Palermo 1978:110-113).

It is crucial to note, however, that Chomsky's argument concerning information theory did not constitute a *total* rejection. His statement of rejection refers specifically to the *theory of probability* Shannon and Weaver proposed, and Hockett's applications of Markov processing in particular (see Weaver 1949:117). At this point it is important to distinguish between the mathematical applications of Shannon's theory and the model of communication Shannon offered, for Chomsky did *not* reject Shannon's model of communication. He continued to find Shannon's model useful for its analogic value, as is evident in his use of information theoretic terminology in later works (e.g., Chomsky and Halle 1968:3, to be discussed). Nor did Chomsky reject certain conditions relevant to the engineering problem of communication as established by Shannon (1948, 1949) and later modified by Weaver (1949a, 1949b).

In general, the focus Chomsky gave to syntactic and phonological components is reminiscent of the focus Shannon and Weaver gave to the concern Weaver called "Level A," the "technical problem" of communication, that is, "How accurately can the symbols of communication be transmitted?" (Weaver 1949b:96). A major element in that concern was the structuring of the signal. If the signal were consistently structured, with enough distinction between elements and sufficient redundancy, then that signal could be confidently received and "decoded." That is, having read the signal, the receiver could produce a constructed message *and* measure the statistical confidence that the constructed message was equivalent to the primary message.

This required, of course, that the transmitter and receiver identify a circumscribed set of possible structures, that is, the structures which the transmitter had the capability of handling in rendering the transmission. Those structures available within that set might be finite, as in the three points “0,” “.5,” and “1,” or they might be infinite, as in the infinite number of points between “0” and “1,” but regardless, the actual message assembled had to be a possible message. That is, if messages could include any point between “0” and “1,” then “0.23432” could be a message, but “1.1” would be excluded. It is for this reason that Shannon writes, “The significant aspect is that *the actual message is one selected from a set of possible messages*. The system must be designed to operate for each possible selection, not just the one which will actually be chosen since this is unknown at the time of design” (Shannon 1949:31; italics added).

The information theoretic concern with the mathematical *structuring* of the signal obviously influenced Chomsky’s early interest in mathematical structuring of syntax in language systems, and in human language in particular. As was addressed in chapter 3, Shannon’s approach to the “technical problem” of structuring the signal involved certain logical conditions. To the extent that Chomsky’s approach followed Shannon’s, it shared those same logical conditions.

As should be evident, Chomsky’s notion of “well-formedness” is directly related to Shannon’s constraints regarding possible messages. The information theoretic perspective regarding the set of possible messages and the message and signal alphabets was expressed in Chomsky (1957) as follows:

... I will consider a *language* to be a set (finite or infinite) of sentences, each finite in length and constructed out of a finite set of elements. All natural languages in their spoken or written form are languages in this sense, since each natural language has a finite number of phonemes (or letters in its alphabet) and each sentence is representable as a finite sequence of these phonemes (or letters), though there are infinitely many sentences. (Chomsky 1957:13)

As might have been anticipated, readers unfamiliar with Shannon's theory were somewhat perplexed by this means of expression and the conditional statements it entailed.

Similar expressions regarding the set of possible messages, the signal structure, and the correspondence between structure and meaning appear in Chomsky and Halle (1968), where they write, "We may think of *a language as a set of sentences*, each with an ideal phonetic form and an associated intrinsic semantic interpretation. The grammar of the language is the system of rules that specifies this sound-meaning correspondence" (Chomsky and Halle 1968:3; italics added).

The grammar is described here as the system of rules specifying the correspondence of sound and meaning.²⁷ This is, of course, a clear point at which Chomsky and Halle cross the line into code model territory. In spite of this description of grammar, the generative tradition has in general given relatively little attention to the issue of semantics. In this view it is considered necessary to isolate semantics and structure, so that structure may be defined independently of any semantic or pragmatic context in which it might appear, for language was presumed to represent the *structural repertoire* of the set of possible messages. The manner in which sentences may be related to meaning and employed in actual performance is considered a separate issue altogether.

It may be noted that Shannon had employed a similar strategy in isolating structure and semantics. Shannon writes: "Frequently the messages have *meaning*; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantic aspects of communication are irrelevant to the engineering problem" (Shannon 1949:3). Chomsky followed, stating: "... the notion of "grammatical" cannot be identified with "meaningful" or "significant" in any semantic sense" (Chomsky 1957:15). He continues: "Despite the undeniable interest and importance of semantic and statistical studies of language, they appear to have no direct relevance to the problem of determining

or characterizing the set of grammatical utterances. I think that we are forced to conclude that grammar is autonomous and independent of meaning” (Chomsky 1957:17).

While it is not an exact parallel with Weaver, the modular semantic component Chomsky introduced in his (1965) *Aspects of the Theory of Syntax* is in some respects reminiscent of Weavers independent semantic receiver and semantic noise input.²⁸ Weaver writes:

One can imagine, as an addition to the diagram [see figure 3.6], another box labeled “Semantic Receiver” interposed between the engineering receiver (which changes signals to messages) and the destination. ... Similarly one can imagine another box in the diagram which, inserted between the information source and the transmitter, would be labeled “semantic noise” (Weaver 1949b:115-116).

The effect of Chomsky’s describing language via the conditions spelled out in Shannon’s information theory was a restricted definition of language and associated elevation of grammar. Whereas earlier linguists had concerned themselves with language as the *langue* of respective speech communities, in the generative tradition language was simply the product of grammar. Concerning this restricted definition, Simpson writes:

A particular use of the phrase ‘a language’ is that of transformational-generative grammar where a language is held to be an infinite set of sentences, each sentence being finite in length and constructed out of a finite set of elements. This view ... is thus able, it is claimed, to give a precise definition of a language; for a language is seen to be the output of the grammar that can construct the set of sentences constituting the language: consequently, a given language can be defined as that which a given grammar produces. (Simpson 1994:1896-1897)

In code model terms, then, generative linguistics views the grammar as the code used to *generate* the language. More importantly to the history of linguistics, the code (as grammar) is made the focus of attention.

4.4.1.1.2 An abridged model of communication

A restricted definition of language such as Chomsky suggested would also require an adjustment to the code model of communication. The particular adjustment performed may be characterized as an abridgement, for it shortened the expression while keeping the elements generative linguistics considered relevant. The first hint of such an abridgement occurs in Chomsky (1965), where he writes of speaker-listeners. Of all Chomsky has written and said concerning linguistics, it is unlikely that any quotation is better known (or more debated) than the following paragraph.

Linguistic theory is concerned primarily with an ideal speaker-listener, in a completely homogeneous speech-community, who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance. This seems to me to have been the position of the founders of modern general linguistics, and no cogent reason for modifying it has been offered. To study actual linguistic performance, we must consider the interaction of a variety of factors, of which the underlying competence of the speaker-hearer is only one. In this respect, study of language is no different from empirical investigation of other complex phenomena. (Chomsky 1965:3, 4)

Perhaps the most common argument directed toward this quotation concerns the issue of context, stating that it is inadequate to study language apart from context. Nevertheless, most critics remain satisfied with the dichotomization of competence and performance, just as preceding generations accepted Saussure's dichotomization of *langue* and *parole*. They simply debate over the *relative* significance of competence and performance.

The other major line of argumentation contests Chomsky's position that linguistic theory had been and should be concerned primarily with the ideal situation, to the relative neglect of language use in real world contexts. However strong the arguments to the contrary, it is obvious by now that many did agree with Chomsky's suggestion, for an entire school of thought developed around this and related premises.

How did Chomsky come to focus on competence when the broader question of communication was at stake? How did he set aside the problems of real communication in favor of an abstracted, idealized speaker-listener (later “speaker-hearer”) and a hypothetical homogenous speech community?²⁹ The key to these questions lies in a related quotation from Chomsky and Halle’s (1968) *The Sound Pattern of English*.

Chomsky and Halle’s (1968) *The Sound Pattern of English* was not directly related to information theory and its applications, as was Chomsky’s (1956) *Three Models* and (1957) *Syntactic Structures*. Accordingly, the logical relationships between that theory and information theory are not as immediately evident. Nevertheless, Chomsky and Halle clearly maintain, and in fact bolster the code model account of communication.

The first chapter of *The Sound Pattern of English* is titled “Setting.” The first two paragraphs of that chapter do, in fact, create the setting for the theory which followed:

The goal of the descriptive study of a language is the construction of a grammar. We may think of a language as a set of sentences, each with an ideal phonetic form and an associated intrinsic semantic interpretation. The grammar of the language is the system of rules that specifies this sound-meaning correspondence.

The speaker produces a signal with a certain intended meaning; the hearer receives a signal and attempts to determine what was said and what was intended. The performance of the speaker or hearer is a complex matter and involves many factors. One fundamental factor involved in the speaker-hearer’s performance is his knowledge of the grammar that determines an intrinsic connection of sound and meaning for each sentence. We refer to this knowledge—for the most part, obviously, unconscious knowledge—as the speaker-hearer’s “competence.” Competence, in this sense, is not to be confused with performance. Performance, that is, what the speaker-hearer actually does, is based not only on his knowledge of the language, but on many other factors as well—factors such as memory restrictions, inattention, distraction, nonlinguistic knowledge and beliefs, and so on. We may, if we like, think of the study of competence as the study of the potential performance of an idealized speaker-hearer who is unaffected by such grammatically irrelevant factors. (Chomsky and Halle 1968:3)

In this quotation one finds an appeal to the code model and, more importantly, statements regarding Chomsky’s and Halle’s proposed *rules* for how the code model

should be used to guide the research questions of the discipline. (These will be addressed following discussion of the quotation.)

The first paragraph of the quotation was addressed in the preceding section. In this paragraph Chomsky and Halle reiterate the restricted definition of language and the elevation of grammar as the code specifying the sound-meaning correspondence. The paragraph serves to identify Chomsky and Halle's focus of attention. The broader problem of the code model proper is addressed in the second paragraph. Consider now the first three sentences of the second paragraph. (These sentences are quoted individually in conjunction with discussion of the same.)

- The *speaker* produces a signal with a certain intended meaning; the *hearer* receives a signal and attempts to determine what was said and what was intended. (Chomsky and Halle 1968:3, italics added)

This comment identifies the notion of "communication," *per se*, as being fundamentally related to the concept of "language" developed therein. It should be clear that the sentence is an appeal to the code model of communication. It does not use the words "encode" or "decode," but otherwise the model appears in a classic form, including the use of "signal." More importantly, however, is the fact that in this sentence the model appears in what may be called its *expanded form*. "Expanded" refers to the fact that, in this particular sentence and its appeal, Chomsky and Halle leave the speaker (encoder) and hearer (decoder) in their independent roles; they are connected via the signal, but are still on opposing sides of that signal. In such an expanded form the roles of encoder and decoder are identified as being independent and distinct.

As shall be discussed in chapter 5, the notion of a fixed and shared code creates an anomaly for code model linguistics; the differences in "codes" maintained by speaker and hearer in real world communicative situations presents a serious conflict for the code model account. Accordingly, in the classic expanded model, the gravity of the fixed-code

anomaly is difficult to overlook. The complexity of such issues is briefly mentioned in the next sentence from Chomsky and Halle (1968), but note that in this sentence they have begun to focus in on a particular part of the larger model. Also note that the independent tasks of the speaker and hearer are conflated under the issue of performance.

- The performance of the *speaker or hearer* is a complex matter and involves many factors. (Chomsky and Halle 1968:3, italics added)

In conflating the tasks of speaker and hearer under the question of performance, Chomsky and Halle imply that the roles of speaker and hearer need not be considered distinct. In the process, they bring the encoder (speaker) and decoder (hearer) closer together. By the third sentence in the paragraph the encoder and decoder are conflated into a single entity. "Performance" is repeated, providing continuity and adding weight, while competence begins to emerge through the reference to knowledge.

- One fundamental factor involved in the *speaker-hearer's* performance is his knowledge of the grammar that determines an intrinsic connection of sound and meaning for each sentence. (Chomsky and Halle 1968:3, italics added)

With this sentence, then, Chomsky and Halle have abridged the code model, so that the independent roles of speaker and hearer in the expanded form have been exchanged for the *individual* speaker-hearer. The significance of this abridgement to the larger model should not be underestimated. Chomsky and Halle have interpreted the two "halves" of the model as being equivalent, albeit inverse processes. This idea is logically related to Shannon's description of the electronic receiver. Shannon writes, "The receiver ordinarily performs the inverse operation of that done by the transmitter, reconstructing the message from the signal" (Shannon 1949:6). This assumption, when applied to human communication, has contributed to a focus on the speech-generation side of the model, a focus generally identified as monodirectionality.

Abriding the code model of communication in this way allowed Chomsky and Halle to algebraically reduce the larger equation regarding the process of communication, yielding the smaller equation regarding *knowledge* of language, the output of grammar.

By the fourth sentence in the paragraph the notion of “speaker-hearer” is fixed and “competence” comes clearly into focus.

- We refer to this knowledge—for the most part, obviously, unconscious knowledge—as the speaker-hearer’s “competence.” (Chomsky and Halle 1968:3, italics added)

Since the encoder and decoder have now been subsumed under the rubric of speaker-hearer, the fixed-code anomaly is no longer an issue. Similarly, the complexity of the communicative situation is no longer an issue. Accordingly, Chomsky and Halle dismiss performance, and in the process circumnavigate several potentially injurious anomalies supported by the code model. They further clarify their distinction between competence and performance in the next sentence.

- Competence, in this sense, is not to be confused with performance. Performance, that is, what the speaker-hearer actually does, is based not only on his knowledge of the language, but on many other factors as well—factors such as memory restrictions, inattention, distraction, nonlinguistic knowledge and beliefs, and so on. (Chomsky and Halle 1968:3)

In the final sentence, all concerns but competence are dismissed as “grammatically irrelevant.”

- We may, if we like, think of the study of competence as the study of the potential performance of an idealized speaker-hearer who is unaffected by such grammatically irrelevant factors. (Chomsky and Halle 1968:3)

Recall that in the classic code model, what Chomsky and Halle call “competence” is knowledge of the grammatical code. The final sentence of the paragraph serves to clearly identify what Chomsky and Halle considered the heart of theoretical linguistics, that is, the study of the internal code.

Through these first two paragraphs of *The Sound Pattern of English*, Chomsky and Halle defined their rules for how the code model should be used in defining the primary research problem of linguistics. They focused their attention, and subsequently the attention of many other linguists, on a single component of the larger model. Over the years many have objected to this focus of attention and its associated neglect of other areas.

For the purposes of this study, however, the important thing to notice is that those arguing against Chomsky and Halle, or against Chomsky independently, rarely if ever argued against their presuppositions regarding communication or their general appeal to the code model of communication. Rather, criticism was generally directed at the *rules* Chomsky and Halle proposed for how to use that model.

Having explored introductory paragraphs from *The Sound Pattern of English*, the discussion now returns to the famous sentence from *Aspects of the Theory of Syntax*.

Linguistic theory is concerned primarily with an ideal speaker-listener, in a completely homogeneous speech-community, who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance. (Chomsky 1965:3, 4)

While this quotation does not demonstrate the steps involved in the reduction of the code model as does the quotation from Chomsky and Halle (1968), it does demonstrate a similar effort to factor out all problems, noise, and real-world distractions which are considered to hinder the effectiveness of communication. As has been discussed, the code model describes communication as an event which, provided such "grammatically irrelevant" factors are removed, should produce a decoded message which matches exactly the originally encoded message. It is presumed that the encoded message and the decoded message would be exactly the same since, in such a homogenous speech

community, every person's competence (that is, his knowledge and ability to control the grammatical code) would be exactly the same.

Although no ideal speaker-hearer and homogenous community was to be found, the abridgement of the code model and the uniting of speaker and hearer would provide both. In merging the previously distinct roles and tasks of speaker and hearer, Chomsky performed a methodological *coup d'état*, awarding himself (and the linguist generally) the ability to be his own language informant and elevating the notion of speaker intuition to previously unknown heights. In that view it mattered little that there was no such thing as a homogenous community, for by simultaneously serving as both informant and linguist, he could be his own ideal speaker-hearer, and the only (and therefore certainly homogenous) member of the speech community. Since the method need not involve actual communication, the study of performance and its "grammatically irrelevant" problems were easily characterized as superfluous. Finally, having "purified" the access to an individual's grammar, it seemed plausible to argue that this access could yield access to the grammar of human language generally, that is, universal grammar, without requiring the linguist to study the breadth of human language in real world communicative contexts. While this methodological adjustment was not a patch in the sense of *adding* something to the code model account, it nevertheless served a similar function; that is, it was an attempt to handle areas which were recognized as being anomalous.

4.4.1.2 Stratificationalists

While the role of the code model of communication has been somewhat obscured in the generative tradition, it is much more obvious in the stratificational tradition of linguistics. The same may be said of the role of the Saussurean influence within stratificational linguistics. Consider, for example, the following comments from Sidney Lamb, which clearly involve a Saussurean notion of relationship:

A language may be regarded as a system of relationships. As such, it is not directly observable. The linguist can only observe the manifestations of linguistic structure, i.e., samples of speech and/or writing, and the situations in which they occur. Yet, SG strives to generate a specific text in a specific situation. (Lamb 1966:3)

Stratificational linguistics characterizes linguistic structure as being organized into layers, or strata. Building upon Saussure's notion of structure being organized via syntagmatic and paradigmatic relations, stratificationalists propose that each layer has its own rules of syntax, labeled tactics, and that each layer is related to others through relationships, labeled realizations. All stratificationalists employ this notion of strata, but they do not all agree regarding the number of strata involved. As Algeo points out, the major investigators consistently employ at least three particular strata: the semiological, the grammatical, and the phonological (Algeo 1973:6). But, Edmondson and Burquest note in their review of stratificational linguistics, the number of strata employed by any one investigator has varied from three to six (1998:97).

In contrast to Saussure, however, stratificationalists do not strictly dichotomize the concerns of structure and the concerns of context. They purport to be accounting for communicative acts, rather than simply structure. In this regard, stratificational accounts attempt to address several issues which Chomsky (1965:3-4) had regarded as "grammatically-irrelevant." Sullivan writes:

The immediate aim of SG is to account for the production and deciphering of spoken or written texts of arbitrary length. This includes what is produced, how it may be produced, what is understood, and how it may be understood, including pragmatic and sociocultural purposes of the discourse. If possible, the model used should also give insight into language acquisition and language change. In any case, the model used must be internally consistent in a logical sense and must not contradict anything we know about the structure and operation of the brain. Note that this is a requirement, not a claim that SG is a neurological theory of language.

The long-term aim of SG is to account for language and language use as a portion of general cognitive-neurological functions. This includes logical and nonlogical thought, slips of the tongue, troublesome ellipses of all kinds, communicative grunts, etc. This suggests to me that linguistics will ultimately have to develop a neurological theory of language. (Sullivan 1980:301-302)

Edmondson and Burquest (1998) explain:

Stratificationists make it quite clear that they are not interested in describing some platonic ideal, the essence of reality only imperfectly realized in the real world. Yet, on the other hand, they also wish to describe something free of extralinguistic disturbances (though deciding what is extralinguistic may be difficult). Lockwood (1972:10) speaks of ideal performance, which is to contain competence "... plus conventions for its activation." Thus, they would strive to study not only the knowledge of a speaker but also all linguistically significant factors involved in putting this knowledge to use. There should be a direct relationship between competence and performance. And, moreover, as Lamb recently described it, the position of SG is to describe a typical speaker-hearer in a diverse speech community. (Edmondson and Burquest 1998:95)

Whereas generativists rarely address communication *per se*, stratificationists do so regularly. The fact that stratificationists maintain an expanded form of the code model also makes it easy to identify respective components of that model. As quoted in section 2.4, Lockwood appeals to the code model concepts of communication. In contrast to certain other stratificationists, however, his account employs little of the classic information theoretic terminology, drawing instead from Saussure's speech circuit model:

Communication through the medium of spoken language is concerned with the conveying of concepts by means of vocal noises. Let us attempt to outline a simple view of what goes on when two individuals communicate using language. One participant in the communication process, let us label him A, goes from concepts inside his brain to muscle movements leading to the articulation of vocal sounds. A second participant, B, receives these vocal noises as they have been transmitted through the air. He perceives them by means of his auditory mechanism, which ultimately leads to a stimulation of his conceptual apparatus. (Lockwood 1972:1)

Ilah Fleming, also quoted previously, provides a more classic appeal to the model:

In a stratificational view of communication, there are a number of strata, each of which represents a different aspect of the communication system. The stratal levels are, by convention, ordered vertically in diagrams with content at the top and means of expressing the content at the bottom. If the dynamic use of the strata is to encode a message, the communicator starts with the content of his message at the top and encodes it through the relevant strata until it is expressed ultimately by the lower expression level strata with sounds, non-verbal body movements, writing and/or other signals. If an audience wants to decode a message, he starts with input from the expression level and decodes through the relevant strata until he is able to decode the content of the message. The success of the communication is affected by the degree to which the

inferred message of the decoder matches the intended message of the encoder. (Fleming 1990:25; preliminary edition, quoted with permission)

It should be noted, however, that in her approach to stratificational linguistics, which she calls, "communication analysis," Fleming employs a rather holistic approach to the general problem of communication, and in so doing addresses several areas which are not typically considered in code model linguistics. Her five areas of concern include: (1) communication situation—culture, language, social setting, social relationship; (2) semantic; (3) morphosyntax; (4) expression level—graphemic, phonemic, prosodic, and kinesic; and (5) physical phenomena—hand movements, auditory perception, articulatory movements, visual, tactile perception. She also lists a sixth concern, the transmission channel, although this is not incorporated into a stratal level as are the other five (Fleming 1990:3, 27, also see Edmondson and Burquest 1998:112).

The result of this characterization is a speech chain version of the code model (see again figure 3.8). As Fleming describes it, several different kinds of organizational structures "form a connected network when woven together to encode a communication act" (Fleming 1988:2).

4.4.1.3 Sociolinguists

Considering the contrasts sociolinguistics presents when compared to formal approaches to language, many might suspect that sociolinguists avoids use of the code model. In fact, sociolinguists often do employ the code model. The relationship sociolinguistics bears to the code model is, however, somewhat complex. That relationship can be described as involving two major issues: (1) struggling with disciplinary rules proposed by siblings in the Saussurean paradigm, and (2) struggling with anomalies supported by the model itself.

4.4.1.3.1 Struggling with rules

One cannot read far in sociolinguistic literature without contacting examples of sociolinguists defining their subdiscipline via negative definition. That is, they first describe the dominant view regarding language, and often the generative view in particular, and then use that as a basis for describing how sociolinguistics is different. Having been invented and developed during the same era as generative linguistics, sociolinguistics has been overshadowed by the attention given to its generative sibling in the Saussurean paradigm. The attention itself probably would not be problematic for sociolinguists; rather, the rivalry concerns particular rules proposed by leading linguists of the generative tradition. As discussed in section 4.4.1, Chomsky (1965) and Chomsky and Halle (1968) reduced and abridged the code model of communication, proposing in the process several rules for how the code model should guide investigation. Many other linguists have shared the general approach of idealization and abstraction, even if they do not fit within the generative tradition.

Fasold (1986) serves as an example of such a negative definition, in that he characterizes linguistic analysis as being of three types and then unites two and describes the sociolinguistic position as opposed to their shared position. Figueroa summarizes that characterization as follows:

Fasold 1986 has noted that there are three kinds of linguistic analyses based on, one, a biological definition where the concern is with the "language acquisition device" or the "language faculty" in the brain (Chomsky 1986); two, a social definition of language where the concern is with language users and language in "context" (see, e.g. Schiffrin 1987); and three, a platonic definition of language where the concern is not with mental states, knowledge or social action but abstract objects and mathematical principles (Katz 1981). Fasold notes, however, that *in practice* the first and third types of linguistic analyses, despite their theoretical differences, end up being the same A primary reason why the two are the same in practice is because their object of study is the same: sentences (whether abstract without reference to psychology or idealized but psychologically real), and that why they differ (or should differ) from the contextual approach, is that this approach is concerned with utterance, which by its very nature is contextualized. (Figueroa 1994:5)

Figuroa employs a similar characterization, but she also addresses the broader historical tradition of which generative linguistics is simply the contemporary instantiation. As quoted in section 4.3, Figuroa identifies the Saussurean paradigm of linguistics, calling it "received linguistics." She recognizes that, as contrasted to received linguistics, sociolinguistics is working the margins. She writes: "Received linguistics, then, is the normal science assumptions about the object of linguistic enquiry, the core values of linguistics, in relation to which sociolinguistics is usually positioned on the periphery" (Figuroa 1994:10).

Figuroa points out that definitions of sociolinguistics all "emphasize variation and diversity; the socio-cultural nature of language; and that the focus of sociolinguistics should be on *parole*/language use, interaction and meaning" (1994:2). Placed in contrast to the dominant view which emphasizes grammatical studies, such definitions are always the *other*, the non-dominant perspective, perpetually justifying their existence. This pattern is played out throughout Figuroa's survey as she repeatedly defines sociolinguistics approaches via contrast with "received linguistics."

In considering this rejection of rules, it is important to understand that sociolinguists have not rejected the code model itself. For example, consider the following quotations from John Gumperz. (The first does not employ the code model, *per se*, but does refer to semiotic concerns.)

When linguists speak of language structure they generally refer to abstract features derived by decontextualizing procedures which take into account only a portion of the totality of communicative signs that may enter into the interpretation of communicative acts. (Gumperz 1982:16)

The second quotation clearly makes an appeal to the code model of communication, also doing so in the context of discussing the rules defined by the dominant perspective.

Interpretation always depends on information conveyed through multiple levels or channels of signalling and involves inferences based on linguistic features that from the perspective of texts based analysis count as marginal or semantically insignificant. (Gumperz 1982:207)

The point here is that sociolinguistics is a branch of the Saussurean tradition. As such, the Saussurean paradigm has passed on to sociolinguistics a theory of communication influenced by that paradigm's contemporary characterization of communication, that is, the code model of communication and the axioms of code model linguistics as described in section 3.4. Sociolinguists generally accept that inheritance. In general, the only axiom with which they conflict is that defining the linguists' problem: "The linguists' problem lies (primarily) in defining the code and (secondarily) in defining the processes of transmission and reception." Even in that the rejection is only partial. They don't typically reject the emphasis on code or transmission and reception processes. They simply differ with their generativist colleagues regarding methodology and focus of study. That is, they address the processes of transmission and reception in similar manner, but they insist that the code is social and therefore must be studied in social context. While this interest in actual use and context draws sociolinguists' attention toward *parole*, the system remains their focus of study. Accordingly, their interest may, in fact, be better characterized as an interest in *langue*. Joseph characterizes the problem in a productive way:

In terms of Saussurean traditions, sociolinguistics pursues the Saussurean view of the social nature of *langue*, while Chomskyan generative linguistics (to which sociolinguistics has stood in irreconcilable contrast for a generation) pursues the Saussurean view of the mental and abstract nature of *langue*. An eventual reconciliation of this split—to which a deeper understanding of Saussure's thought may provide a clue—would certainly constitute a major breakthrough in the understanding of language. (Joseph 1994:3666)

While this author is not so presumptuous as to suggest that this study is the simple key to reconciling sociolinguistic and generative approaches, it is not unreasonable to suggest that at least part of this conflict between the two approaches stems from differing

responses to the code model of communication. As discussed, generative linguistics reduces the code model in order to focus on grammar. Sociolinguistics, in contrast, keeps the expanded form of the model, all the while wrestling with the anomalies it entails for sociolinguistic study. One may wonder if this contrast would have developed *without* the code model as a foundation, and similarly, could a different model of communication bring about resolution.

4.4.1.3.2 Struggling with anomalies

The fact that sociolinguists differ from generativists regarding methodology and focus is news to neither the sociolinguists nor generativists. But for many sociolinguists, at least, the fact that they share a model of communication with generativists may come as somewhat of a surprise. The fact that the generative tradition employs the model in an abridged form has, to some extent, obscured that fact.

It is important to understand that sociolinguists have made no concerted rejection of the code model of communication. While sociolinguists may have argued against the characterization of language expounded by generativists, they have rarely argued against the *concept* of language expounded in the code model (and by the Saussurean paradigm generally). In contrast, they generally propagate that view. As quoted previously, Wardhaugh writes: "When two or more people communicate with each other in speech, we can call the system of communication that they employ a code. In most cases that code will be something we may want to call a language" (1986:1).

Sociolinguists do not seem to realize that many of the anomalous issues with which they struggle extend from the code model itself more so than from the generative characterization of language. That is why, as Figueroa notes, their contention is with the received position (that is, the Saussurean paradigm), and not simply with the most recent censure of generative linguistics. Because it depends upon the notion of a shared code,

the code model cannot adequately account for variation in a speech community. Because it depends upon the notion of a fixed code, it cannot adequately account for variation in individual usage. And since it describes communication as simple encoding and decoding events, it does not recognize the relevance of context at all. Of course, each of these issues is of major concern to sociolinguists.

The code model of communication starts the sociolinguist off "with one hand tied behind his back." To begin with, he is not equipped with an adequate model upon which to construct his inquiry. When he explores areas outside the predictions of that model, and finds himself struggling with issues such as variation and context, he then finds himself having to justify the conflict his inquiry and hypotheses engender for a larger paradigm community built around that model.

Consider, for example, the following quotation from Wardhaugh (1986).

The competence-performance distinction just mentioned is one that holds intriguing possibilities for work in linguistics, but it is one that has also proved to be most troublesome, particularly when much of the variety that is so interesting within language is labeled 'performance' and then brushed to one side by those who consider 'competence' to be the only valid concern of linguists. The language we use in everyday living is remarkably varied. In fact, to many investigators it appears that it is that very variety which throws up serious obstacles to all attempts to demonstrate that each language is at its core, as it were, a homogeneous entity, and that it is possible to write a complete grammar for a language which makes use of *categorical rules*, i.e., rules which specify exactly what is—and therefore what is not—possible in the language. Everywhere we turn we seem to find at least a new wrinkle or a small inconsistency with regard to any rule one wishes to propose; on too many occasions it is not just a wrinkle or inconsistency but actually a glaring counter-example. When we look closely at any language, we will discover time and time again that there is considerable internal variation, and that speakers make constant use of the many different possibilities offered to them. No one speaks the same way all the time, and people constantly exploit the nuances of the languages they speak for a wide variety of purposes. The consequence is a kind of paradox: while many linguists would like to view language as a homogeneous entity and each speaker of that language as controlling only a single style, so that they can make the strongest possible theoretical generalizations, in actual fact that language will be seen to exhibit considerable internal variation, and single-style speakers will not be found (or, if found, will appear to be extremely 'abnormal' in that respect, if in no other!). (Wardhaugh 1986:5)

This quotation comes only four pages after Wardhaugh's assertion that people employ a code in communicating, and that this code is something we may call a language (1986:1). Note, as well, that Wardhaugh has directed his argument against generative linguistics, rather than identifying the core struggle as being with anomalies of the code model itself. Such anomalies will be addressed in some detail in chapter 5.

4.4.1.4 Functional-Typologists

Functional-typological linguistics is represented primarily by the work of Talmy Givón. Being a functionalist, Givón disagrees with formalists in regard to the origins and structure of the code. Nevertheless, he continues the Saussurean tradition in treating language as a code.

Having provided a rather critical review of transformational-generative tenets (1984:6-9), Givón positions himself in contrast to that tradition. He describes his approach to syntax as a having "developed gradually as a rejection of all the tenets of the transformation-generative tradition," (1984:9; see 6-9). He then introduces his own approach as follows:

It feeds on the functionalism inherent in Jespersen, Bolinger and the Prague School. It draws from Greenberg's typological approach to the study of structural and functional universals. It embraces a more Piagetian mentalism which views language and communication as part and parcel of cognition. It is inherently developmentalist in recognizing the determinative role of language acquisition, language change and language evolution in shaping extant language, culture and cognition. It is pragmatically-based and rejects formalism for formalism's sake, recognizing instead the open-ended, contingent and less-than-categorical nature of language, behavior and cognition. It strives to establish an empirically-motivated balance between the relative roles of input and innards—or percepts and concepts—in language acquisition and communicative behavior, stressing pragmatic, constructivist interaction between environment and mind. It views language in its biological-social-cultural context, refusing to artificially adjudicate between these three function-laden spheres. Finally, it is a determinedly empirical approach, rejecting Chomsky's "competence" as anything except a useful preliminary/methodological heuristic in approaching a complex data-base. It views data of language use, variation, development, behavior, discourse processing and experimental cognitive psychology as part and parcel of one

empirical complex. Within this complex, the study of sentences/structures in isolation certainly plays an important and methodologically prior role, but by no means a prime role, in understanding the vast network of phenomena called human language. (Givón 1984:9-10)

To the extent that Givón is able to achieve these goals, his approach does attempt to integrate various elements of language and language use which have heretofore been isolated. Furthermore, he does attempt to account for areas which are anomalous for code model linguistics, areas such as variation, context, and discourse processing. This does not mean, however, that he has abandoned the code model or code model axioms. It is in fact clear that he has not. For example, he writes:

Syntax is the study of a unique and complex *coding system*. 'Coding' is a binary expression designating two entities holding a peculiar *semiotic* relation, at least as far as language is concerned:

- (a) The coded entity: Meaning, message, function
- (b) The coding entity: Sign, code, structure (Givón 1986:29)

As is the case with many sociolinguists (see the preceding section) Givón does not seem to realize the extent to which his struggle is against the code model of communication and its anomalies, rather than simply against the generative tradition. He does view language as a coding system and makes multiple appeals in that regard. In his view, the problem is not with the notion of coding so much as it is with an overly simplistic coding system. As quoted previously from his *Mind, Code, and Context: Essays in Pragmatics*, Givón (1989) suggests that certain limitations of formal linguistics can be overcome by positing a more *elaborate* notion of code:

In the discussion thus far I have deliberately followed a tradition that must now be transcended. That tradition, in discussing language as semeiotics ('coding system'), has been for a long time beclouded by almost total disregard for some rather fundamental facts concerning human language. Chief among those is the fact that language is a *complex, multi-level* code, rather than a relatively simple matching of sound sequences with lexical meanings. (Givón 1989:81)

In Givón's view it is necessary that the linguist account for coding in at least three areas. He writes:

If, for the moment, one sets aside the admittedly important socio-cultural, psycho-emotive and aesthetic functions of language, it is possible to recognize three major functional realms which receive systematic and distinct coding in human language:

- (a) Lexical semantics
- (b) Propositional semantics
- (c) Discourse pragmatics (Givón 1984:30)

Note, however, that he has also recognized important functions of language which do not fit within this proposed coding scheme.

It would seem at first glance that Givón demonstrates some awareness of information theoretic concerns. (His discussion of the coding of discourse pragmatics is titled "Information-theoretic preliminaries to discourse pragmatics."—Givón 1984:239) As is common among linguists, however, he does not differentiate information theory from the code model. In that section on discourse pragmatics he makes the following statements:

The sentence—or proposition—is the basic unit of information processing in human language. Smaller units, such as words, may carry meanings which are represented in the lexicon. They do not, however, carry information ('message') *per se*. Although they can stand for whole propositions and thus carry information, as in [the following example]:

- [(e.g.) a. *Question*: Who did it?
- b. *Answer*: The butler.

Further, information structure in human language most commonly involves units larger than the single proposition. In this sense human communication is multi-propositional. Another name used to refer to it is discourse, which whenever appropriate we can then break down into smaller hierarchic sub-units (story, chapter, section, paragraph, etc.). (Givón 1984:239)

Givón continues in the Saussurean tradition in maintaining the Saussurean notion of language as a shared coding system. Functional-typological grammar differs from its siblings in the Saussurean paradigm via its focus of attention and in its rules for engaging the language and communication problem. While it attempts to engage certain anomalies

of the paradigm, it does not seem that Givón has identified those anomalies as being an extension of the paradigm and the contemporary model of communication (the code model) that the paradigm employs.

4.4.1.5 Inferentialists

This section addresses the work of the inferentialist approach to the problem of communication developed by Dan Sperber and Deirdre Wilson, which they call relevance theory. Whereas certain other schools of thought considered in this study focus on developing details of the code model account, such as the nature of grammar, inferentialists focus upon the broader problem of communication. In particular, they wrestle with how the hearer moves from the reception of an articulated expression to comprehension.

As they explain, "all human beings automatically aim at the most efficient information processing possible" (Sperber and Wilson 1986:49). The effect of this economic constraint is the production of optimally minimal expressions, which rarely document each logical step involved in the discourse. In order to "fill in the gaps" between such minimal expressions, the speaker and hearer rely on principles of inference in both producing and comprehending these expressions. The way in which speakers and hearers manage and manipulate this process is the focus of interest for inferentialists.

While the concerns of inferentialists are certainly outside the normal range of interests defined by the Saussurean paradigm, this study nevertheless describes them as practicing normal science. While they do not consider the code model account to adequately address the problem of communication, they have not abandoned the model. As far as the encoding process is concerned, they are generally satisfied with the code model account of language. They would, however, modify the code model axiom that "Those receiving the text decode the message when they hear/read the text," by insisting

that the decoding process alone is not capable of producing comprehension. The inferential model of communication suggests that "communication is achieved by producing and interpreting evidence" (Sperber and Wilson 1986:2).

Rather than abandon the code model, inferentialists supplement the code model account via several patches. For Sperber and Wilson, this involves the principle of relevance and ostensive-inferential communication.

Sperber and Wilson build upon the work of a fellow inferentialist, philosopher Paul Grice, who supplies his own patch to linguistic communication. Grice is concerned with the idea of divergences in meaning between the logical operators of formal logical language and the verbs and conjunctions of natural language. In his view, apparent divergences can be accounted for via an understanding of conversational implicature. Grice writes: "I wish ... to maintain that the common assumption ... that the divergences do in fact exist is (broadly speaking) a common mistake, and the mistake arises from an inadequate attention to the nature and importance of the conditions governing conversation" (1975:43). In Grice's view, conversational implicature involves a cooperative principle and a set of maxims. Sperber and Wilson describe Grice's thesis as follows:

Grice's fundamental idea in his *William James Lectures* is that once a certain piece of behavior is identified as communicative, it is reasonable to assume that the communicator is trying to meet certain general standards. From knowledge of these general standards, observation of the communicator's behavior, and the context, it should be possible to infer the communicator's specific informative intention. (Sperber and Wilson 1986:33)

Grice himself writes:

Our talk exchanges ... are characteristically, to some degree at least, cooperative efforts; and each participant recognizes in them, to some extent, a common purpose or set of purposes, or at least a mutually accepted direction. ... at each stage, *some* possible conversational moves would be excluded as conversationally unsuitable. We might then formulate a rough general principle which participants will be expected (*ceteris paribus*) to observe, namely: Make

your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged. (Grice 1975:45)

This is Grice's *cooperative principle*, which he develops into nine maxims, classified into four categories. Sperber and Wilson (1986:33-34) list them as follows:

Maxims of quantity

- 1 Make your contribution as informative as is required.
- 2 Do not make your contribution more informative than is required.

Maxims of quality

- 1 Do not say what you believe to be false.
- 2 Do not say that for which you lack adequate evidence.

Maxim of relation

Be relevant.

Maxims of manner

- 1 Avoid obscurity of expression.
- 2 Avoid ambiguity
- 3 Be brief.
- 4 Be orderly

For Grice, then, inference itself involves a set of rules, or maxims, for how the communicative act is to be both delivered and, accordingly, interpreted.

While Sperber and Wilson admittedly draw from Grice's work on inference, there are several differences between Sperber and Wilson's principle of relevance and Grice's co-operative principle and maxims. Sperber and Wilson discuss the more significant of these differences as follows:

Grice's principle and maxims are norms which communicators and audience must know in order to communicate adequately. Communicators generally keep to the norms, but may also violate them to achieve particular effects; and the audience uses its knowledge of the norms in interpreting communicative behavior.

The principle of relevance, by contrast, is a generalisation about ostensive-inferential communication. Communicators and audience need no more know the principle of relevance to communicate than they need to know the principles of genetics to reproduce. Communicators do not 'follow' the principle of relevance; and they could not violate it even if they wanted to. The principle of relevance applies without exception: every act of ostensive communication communicates a presumption of relevance. It is not the general principle, but the fact that a particular presumption of relevance has been communicated by

and about a particular act of communication, that the audience uses in inferential comprehension.

However, the most important difference between Grice's approach and ours has to do with the explanation of communication. Grice's account of conversation starts from a distinction between what is explicitly said and what is implicated. No explanation of explicit communication is given; essentially, the code model, with the code understood as a set of conventions, is assumed to apply. Implicatures are explained as assumptions that the audience must make to preserve the idea that the speaker has obeyed the maxims, or at least the cooperative principle. [In contrast] The principle of relevance is intended to explain ostensive communication as a whole, both explicit and implicit. (Sperber and Wilson 1986:162-163)

Sperber and Wilson would likely reject the characterization of their model as a patch to the code model. They reject a similar assertion by John Searle (1969) in regard to Grice's cooperative principle and maxims, wherein Searle suggests that the principle and maxims are simply an addition to the code model account. In Sperber and Wilson's view, Searle's analysis "reduces Grice's analysis to a commonsense amendment to the code model. ... If Searle's revision is justified, then Grice's analysis is not a genuine alternative to the code model after all" (Sperber and Wilson 1986:25). In contrast, Sperber and Wilson argue that "If Grice is right, the inferential abilities that humans ordinarily use in attributing intentions to each other should make communication possible in the absence of a code. And of course it *is* possible" (Sperber and Wilson 1986:25).

Sperber and Wilson argue that the code model and inferential model need not be amalgamated, that is, that there is no need to conceive of communication as a unitary phenomenon (Sperber and Wilson 1986:24). They maintain "that there are at least two different modes of communication: the coding-decoding mode and the inferential mode" (Sperber and Wilson 1986:27). Furthermore, they are careful to characterize *their* "patch" as being of greater importance than coded communication, so that ostensive-inferential communication is presumed to be the dominant form of communication, simply being supported by coded communication.

Sperber and Wilson recognize that many people employ a conduit metaphor-based explanation of communication, and they are certainly aware of Saussurean semiology, as well as Shannon and Weaver's development of an information theoretic model (1986:1, 6-8, 4). But as discussed in chapter 3, they do not analyze the code model as having constituent models. Rather, they consider the code model to simply be the contemporary instantiation of an ancient theory of signs. The result of their limited analysis is that they keep the code model notion of coded communication. They simply contest the notion that in using coded communication the communicators *send* thoughts (Sperber and Wilson 1986:1). They are comfortable, however, with the notion that via encoding and decoding, communicators can *communicate* thoughts:

The view of linguistic communication as achieved by encoding thoughts in sounds is so entrenched in Western culture that it has become hard to see it as a hypothesis rather than a fact. Yet the code model of verbal communication is only a hypothesis, with well known merits and rather less well-known defects. Its main merit is that it is explanatory: utterances do succeed in communicating thoughts, and the hypothesis that they encode thoughts might explain how this is done. Its main defect, as we will shortly argue, is that it is descriptively inadequate: *comprehension involves more than the decoding of a linguistic signal*. (Sperber and Wilson 1986:6; italics added)

Rather than view communication as the process of sending thoughts, Sperber and Wilson suggest that communication is a process of guiding inference. As they state in this quotation, their main objection to the code model is in regard to how it accounts for comprehension of discourse. In their view, the processes of encoding and decoding alone cannot account for comprehension, for comprehension inevitably requires inference. As they explain, in guiding inference, the code model would require that speaker and hearer share common knowledge, or mutual knowledge as it is sometimes called (see Lewis 1969, Schiffer 1972). "The argument is that if the hearer is to be sure of recovering the correct interpretation, the one intended by the speaker, every item of contextual

information used in interpreting the utterance must be not only known by the speaker and hearer, but mutually known" (Sperber and Wilson 1986:18).

Clearly, speakers and hearers rarely, if ever, share such mutual knowledge. Sperber and Wilson accordingly write, "We see the mutual-knowledge hypothesis as untenable. We conclude, therefore, that the code theory must be wrong, and that we had better worry about possible alternatives" (1986:21). It is important to understand, however, that Sperber and Wilson are *not* rejecting the notion coded communication *per se*. (They later employ the notion of coded communication as a means of improving the odds of success for ostensive-inferential communication.) Rather, Sperber and Wilson are simply rejecting the code model explanation of *inference* because of its dependence on the notion of mutual knowledge.

Sperber and Wilson are not simply interested in the means by which inference is assembled (as was Grice), but also with the ways in which communicators attempt to direct or guide the inference of their communicative partners, thus their use of the term *ostension*. Concerning such behavior, they write: "We will call such behavior—behavior which makes manifest an intention to make something manifest—*ostensive* behavior or simply *ostension*. Showing someone something is a case of ostension. So too, we will argue, is human intentional communication" (Sperber and Wilson 1986:49). They provide the following definition of ostensive-inferential communication:

The communicator produces a stimulus which makes it mutually manifest to communicator and audience that the communicator intends, by means of this stimulus, to make manifest or more manifest to the audience a set of assumptions $\{I\}$. (Sperber and Wilson 1986:155)³⁰

Sperber and Wilson see coded communication as the most accurate means of guiding inference, but in their view it is certainly not the only medium employed in this process; rather, the communicators have a broad inventory of means by which they can

guide the inference of their communicative partners. Furthermore, communication need not necessarily involve coded communication; other media can be employed without evoking the linguistics code. Coded communication simply narrows the range of logical interpretations available to the communicative partner.

In Sperber and Wilson's view, then, communication typically involves two types of communication: coded and ostensive-inferential. Ostensive-inferential communication is considered to be the dominant type of communication. Coded communication is considered a supplement to the O-I type, rather than the inverse. They write:

We regard verbal communication, then, as involving two types of communication processes: one based on coding and decoding, the other on ostension and inference. The coded communication process is not autonomous: it is subservient to the inferential process. The inferential process is autonomous: it functions in essentially the same way whether or not combined with coded communication (although in the absence of coded communication, performances are generally poorer). The coded communication is of course linguistic: acoustic (or graphic) signals are used to communication semantic representations. The semantic representations recovered by decoding are useful only as a source of hypotheses and evidence for the second communication process, the inferential one. Inferential communication involves the application, not of special-purpose decoding rules, but of general-purpose inference rules, which apply to any conceptually represented information. (Sperber and Wilson 1986:175-176)

Sperber and Wilson see no need for the entire set of rules which Grice proposed. Rather, they focus upon the maxim of relation, that is, "Be relevant." But in contrast to Grice, who held that such maxims must be cooperatively held by communicative partners, Sperber and Wilson describe the principle of relevance not as a rule, but as an automatic function of ostensive communication. In their view, "an act of ostensive communication automatically communicates a presumption of relevance" (1986:156). Every act of communication involves a situation wherein "The communicator intends to communicate a set of assumptions $\{I\}$ " (Sperber and Wilson 1986:157). Any attempt to communicate, then, presumes the following:

Presumption of optimal relevance

(a) The set of assumptions $\{I\}$ which the communicator intends to make manifest to the addressee is relevant enough to make it worth the addressee's while to process the ostensive stimulus.

(b) The ostensive stimulus is the most relevant one the communicator could have used to communicate $\{I\}$. (Sperber and Wilson 1986:158)

The principle of relevance can then be expressed as follows:

Principle of relevance

Every act of ostensive communication communicates the presumption of its own optimal relevance. (Sperber and Wilson 1986:158)

These principles are presumed to guide the inference of the hearer, just as they guide the communicative effort of the speaker.

In light of their obviously innovative views regarding inference and certain limitations of the code model, it is almost surprising that Sperber and Wilson supply a code model-oriented notion of language as a cognitive system. They write:

In the broadest sense, a language is a set of well-formed formulas, a set of permissible combinations of items from some vocabulary, generated by a grammar. In a narrower sense, a language is a set of semantically interpreted well-formed formulas. A formula is semantically interpreted by being put into systematic correspondences with other objects: for example, with the formulas of another language, with states of the user of the language, or with possible states of the world. A language in this narrower sense—the one we will use—is a grammar-governed representational system. (Sperber and Wilson 1986:172-173)

They are careful, however, to define language as essential to cognition, but not as essential for communication.³¹

The activities which necessarily involve the use of a language (i.e., a grammar-governed representational system) are not communicative but cognitive. Language is an essential tool for the processing and memorising of information. ...

Language is not a necessary medium for communication: non-coded communication exists. Nor is it necessarily a medium for communication: languages exist which are not used for communication. However, language *is* a necessary attribute of communicating devices. Two devices capable of communicating with each other must also be capable of internally representing the information communicated, and must therefore have an internal language. In the case of ostensive-inferential communication, this internal language must be

rich enough to represent the intentions of other organisms, and to allow for complex inferential processes. (Sperber and Wilson 1986:173-174)

It is in writing of “non-coded communication” that Sperber and Wilson begin to move outside the Saussurean tradition. They are clearly pushing the limits of the Saussurean paradigm. They have not, however, quite reached “escape velocity.”

4.4.2 Revolutionary linguistics: abandoning the code model

Kuhn suggests that it is only when the attempts of normal science fail that scientists begin to recognize anomalies for what they are. He defines anomalies as phenomena “whose characteristic feature is their stubborn refusal to be assimilated to existing paradigms,” suggesting that “Paradigms provide all phenomena *except* anomalies with a theory-determined place in the scientist’s field of vision” (1996:97; italics added).

Kuhn suggests that if a new theory is to resolve the anomalies supported by an existing theory, then the new theory must permit a new set of predictions regarding the subject of study. These predictions must be different from those derived from the earlier theory. He adds that such a difference could not occur if the two theories were logically compatible. Accordingly, if it is to be assimilated by an established community, the new theory must displace the earlier theory (Kuhn 1996:97).

What are the anomalies supported by the code model of communication? Critics of the dominant paradigm suggest that the dominant perspectives on grammar and language are typically weak in three areas: the idealization involved, the relative neglect of semantics, and the extent of the divorce of performance and competence, with an inadequate account for performance (Donald A. Burquest 1997, personal communication). These weaknesses are in part related to dependence upon the code model of communication. This was notably true of early generative accounts with their exclusive emphasis on competence, but other schools of thought have been similarly limited. As has

been discussed, the notion of competence is closely related to the notion of *langue*, an integral element in the Saussurean perspective.

Theoreticians struggling with the code model identify additional problem areas, such as directionality, mechanistic concepts of encoding and decoding, intentionality, autonomy of the text, autonomy of the hearer, the abstraction of code, the importance of 'noise' and the communicative situation, and also the issues of variation, and inference as addressed in the previous section. While the approaches discussed in the previous section do address several anomalous areas, they retain the code model as a core component of their theory, simply attempting to "patch it up" through supplements or modifications.

In considering the following discussion of "revolutionary" approaches within linguistics, it is important to keep in mind the context in which the term revolutionary is employed. The question at hand is how the approaches are related to the code model of communication, which has been identified as a significant model in the contemporary metatheory of the Saussurean paradigm. In that context, approaches which attempt to abandon a code model account of linguistics and develop an alternative can be defined as revolutionary. This study will discuss three such approaches, the advocates of which call themselves emergent grammarians, and cognitivists, and integrationalists. Again, these approaches are selected as convenient examples. This study does not intend to imply that these are the only revolutionary approaches being explored in contemporary linguistics.

In considering these three approaches, it is important to keep in mind the distinction between the terms *revolutionary* and *revolution*. It is not the intention of this study to suggest that the theories and schools of thought reviewed in this section are evoking a *revolution* in the discipline of linguistics. That they are the focus of attention for their subdisciplinary community is clear, but that does not mean that the discipline as a whole will follow suit. Nor is it being suggested here that it necessarily should.

The previous comments notwithstanding, it should be noted that the way in which a community responds to a developing theory may be a function of the *moment* at which a theory is introduced. If an alternative or revolutionary theory is introduced before the community is ready, that is, before the community is generally aware of the anomalies being addressed, then the community will only consider those specific areas within the new theory which clearly overlap with areas in well established theories. The community may ignore areas which do not overlap, perhaps even questioning the very relevance of the areas which lie outside the established disciplinary focus. In this situation, a theory may "lie upon the shelf" unnoticed, only to be resurrected at a later date and hailed as revolutionary. In some situations, the theory will be spurned until the community is provided (or provides itself) the instrumentation necessary to create data sufficient to cause a disturbance in the established perspective.

As Hymes notes in developing the notion of *cynosure*, scientific revolution, if it is to occur, requires the focused attention of the community in question. Only history will tell how the larger disciplinary community will respond to the revolutionary developments of the emergent grammar, cognitive, and integrational schools of linguistics. Hymes (1974a) and Makkai (1993) have appropriately expressed concern over how some advocates of new theories use Kuhn's theory in marketing their own theoretical progeny as the "new paradigm." This author shares that concern, but in contrast to Hymes and Makkai, this study asserts that Kuhn's theory *can* be a very useful tool in the study of the discipline of linguistics, and particularly in regard to how the discipline has supported a particular constellation of commitments to metatheory and models.

4.4.2.1 Emergent grammarians

Emergent grammar is generally considered a functionalist approach. In contrast to the functional-typological approach authored by Givón, however, emergent grammar

theory, pioneered by Paul Hopper, does not seem to depend upon code model concepts. This does not mean that emergent grammarians have explicitly stated their rejection of the code model account of linguistics. In fact, this author has not found such statements; nevertheless, that rejection seems apparent in the manner in which they diverge from code model linguistics.³² Since linguistic literature has only scarcely addressed the code model in an analytical manner, it would be impractical to use explicit rejection of the model as a criterion for defining relationships to that model.

Edmondson and Burquest (1998) introduce their own review of emergent grammar with the following comments:

In 1985 Paul Hopper made a very unorthodox proposal about the origins and nature of grammar, by challenging the basic notion of generative transformational grammar that our grammatical knowledge was a given in advance and that the acquisition process is merely well-known work-in-progress toward the necessary goal of a complete set of grammatical rules (see Hopper 1988). (Edmondson and Burquest 1998:231)

In the code model account of communication, it is assumed that the speaker and hearer must share a grammatical code in order for communication to proceed. By logical extension, the code must be fixed, lest the speaker and hearer change their copy of the code and thereby render communication impossible. In order to assure this fixed status, the grammatical code held by the speaker is clearly separated from the performance of that speaker. Similar conditions are of course established in Shannon's information theoretic characterization of communication between electronic devices. More importantly for linguistics, these are conditions established in Saussure's notion of *langue*, and in his isolation of *langue* and *parole* (see section 3.2.2.1). While code model linguists rarely refer to Saussure, they retain these conditions through dependence upon the code model.³³ In emergent grammar theory, however, these conditions are not maintained. Grammar is

described not as a prerequisite to communication, but as a *byproduct* of communication.

Edmondson and Burquest comment:

The most startling idea in Hopper 1988 is that, contra Chomsky, grammars may not be fixed in advance in a manner that allows knowledge of sentence structure to extend to discourses, nor are these grammars complete, immutable, nor do they have sharp edges with black-white distinctions between grammatical and nongrammatical sentences. His position is that human language grammars are only sets of incomplete partials. (Edmondson and Burquest 1998:233)

Hopper writes:

... the name [emergent grammar stands] for a vaguely defined set of sedimented (i.e., grammaticalized) recurrent partials whose status is constantly being renegotiated in speech and which cannot be distinguished *in principle* from strategies for building discourses. (Hopper 1988:118)

Edmondson and Burquest note several contrasts between formal and functional approaches, and between generative and emergent accounts in particular. Two key distinctions are quoted here (Edmondson and Burquest 1998:231-232):³⁴

| | Formalists | Functionalists |
|---------|---|--|
| GRAMMAR | Rule sets producing "platonic" ideals that are immutable and given a priori as a result of linguistics universals and shared language experience in acquisition | Rules are incomplete and partial, only EMERGENT from discourse patterns by processes called GRAMMATICALIZATION, tendencies that become conventionalized as morpho-syntax |
| TIME | Grammars, at least in part, are fixed in time as are ideal laws of nature | Grammars are emergent in time and are (partly) universally developmental in tendency |

As discussed in section 3.4, it is an axiom of code model linguistics that "Languages (i.e., codes) are systematic, distinctive, and have an existence independent of any given speaker or hearer." This notion of language of course depends heavily upon

Saussure's notion of *langue* as being community property, and not accessible for change by any individual. In contrast to this view, Hopper and Traugott write:

First, when we speak of change, what is thought to be changing? We speak loosely of "language change." But this phrase is misleading. Language does not exist separate from its speakers. It is not an organism with a life of its own: rather, each speaker of a language has to learn that language anew. Change is replacement (Hoenigswald 1966), on the understanding that "replacement" does not entail strict identity of an earlier function or category with a later one. (Hopper and Traugott 1993:33)

Saussure fixed his notion of *langue* via his notion of values. The values component prevented the relationships in the *langue* from changing. Furthermore, since the *langue* was entirely a matter of form, with no links to any substance, there was no "leverage"

Emergent grammar, in contrast, sees language as being grounded in discourse. Discourse, then, provides leverage for change. Furthermore, since individual speakers and hearers will have had different experiences in discourse usage, grammatical usage is negotiated during each communicative experience. Hopper writes:

The notion of Emergent Grammar is meant to suggest that structure, or regularity, comes out of discourse and is shaped by discourse as much as it shapes discourse in an on-going process. Grammar is hence not to be understood as a pre-requisite for discourse, a prior possession attributable in identical form to both speaker and hearer. Its forms are not fixed templates, but are negotiable in face-to-face interaction in ways that reflect the individual speakers' past experience of these forms, and their assessment of the present context, including especially their interlocutors, whose experiences and assessments may be quite different. Moreover, the term Emergent Grammar points to a grammar which is not abstractly formulated and abstractly represented, but always anchored in the specific concrete form of an utterance. (Hopper 1987:142)

Edmondson and Burquest explain:

Grammars are negotiated among interlocutors within discourse. Grammars cannot be constructed from decontextualized sentences, but only from the function of language in larger and informationally rich and real discourse. Grammars are dynamic and developmental, changing over time, and there is in principle no real difference between rules of discourse that have emerged by grammaticalization and rules of sentences that once were rules of discourse. ... The negotiated and informationally-based ad hoc rules of discourse can in time

be projected down to the sentence level. (Edmondson and Burquest 1998: 233-234)

Hopper also comments upon the apparent misunderstanding some code model linguists have demonstrated in reviewing his approach.

Critics of “radical pragmatics”, and “functional grammar”, assume that they and those they oppose share a common view of language, that there is a pairing of autonomous (i.e., decontextualized) grammatical forms with “functions” (whatever they might be in the abstract), and that the only point of disagreement is whether these forms might be eventually derivable from “functions” or whether the forms must be described independently of “functions.” (Hopper 1987:140)

Although he does not identify it as such, Hopper has here commented on the relative incommensurability between the code model approaches and his own emergent grammar. Code model linguists may not immediately recognize that emergent grammar does not share basic building blocks of the Saussurean paradigm.

4.4.2.2 Cognitivists

In discussing cognitive grammar, it is important to identify just which tradition is being addressed, for several traditions have at various times been called cognitive.³⁵ This section addresses the cognitive grammar of Ronald Langacker, together with cognitive semantics as developed by George Lakoff and Mark Johnson. This cognitive approach is distinct from stratificational linguistics, which Lamb has occasionally called cognitive linguistics. It is also distinct from the “logical view” of language sometimes called cognitive linguistics. This study has already addressed stratificational linguistics. For the purpose of contrast, the “logical view” is also briefly reviewed.

Ungerer and Schmid (1996:x-xi), in their book *An Introduction to Cognitive Linguistics*, describe the logical view as contrasting with cognitive linguistics. As they explain it, the cognitive view is itself made up of three component views: the experiential

view, the prominence view, and the attention view. This study follows Ungerer and Schmid's general outline as a convenient means of reviewing the cognitive approach.

Ungerer and Schmid describe the logical view as follows:

The ultimate goal of this endeavour has been to establish a body of logical rules for generating the sentences of a language that are grammatically correct and semantically acceptable. For the individual words a set of 'objective' semantic features has been proposed which would guarantee that the words are inserted appropriately into the grammatical structure. Thus the meaning of *car* would be described with the semantic features 'inanimate', 'concrete', 'movable' and 'self-propelled'.

Assuming that the logical rules and objective semantic features which generate language are stored in our memory, it seems only natural to claim that they are of a mental nature. This approach is also 'cognitive' in the original sense of the word (i.e. 'related to knowledge'). However, it is not the kind of 'cognitive linguistics' ... [with which Langacker and his colleagues are concerned]. (Ungerer and Schmid 1996:x)

In the logical view, words are considered to have meaning independent of any particular speaker or hearer. The words are the property of the language, with the language defining rules for their use. This view is commonly held by code model linguists, who see grammar as a code defining the intrinsic relationship between meaning and structure. In this view, the speaker encodes meaning by following the logical rules of the language in assembling a linguistic structure. Correspondingly, the hearer decodes meaning by inversely applying the same set of logical rules.

While the logical view is a common view within contemporary linguistics, it is not the view espoused by linguists practicing cognitive linguistics as defined by Langacker. Rather than being based on logical rules, Langacker's view "is an approach to language that is based on our experience of the world and the way we perceive and conceptualize it" (Ungerer and Schmid 1996:x). Originally called 'space grammar', cognitive linguistics began in the late 1970s in investigations of how syntactic relationships reflected spatial perceptions of the speakers and hearers. It has been expanded to include investigation of various levels of grammar and, together with the contributions of Lakoff (1987) and

Lakoff and Johnson (1980, 1999), has become a general theory of language and cognition.

Langacker introduces the theory with the following comments:

In stark contrast to modular approaches, it regards language as an integral facet of cognition, and grammar as being inherently meaningful. It presupposes a 'conceptualist' account of linguistic semantics that properly recognizes our capacity for construing the same conceived situation in alternate ways. With an appropriate view of meaning, all grammatical elements are reasonably attributed some kind of conceptual import. Grammar is thus considered 'symbolic' in nature: it reduces to the structuring and symbolization of conceptual content. (Langacker 1994:590)

As envisaged in cognitive grammar, linguistic structure ultimately reduces to recurrent patterns of neurological activity, and owing to its multifaceted complexity, a language is more aptly likened metaphorically to a biological organism than to a computer program or a logical deductive system. (Langacker 1994:590)

In exploring the cognitive approach, it is helpful to consider the experiential, prominence, and attentional views independently.

4.4.2.2.1 Experiential view

The experiential view claims that, "instead of postulating logical rules and objective definitions on the basis of theoretical considerations," the linguist's attention is better directed toward the language users' experience. That is, cognitivists note that, when people are providing their own 'definitions' of items, properties, and relations, they do not limit themselves to logical rules and objective definitions; rather, "people include associations and impressions which are part of their experience." Some of these associations and impressions will be very personal and subjective, while others seem to be part of communal experience (Ungerer and Schmid 1996:xi).

The cognitive methodology for studying and describing these associations and impressions builds upon psychological studies of cognitive categories, in particular the work of Eleanor Rosch (see 1977, 1978), which led to the prototype model of categorization. This involves notions of attributes, family resemblances, and gestalts.

“Contrary to what one might assume, prototypes and cognitive categories are not static, but shift with the context in which a word is used and depend on the cognitive models stored in our mind” (Ungerer and Schmid 1996:xiii).

The experiential view postulates that experience, not logic, guides the language user's development of conceptions regarding items, properties, relationships about which we wish to make expression. Accordingly, experientially developed *conceptions*, not objective logic, define the semantic and grammatical relationships between the individual units of complex expressions. The language user conceives of various items and relations as being similar. He organizes abstract concepts (of items, states, or relations) by metaphorically associating them with more concrete experiences (of items, states, or relations). He may metaphorically extend an expression associated with one experience onto an experience he considers somehow similar or related. The verbal expression so produced will reflect such metaphorical extension, even though the sequence of individual sound patterns (words) may, in the logical view, be cumbersome to explain and may even be considered ‘ungrammatical’. Similarly, a language user may map onto already held conceptions various expressions which he hears, even though the expression may be unconventional and, in the logical view, may be considered ‘ungrammatical’.

Langacker writes:

Grammar consists of patterns for combining simple symbolic structures into symbolic structures of progressively greater complexity. ... Typically, one component structure corresponds to, and serves to ‘elaborate,’ a schematic substructure within the other. ...

It is useful for the composite structure to inherit its profiling from one of the component structures, which thereby constitutes the construction's ‘head.’ ...

Grammatical rules take the form of schematized constructions. A ‘constructional schema’ is a symbolically complex structure whose internal organization is exactly analogous to that of a set of constructions (complex expressions), but which abstracts away from their points of divergence to reveal their schematic commonality. ... A constructional schema may be characterized at any appropriate level of abstraction, and represents the conventionality of a particular pattern of integration. It is available for the categorization of novel

complex expressions and can be thought of as a template used in their assembly. (Langacker 1994:593)

This view of experience and cognition builds upon the work of Lakoff (1987) and Lakoff and Johnson (1980, 1999), wherein metaphors are not seen simply as ornamental figures of speech, but as conceptual tools (see again section 2.1). Concerning this foundation, Langacker writes:

Cognitive semantics rests on several fundamental notions. First, meaning is not identified with truth conditions, but with 'mental experience' or 'conceptualization' in the broadest sense of that term. ... Second, a linguistic category is typically 'complex': its adequate description requires not just a single structure, but a set of structures linked by relationships of instantiation and extension to form a network. ... Third, linguistic semantics is 'encyclopedic' in scope. The meaning of a lexical item (even a single sense) cannot in general be captured by a limited, dictionary-type definition. *Everything we know about an entity can in principle be regarded as contributing to the meaning of an expression that designates it, even though certain specifications are far more central and linguistically important than others. One cannot motivate any sharp distinction (only one of degree) between semantics and pragmatics, or between 'linguistic' and 'extralinguistic' knowledge.* Finally, an expression's meaning does not consist solely in the conceptual content it evokes (let alone in truth conditions or the objective situation it described)—equally significant is how that content is 'construed.' Two expressions may invoke the same conceptual content yet differ semantically by virtue of the construals they impose. (Langacker 1994:591; italics added)

4.4.2.2.2 The prominence view

The prominence view similarly goes beyond logical reasoning and objectivity, being concerned with the way in which the selection and syntactic positioning of various units are "determined by the different degrees of prominence carried by the elements involved in a situation" (Ungerer and Schmid 1996:xii). Prominence is of course concerned with the positioning of subject as opposed to object, but there are also many other applications. The approach builds upon the notion of figure/ground segregation, which has been developed in work on visual perception by gestalt psychologists. The view is that syntax does not simply define a set of semantically neutral phrase, clause and

sentence patterns, but rather, syntax reflects patterns of conceptual structuring of semantic units represented in the expression.

Langacker writes:

Grammar is claimed to be 'symbolic' in nature. Only symbolic units (form-meaning pairings) are held necessary for the description of grammatical structure. Thus all valid grammatical constructs are attributed some kind of conceptual import. Rather than being autonomous in regard to semantics, grammar reduces to the structuring and symbolization of conceptual content. (Langacker 1994:592)

4.4.2.2.3 The attentional view

The third view, which is similarly concerned with the how the information in a clause is selected and arranged, is the attentional view. This view is "based on the assumption that what we actually express reflects which parts of an event attract our attention" (Ungerer and Schmid 1996:xiii). The attentional view attempts to explain why one stage of an event is expressed in a sentence while other stages are not.

The attentional view builds upon the idea of frames. "A frame is an assemblage of the knowledge we have about a certain situation (e.g., buying and selling). Depending on where we direct our attention, we can select and highlight different aspects of the frame, thus arriving at different linguistic expressions. Although elementary types of frames, for instance the 'motion event-frame', are presumably shared by all human beings, they are expressed in different ways in different languages ..." (Ungerer and Schmid 1996:xiv).

The prominence and attentional views to some extent reflect competing objectives in conceptual structuring, so that both are involved. "Taken together, prominence and attention allocation seem to be no less relevant for syntactic analysis than the rule-based description of logical grammars" (Ungerer and Schmid 1996:xiii).

4.4.2.2.4 Experientialist philosophy

As Lakoff (1987) and Lakoff and Johnson (1980, 1999) discuss, cognitive linguistics is based upon experientialist philosophy. They give considerable attention to the development of experientialist philosophy as opposing objectivist philosophy. For the purposes of this study, the more relevant contrast is that between experientialist linguistics and objectivist linguistics. Concerning objectivist linguistics, Lakoff and Johnson (1980) write:

[In the view of objectivist linguistics] Linguistic expressions are objects that have properties in and of themselves and stand in fixed relationships to one another, independently of any person who speaks them or understands them. As objects, they have parts—they are made up of building blocks Within a language, the parts can stand in various relationships to one another, depending upon their building-block structure and their inherent properties. The study of the building-block structure, the inherent properties of the parts, and the relationship among them has traditionally been called *grammar*.

Objectivist linguistics sees itself as the only *scientific* approach to linguistics. The objects must be capable of being analyzed in and of themselves, independently of contexts or the way people understand them. As in objectivist philosophy, there are both empiricist and rational traditions in linguistics. The empiricist tradition, represented by the latter-day American structuralism of Bloomfield, Harris, and their followers, took texts as the only objects of scientific study. The rationalist tradition, represented by European structuralists such as Jakobson and American figures like Sapir, Whorf, and Chomsky, viewed language as having mental reality, with linguistic expressions as mentally real objects. (Lakoff and Johnson 1980:204-205)

It should be clear that the tradition to which Lakoff and Johnson refer is not simply an objectivist position. It also has considerable overlap with the tradition and constellation of commitments identified in this study as the Saussurean paradigm.

As one might anticipate, the experientialist philosophy Lakoff and Johnson espouse, when applied to the problem of language and communication, is reminiscent of John Locke's experientialist philosophy and his discussion of language and communication (see again sections 3.2.2.2.1 and 3.2.2.2.3). Locke did employ a theory of signs, but he did not consider human understanding or human communication to be a secure and constant affair. Indeed, as Harris and Taylor explain, Locke's conception of

language introduces "serious, explicitly reasoned worries about the capacity of language to serve as an adequate vehicle for the telementational communication of ideas" (1997:137). This study has already demonstrated that the code model is a telementational (i.e., "thought-transferring") view of communication.

In Locke's view, words and ideas (i.e., concepts) were linked, but not securely. Furthermore, the various members in a speech community could employ somewhat different ideas, even though they employed the same words. Accordingly, as Locke saw it, communication could not be objective, but neither was it entirely subjective. In his view as a corpuscularian, primary sensations were accurate representations of reality. In this way, communication was partially grounded in reality, but only partially. The secondary sensations and the various complex constructions built up from them made human understanding and thereby communication less than reliable.

Saussure borrowed the basic form of Locke's model of communication, but in contrast to Locke, his notion of the sign solidified the relationship of concept and sound pattern. Also in contrast to Locke, Saussure proposed that *langue* was not subject to change nor was it variable between individuals in a speech community. Furthermore, it was fixed only by internal values. As a system it was presumed to stand entirely independent of any extralinguistic contexts.

Of course, neither Lakoff, Johnson, nor Langacker share Locke's corpuscularian viewpoint; nevertheless, there are certain elements of that perspective that they do share with Locke. Like both Saussure and Locke, cognitivists maintain a theory of signs, so that meaning and form are related. But in contrast to the Saussurean position, they share with Locke the idea that the relationship of meaning and form is variable, and that it is dependent upon the experience of the individual. Also in contrast to Saussure, they share with Locke the view that language is grounded, if only partially, in experience, and that

the language user can build up complex expressions by making extensions from simpler, basic expressions.

Considering the position taken by these cognitivists, one could almost anticipate what sort of response they might have to the code model of communication. In fact, they do make such a response, although in the absence of an adequate analysis of the code model and its constituents, they direct their attention toward the conduit metaphor, not recognizing that the conduit metaphor is simply a constituent of the code model. Their rejection of the code model is nevertheless clear.³⁶ Lakoff and Johnson write:

Within objectivist linguistics and philosophy, meanings and linguistic expressions are independently existing objects. Such a view gives rise to a theory of communication that fits the CONDUIT metaphor very closely:

Meanings are objects.

Linguistic expressions are objects.

Linguistic expressions have meanings (in them).

In communication, a speaker sends a fixed meaning to a hearer via the linguistic expression associated with that meaning.

On this account it is possible to objectively say what you mean, and communication failures are matters of subjective errors: since the meanings are objectively right there in the words, either you didn't use the right words to say what you meant or you were misunderstood. (Lakoff and Johnson 1980:206)

Later in their discussion, Lakoff and Johnson comment:

When it really counts, meaning is almost never communicated according to the CONDUIT metaphor, that is, where one person transmits a fixed, clear proposition to another by means of expressions in a common language, where both parties have all the relevant common knowledge, assumptions, values, etc. When the chips are down, meaning is negotiated: you slowly figure out what you have in common, what it is safe to talk about, how you can communicate unshared experience or create a shared vision. With enough flexibility in bending your world view and with luck and skill and charity, you may achieve some mutual understanding. (Lakoff and Johnson 1980:231-232)

4.4.2.3 Integrationalists

The terms *integrated* and *integrational linguistics* are developed by Harris (1981, 1990) as contrasting with the "orthodox" linguistics developed under the "language myth"

of the “telementational fallacy” and the “determinacy fallacy.” Harris introduces the language myth as follows:

The language myth is the product of two interconnected fallacies: the telementational fallacy and the determinacy fallacy. The telementational fallacy is a thesis about the function of language, while the determinacy fallacy is a thesis about the mechanism of language....

According to the telementational fallacy, linguistic knowledge is essentially a matter of knowing which words stand for which ideas. For words, according to this view, are symbols devised by man for transferring thoughts from one mind to another. Speech is a form of telementation....

The determinacy fallacy, or ‘fixed code’ fallacy (as it might alternatively be called) provides the explanation of how the telementation process works, and indeed of how telementation is possible. (Harris 1981:9-10)

Harris defines the *telementation theory* as “the theory which explains communication as the transference of thoughts from one person’s mind to another person’s mind” (Harris 1990:26). In referring to the telementation theory and “mythologised” linguistics (see 1981:9-11), Harris is addressing the Saussurean paradigm and code model linguistics. Harris is one of few linguists who have expressed serious reservations concerning the continued development of the discipline of linguistics under the code model perspective.

Harris characterizes *integrational linguistics* as follows:

A demythologised linguistics (or, to give it a less negative designation) an ‘integrational linguistics’ would need to recognise that language allows and requires us to do both far more and far less than the telementational model claims. Language is a process of making communicational sense of verbal behavior. Our training in language is a training to use words in such a way that, in the context of a particular situation, our total behavior will make the kind of sense to others that we intend it should, and effectively implement our interactional objectives. It follows that language cannot be studied in isolation from the investigation of ‘rationality’. It cannot afford to neglect our everyday assumptions concerning the total behavior of a reasonable person. These include assumptions about his probable utilisation of the linguistic resources available to him, but stop well short of assuming that everyone in a language community uses and interprets words in exactly the same way. On the contrary, it is manifest that if individuals actually behave in accordance with the principle of mechanical uniformity conjured up by the language myth, most of their attempts to communicate would be bound to end in failure. (Harris 1981:165)

In his 1990 article, Harris suggests a provocative and ambitious agenda for reformation:

An integrationalist redefinition of linguistics can dispense with at least the following theoretical assumptions: (I) that the linguistic sign is arbitrary; (ii) that the linguistic sign is linear; (iii) that words have meanings; (iv) that grammar has rules; and (v) that there are languages" (1990:45). This last point, despite its paradoxical appearance, follows from the first four. In effect, to dispense with the first four assumptions is, precisely, to say that linguistics does not need to postulate the existence of languages as part of its theoretical apparatus. What is called into question, in other words, is whether the concept of 'a language', as defined by orthodox modern linguistics, corresponds to any determinate or determinable object of analysis at all, whether social or individual, whether institutional or psychological. If there is no such object, it is difficult to evade the conclusion that modern linguistics has been based upon a myth. (Harris 1990:45)

In Harris' view, "Languages are functions of communicational processes, not vice versa" (1990:50). He elaborates, stating:

Integrationalism redefines linguistics as a mode of inquiry into the construction and articulation of our linguistic experience. It inquires not into the hypothetical structure of abstract linguistic systems, nor into their even more hypothetical representations in the human brain, but into the everyday integrational mechanisms by means of which the reality of the linguistic sign as a fact of life is established. (Harris 1990:50)

Harris suggests that integrational linguistics should proceed according to several principles. These are developed extensively in Harris 1981, but only briefly introduced here:

First and foremost, an integrational linguistics must recognize that human beings inhabit a communicational space which is not neatly compartmentalised into language and non-language. The consequences of this 'non-compartmentalisation principle' are basic for the methodology of linguistic studies. It renounces in advance the possibility of setting up systems of forms and meanings which will 'account for' a central core of linguistic behavior irrespective of the situation and communicational purposes involved. But it is important to note that this consequence does not automatically destroy the concept of a language community. What it does rather, is to demand that the concept of a language community be reformulated in more realistic terms than those of the regimented sameness postulated by the language myth.

Nor is there any assumption that the communicational space available to the participants in a given situation is an amorphous area which cannot in principle be mapped out, and its locational features differentiated. What is assumed,

simply, is that no such cartography can be divorced from the communicational purposes involved, and the available channels of contact between participants. If that is equivalent to denying that there is any one identifiable system which is 'the language' in question, so be it.

The alternative to a linguistics which concerns itself exclusively with 'the language' is a linguistics which takes as its point of departure the individual linguistic act in its communicational setting. ... (Harris 1981:165-166)

Harris continues:

Secondly, what is important from an integrational perspective is not so much the fund of past linguistic experience as the individual's adaptive use of it to meet the communicational requirements of the present. That use is—and can only be—manifest in the communication situation itself. No new technology is required to study it. The evidence is available *in praesentia*. All that is lacking is the readiness to accept it.

On the semantic side, this requires willingness to concede the indeterminacy of what is meant, and on a scale which many may feel goes against the grain of the whole educational tradition. In this they would be right. For the educational tradition in question has been based for centuries on the sacrosanctity of the dictionary. The assumption that we communicate by means of internalised dictionaries is a natural continuation of that tradition, transposed into the terms of Saussurean psychologism. ... (Harris 1981:187)

In referring to the "fund of past linguistic experience," Harris is addressing the traditional focus on defining what constitutes particular languages, such as English or German. In his view, an integrational perspective would, instead, explore how it is that people individually use their language skills in meeting daily communicative needs.

In contrast to emergent grammarians and cognitive semanticists and grammarians, Harris provides little discussion of particular methods and techniques which might be employed in integrational linguistics. He does, however, provide discussion of philosophical concerns which are important not only to integrationalists, but to revolutionary linguists in general.

4.5 Viewing revolutionary approaches as developmental

Revolutionary approaches must be recognized as being somewhat autonomous of normal science approaches; they depend on a different conception of language and its

relationship to communication, even though their proponents may not have explicitly outlined the models so employed. In consideration of Kuhn's incommensurability hypothesis, reviewers must make a concerted effort to overcome the biasing effect of a familiar paradigm before offering criticism of a competing paradigmatic perspective. Reviewers may find it difficult to think in the terms defined by a different paradigm. They can begin, however, by considering the research questions defined by the revolutionary approach, comparing those questions to the research questions of the paradigmatic perspective with which they are familiar.

Revolutionary approaches should also be recognized as being developmental. That is, being in the process of development, they may not address all the areas of inquiry covered by approaches with greater longevity. Linguists from other schools are understandably eager to see how this or that new theory will handle their favorite area of interest. Occasionally, however, that eagerness grades into criticism. It is said that such criticism was occasionally directed toward Chomsky's early work in developing generative linguistics. Critics complained that the new grammar was inadequate since it didn't cover every area that previous theories had addressed. Chomsky is said to have responded with something to the effect of "We must assume that those areas will be developed in time" (Donald A. Burquest 1998, personal communication). That same defense may be offered in on behalf of approaches presently considered revolutionary.

CHAPTER V

DEVELOPING AN ALTERNATIVE

5.1 “If you want to end a war ...”

Following publication of an editorial column criticizing a political policy, reader T. J. Tally wrote the editor, noting that while the column offered much criticism, it made no suggestions for improvements. Tally, commented: “If you want to end a war, you have to solve the problems the war solves, without the war. If you want to end a system of taxation, you have to solve the problems it solves, without that system” (1997:4).

Tally’s words can stand as a trenchant response to any critical review, including a review of the code model of communication. In other words, if you want to solve the problem of communication without the code model, then you have to solve the problem the code model solves, without that model.

The task is not simple. One must of course identify the problems which the model does solve, as well as those which are not solved. Since, as Kuhn explains, each paradigm sets for itself the problems it considers important (1996:148-149), it can be difficult to determine exactly what problems *should* be solved.

One must also evaluate the options available for replacement. As Kuhn explains, one can’t abandon a paradigmatic perspective until a satisfactory replacement is available (1996:77-79). Obviously, linguists will respond to available models differently. One may expect that, in the view of some linguists, none of the currently available replacements will be considered satisfactory.

With these concerns in mind, this chapter provides a critique of the code model and several alternative models, then suggests a composite alternative model. The

alternative model so developed is not proposed as the singular replacement for the code model, but as an antithesis—an essential component in the evaluation and evolution of linguistic metatheory.

5.2 A critical evaluation of the code model

This section addresses certain anomalies supported by the code model of communication. The discussion addresses four major concerns: variation, abstraction, meaning, and discourse. Related concerns are subsumed under these major headings. As was briefly reviewed in section 4.4.1, proponents of code model linguistics may suggest various patches which, in their view, help to cover these problem areas. A distinction should be maintained, however, between the core model and the patches proposed for its support, particularly when the patches themselves sometimes violate the basic theory established in that model. Concerning the habit of defending the code model view via patches, Harris writes:

Paradoxically, ... linguistics emerges as a 'science' in which the scientists have to ignore their own theoretical principles in order to be able to practice. Doubtless there are many disciplines in which, for practical purposes, theoretically illegitimate short cuts are taken every day. But there cannot be many which retain their status as sciences if the only way to proceed is for practitioners to flout established theory all the time. (Harris 1990:38)

5.2.1 The problem of variation

As discussed in chapter 3, the code model represents the integration of three constituent models: the model inherent in the conduit metaphor, Saussure's speech circuit model, and Shannon's information theoretic model. Saussure's speech circuit model and Shannon's information theoretic model treat the code as being both fixed and shared by communicators. Correspondingly, both presume that if these conditions are not met, then communication will not be successful. Being the result of this integration, the code model

of communication similarly describes communication as being possible because the transmitter (speaker) and receiver (hearer) share identical copies of the code. *Strictly speaking*, it also presumes that if these conditions are not met, then communication will not even be possible.

For Shannon's model the necessity of the fixed- and shared-code condition is readily apparent. Shannon was describing electronic devices and, as an electrical engineer, was concerned with statistically evaluating the effectiveness of transmission, reception, and reconstruction of messages from received signals. It was essential, therefore, that the devices used in the transmission and reception be designed as a communicative pair. This included the condition that they have identical copies of the code. If an electrical engineer were to connect to one end of a circuit a teletype keypad and to the other end a telephone, that is, instruments which were not designed as a communicative pair and which do not share a code, then understandably, it would be difficult for the engineer to statistically evaluate the success of the transmission.

In considering Saussure's purposes, the necessity of the fixed- and shared-code condition is not so readily apparent. It is, however, a requirement for Saussure's notion of synchronic linguistics. As Koerner writes:

At the core of Saussure's linguistic theory is the assumption that language is a system of interrelated terms which he called 'langue' (in contradistinction to 'parole,' the individual speech act or speaking in general). *This 'langue' is the underlying code which ensures that people can speak and understand each other*; it has social underpinning and is an operative system embedded in the brain of everyone who has learned a given language. The analysis of this system, Saussure maintains, is the true object of linguistics. (Koerner 1994:3663)

Joseph similarly comments:

In Saussure's view, *langue* is a 'treasury' or 'collection of impressions' that is 'deposited' *in identical form in the brain of each member of a given speech community*. He uses the metaphor of a dictionary, of which *every individual possesses an identical copy*. What the individual does with this socially-shared

system falls entirely into the realm of *parole*. (Joseph 1994:3666; italics added; see Saussure 1983:[38])

As discussed in section 3.2.2.2, Saussure borrowed the basic structure of his model of communication from Locke; however, Locke's use of the model differs considerably from Saussure's. While Locke did not use the term "code," it is clear that he considered a fixed and shared language system to be a requirement for accurate communication. Unlike Saussure, however, Locke presumed that the extent to which the system was shared and fixed was so limited that the results of communication via that system were entirely inconsistent. In Locke's view, this was one of the basic weaknesses of human communication and human understanding. This position is abundantly clear in Locke's *Essay on Human Understanding*. Accordingly, it seems implausible that Saussure could have borrowed from Locke the basic form of the speech circuit model of communication without also being aware of Locke's critique of communication via the process described in that model.

Even if Saussure were, in fact, ignorant of Locke's argument, his understanding of historical-comparative linguistics should have kept him from positing a fixed and shared code. He was, after all, a renowned scholar in the historical-comparative tradition. The entire goal of that tradition rested on accounting for sound change and structural change across time and geographic space. The etymological-philological tradition, to which the historical-comparative tradition was closely related and with which Saussure was well acquainted, was similarly concerned with addressing semantic change across time and geographic space.

It is clear that Saussure was not unaware of the nature of variation. The *Cours* documents Saussure's views concerning variation in time and space. Consider, for example, the following:

Synchronic laws are general, but not imperative. It is true that a synchronic law is imposed upon speakers by the constraints of communal usage (cf. [Saussure 1983:107]). But we are not envisaging here an obligation relative to the language users. What we mean is that *in the language* there is nothing which guarantees the maintenance of regularity on any given point. A synchronic law simply expresses an existing order. It registers a state of affairs. What it states is of the same order as a statement to the effect that in a certain orchard the trees are planted in the form of a quincunx. The order a synchronic law defines is precarious, precisely because it is not imperative. Nothing could be more regular than the synchronic law governing stress in Latin This system of stress, none the less, offered no resistance to factors of change, and eventually gave place to a new law, which we find in French In short, when one speaks of a synchronic law, one is speaking of an arrangement, or a principle of regularity. (Saussure 1983:[131])

It is difficult to say what the difference is between a language and a dialect. ...

It is impossible to imagine in any shape or form a precise linguistic boundary dividing an area covered throughout by evenly differentiated dialects. Language boundaries, just like dialect boundaries, get lost in these transitions. Just as dialects are only arbitrary subdivisions of the entire surface covered by a language, so the boundaries held to separate two languages can only be conventional ones. (Saussure 1983:[278-279])

Considering Locke's critique of human communication, Saussure's own background in the historical-comparative tradition, and the fact that the *Cours* does address variation in time and space, one would be remiss in suggesting that Saussure's decision to describe the code as fixed and shared indicates naivete. His decision in this regard was clearly intentional. One must then ask *why* and, more importantly, *how*, did Saussure come to describe the code as being fixed and shared?

The answers to these questions seem to involve three issues: the perspective of historical-comparative linguists (of Saussure's day), the perspective of the language user (as Saussure understood it), and the dominant perspective regarding science at the turn of the century.

Despite Saussure's proficiency in practicing historical-comparative linguistics, in his view, when taken alone, that perspective offered an inadequate account of language, if indeed it was accounting for language at all (see Harris 1983:xi). The *Cours* states:

The first thing which strikes one on studying linguistic facts is that the language user is unaware of their succession in time: he is dealing with a state. Hence the linguist who wishes to understand this state must rule out of consideration everything which brought that state about, and pay no attention to diachrony. Only by suppressing the past can he enter into the state of mind of the language user. The intervention of history can only distort his judgement. (Saussure 1983:[117])

It is clear that the synchronic point of view takes precedence over the diachronic, since for the community of language users that is the one and only reality The same is true for the linguist. If he takes a diachronic point of view, he is no longer examining language, but a series of events which modify it. (Saussure 1983:[128])

As Saussure saw it, one could not be accounting for language without addressing the fact that language users employed it contemporarily in thinking and communicating. The diachronic perspective simply did not attempt to address that fact.

As Saussure notes, *from the perspective of the language user*, the system was fixed and shared. While language does change and vary, from the perspective of the language user in a tightly assembled speech community, that change is imperceptibly slow and variation is seemingly insignificant. The user is “dealing with a state” (Saussure 1983:[117]). In Saussure’s view, the linguist should be able to account for that state. The diachronic view of the historical-comparativist, however, made that impossible.

In developing his opposing argument to the diachronic view, Saussure considered it logically necessary that he fix the state of a language in time. This required, however, that it also be *fixed in space*. This concession was not *in spite of* his understanding of geographic variation, but, rather, *because of* his understanding of the historical-comparative problem.

Saussure understood that the distinction between variation in time and variation in space was only one of perspective and emphasis; there is little substantive difference between geographic variation and historical variation. While they can result from different mechanisms, for all intents and purposes, they involve similar types of sound change,

grammatical change, semantic change, and social conditioning factors (see figure 5.1). Saussure could not reject a view of linguistics which kept historical change in view without simultaneously rejecting a view of linguistics which kept geographic variation in view.

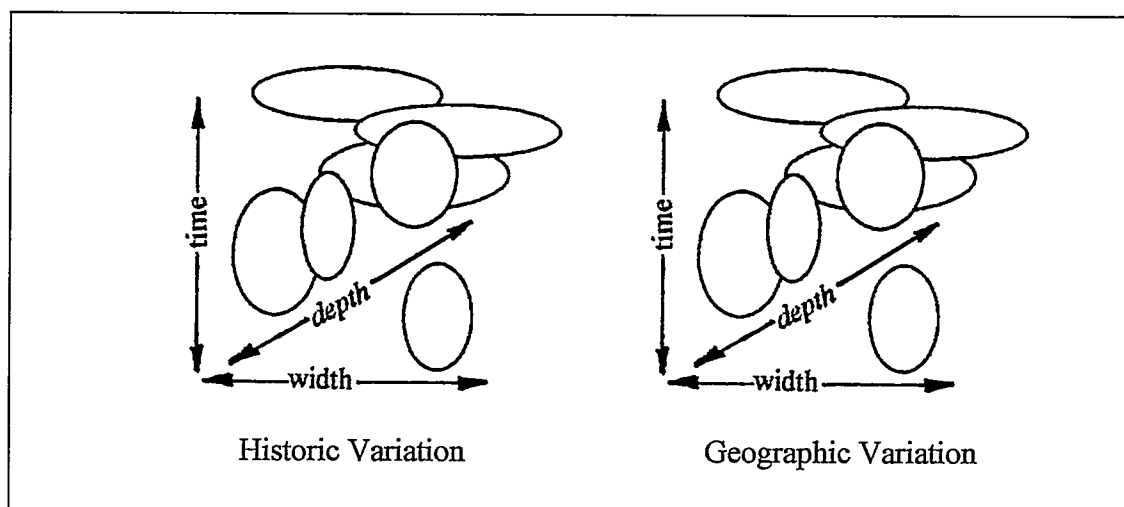


Figure 5.1. Variation as plotted on three dimensions: width, depth, and time. The accounts of historic and geographic variation are distinguished only by perspective and emphasis.

It is important to recognize, however, that, in the *Cours*, Saussure does not explicitly address this logical relationship between historical and geographic variation. Nor does he address the fact that his synchronic approach involved reductionism.¹ Specifically, it required Saussure to negate the significance of geographic variation. Saussure's awareness of the problem is nevertheless apparent in his waffling regarding the notion of dialect and his awkwardness in fixing the state of a language in time:

The object of synchronic study does not comprise everything which is simultaneous, but only the set of facts corresponding to any particular language. In this, it will take into account where necessary a division into dialects and sub-dialects. The term *synchronic*, in fact, is not sufficiently precise. *Idiosynchronic* would be a better term, even though it is somewhat cumbersome. (Saussure 1983:[128])

It is relevant to point out ... that linguistic changes do not correspond to generations of speakers. There is no vertical structure of layers one above the other like drawers in a piece of furniture; people of all ages intermingle and communicate with one another. (Saussure 1983:[106])

The relationship of historical and geographic variation is also apparent in the discussion of "collective inertia," which is set as a constraint guarding language from both historical and geographic change (Saussure 1983:[107-108]). Also consider the following, for example, where Saussure uses a geographic illustration to discuss the implications of the historical problem:

Only by suppressing the past can [the linguist] enter into the state of mind of the language user. The intervention of history can only distort his judgement. It would be absurd to try to draw a panorama of the Alps as seen from a number of peaks in the Jura simultaneously. A panorama must be taken from just one point. The same is true of a language. One cannot describe it or establish its norms of usage except by taking up a position in relation to a given state. When the linguist follows the evolution of the language, he is like the observer moving from one end of the Jura to the other in order to record changes in perspective. (Saussure 1983:[117])

It is possible that Saussure considered the nature of this problem and the inherent tension it creates to be self evident and therefore not worthy of discussion. Considering the careful detail with which he discusses other issues, however, that is not likely. It is also possible that he simply did not wish to draw attention to the reduction, since it threatens the validity of his argument. It is more likely, however, that he simply considered the reduction entirely warranted.

It has already been explained that Saussure wished to account for language as viewed by the language user, wherein language is viewed as a static system. It is also clear that he thought linguistics to have lost ground in excessive interest in historical issues. In the history of linguistics, he states:

Since its beginnings, it would be true to say that modern linguistics has been entirely taken up with diachronic study. ...

But what was the method followed by those who studied languages before the foundation of linguistics? How did the traditional 'grammarians' proceed? It

is a curious fact that on this particular point they were concerned with the description of linguistic states. Their program was a strictly synchronic one. ...

Traditional grammar has been criticised for not being scientific. None the less, its basis is less objectionable and *its object of study better defined* than is the case for the kind of linguistics inaugurated by Bopp. The latter attempts to cover an inadequately defined area, never knowing exactly where it is going. It has a foot in each camp, having failed to distinguish clearly between states and sequences.

Having paid too much attention to history, linguistics will go back now to the static viewpoint of traditional grammar, but in a new spirit and with different methods. (Saussure 1983:[118-119]; italics added).

Here Saussure compares the work of traditional grammarians with that of Franz Bopp (1791-1867), the German philologist attributed with coining the term *Indo-European*. Bopp's *Conjugationssystem*, published in 1816, is usually regarded as the beginning of historical-comparative Indo-European linguistics (Koerner 1994:3663). Note in particular how Saussure nostalgically refers to the focus of traditional grammarians, which, in his view, had a well defined object of study. Saussure contrasts this with the historical-comparative tradition, which he saw as attempting to cover an inadequately defined area, never knowing exactly where it was going, and failing to distinguish between states and sequences.

Saussure's dissatisfaction with the historical-comparative paradigm of linguistics was coupled with concern that the study of language would be subsumed under the auspices of Wundtian psychology. As Joseph describes it, Wundt's approach was fashionable, for it seemed scientific in that it "eliminated the metaphysical abstraction of 'language,'" however, it replaced that metaphysical abstraction "with still less satisfactory explanations that revolved around 'the spirit of peoples,' were untestable, and could not sustain any approach to language that was detailed or systematic" (Joseph 1994:3665).

Saussure's response was to reinstate an objectivist view of language which followed "the static viewpoint of traditional grammar, but in a new spirit and with different methods" (see again Saussure 1983:[118-119]). Objectivism was not new to

linguistics. The historical-comparative tradition had employed its own version of objectivism, treating language as an *evolving* object. Saussure created a synchronic approach to linguistics by proposing the study of language as a *static* object. But what to do with the tension created by the *fact* of geographic variation?

Saussure handled this dilemma by dissecting *langage* (language as a total phenomenon) into *parole* (actual speech production) and *langue* (the socially shared system of signs that makes production and comprehension possible) (Joseph 1994:3665). In this way the *langue* could be regarded as a fixed and shared system, and the problems of communication could be relegated to *parole*. In this reductive strategy, *langue* was identified as the object of study for synchronic linguistics. Saussure writes:

A language system, as distinct from speech, is an object that may be studied independently. Dead languages are no longer spoken, but we can perfectly well acquaint ourselves with their linguistic structure. A science which studies linguistic structure is not only able to dispense with other elements of language, but is possible only if those other elements are kept separate.

While language in general is heterogeneous, a language system is homogenous in nature. It is a system of signs in which the one essential is the union of sense and sound pattern, both parts of the sign being psychological. (Saussure 1983:[31-32])

Even for readers unfamiliar with the *Cours*, this pattern of reductionism should look familiar, for it has its logical parallel in contemporary linguistics. This study has already addressed the manner in which Chomsky (1965) and Chomsky and Halle (1968) reduced the elaborated form of the code model into an abridged form, thereby establishing competence and the ideal speaker/hearer in the homogenous speech community as the object of inquiry for generative linguistics (see Harris 1990:30, 36).

Clearly, then, Saussure's answer to the problem of variation involved reductionism. This reduction was a logical requirement for Saussure's establishment of synchronic linguistics. This was not considered problematic at the time, however, for it had as a theoretical reward the identification of an object of study for linguistics. In

reducing the reality of the language community and reifying the language system, Saussure produced the object, *langue*. For the science of his day, this was considered an entirely warranted approach. It has remained the norm for linguists throughout the Saussurean paradigm. As Joseph notes, "... *langue* (naturally somewhat evolved from Saussure's original conception of it) continues to be the object of study of virtually every approach to which the name 'linguistics' is accorded" (1994:3665).

The point to be made in this section of the present study is that Saussure's reductionism regarding linguistic variation creates an anomaly for which code model linguistics (and the Saussurean paradigm generally) cannot account. That is, the code model account of communication is incompatible with the reality of variation in human speech communities.

If Saussure's speech circuit model were not integrated with Shannon's information theoretic model, this fact might be more readily recognized. But since the two have been integrated, the anomaly is masked. As discussed, in legitimate applications of Shannon's information theoretic model the fixed- and shared-code condition is in fact a justified and essential requirement. Most linguists, having at best a limited grasp of Shannon's theory, borrow from it an unwarranted sense of confidence in the code model. They do not recognize how different Shannon's notion of the code is from the notion of code developed in Saussure's *langue*.

The gravity of this anomaly is clear in the following quotation from Wardhaugh, wherein Wardhaugh accepts the reconstrual of *langue/parole* in its current form of competence/performance. (The quotation also appears in section 4.4.1.3.2.)

The competence-performance distinction just mentioned is one that holds intriguing possibilities for work in linguistics, but is one that has also proved to be most troublesome, particularly when much of the variety that is so interesting within language is labeled 'performance' and then brushed to one side by those who consider 'competence' to be the only valid concern of linguists. The language we use in everyday living is remarkably varied. In fact,

to many investigators it appears that it is that very variety which throws up serious obstacles to all attempts to demonstrate that each language is at its core, as it were, a homogeneous entity, and that it is possible to write a complete grammar for a language which makes use of *categorical rules*, i.e., rules which specify exactly what is—and therefore what is not—possible in the language. Everywhere we turn we seem to find at least a new wrinkle or a small inconsistency with regard to any rule one wishes to propose; on too many occasions it is not just a wrinkle or inconsistency but actually a glaring counter-example. When we look closely at any language, we will discover time and time again that there is considerable internal variation, and that speakers make constant use of the many different possibilities offered to them. No one speaks the same way all the time, and people constantly exploit the nuances of the language they speak for a wide variety of purposes. The consequence is a kind of paradox; while many linguists would like to view any language as a homogeneous entity and each speaker of that language as controlling only a single style, so that they can make the strongest possible generalizations, in actual fact that language will be seen to exhibit considerable internal variation, and single-style speakers will not be found (or, if found, will appear to be extremely ‘abnormal’ in that respect, if in no other!). (Wardhaugh 1986:5)

5.2.1.1 The problem of defining ‘language’

Related to the problem of variation is the problem of defining the term language (and by extension the terms dialect and sub-dialect). In focus here is the sense of the term which Crystal defines as follows: “In such phrases as ‘first language’, ‘the English language’, the sense is the abstract system underlying the collective totality of the speech/writing behavior of a community (the notion of *langue*), or the knowledge of this system by an individual (the notion of competence)” (1997:214). The point is that if the linguist accepts the reality of variation, then this sense of the term language can only be arbitrarily (or conventionally) applied. It cannot, however, signify anything of theoretical consequence.

Eagleton comments on this problem in relation to the false dichotomization of *literary* versus *ordinary* language:

The Formalists, then, saw literary language as a set of deviations from a norm, a kind of linguistic violence: a literature is a ‘special’ kind of language, in contrast to the ‘ordinary’ language we commonly use. But to spot a deviation implies being able to identify the norm from which it swerves. Though ‘ordinary language’ is a concept beloved of some Oxford philosophers, the

ordinary language of Oxford philosophers has little in common with the ordinary language of Glaswegian dockers. The language both social groups use to write love letters usually differs from the way they talk to the local vicar. The idea that there is a single 'normal' language, a common currency shared equally by all members of society, is an illusion. Any actual language consists of a highly complex range of discourses, differentiated according to class, region, gender, status and so on, which can by no means be neatly unified into a single homogeneous linguistic community. (Eagleton 1983:4-5)

As ironic as it may seem, language, the object of study for the Saussurean paradigm of linguistics, cannot be defined in the terms of that paradigm. Simpson explains:

Language is not definable in linguistic theory. No firm boundary can necessarily be drawn between one language and another and one language may contain vast differences of pronunciation, grammar, and vocabulary. 'A language' was glossed as being a 'mode of speaking or writing common to a group of people.' In spite of the difficulties just mentioned, it could be imagined that all speakers of a language can understand each other and that a postulated mutual intelligibility could be used as the distinguishing mark of a language. But mutual intelligibility is not definable either and therefore cannot be used as the criterion for a language. ...

It will be obvious that the impossibility of defining 'a language' as a technical term in linguistic theory does not prevent the widespread use of the phrase, especially in popular speaking or writing. (Simpson 1994:1896)

Simpson is not suggesting here that "language" is a useless term or concept. Rather, she simply points out that the idea of language as a fixed and shared, disembodied object cannot be supported by the data available from study of natural language. Clearly, both linguists and speakers identify "languages," that is, English, German, Swahili, and so forth; however, the objects to which they refer are better understood as conceptual prototypes held by individuals. These prototypes are based upon accumulated experience with the behavior of others, who employ similar, although never identical prototypes.

Simpson does note that generativists have developed a definition of the term *language*:

A particular use of the phrase 'a language' is that of transformational-generative grammar where a language is held to be an infinite set of sentences, each sentence being finite in length and constructed out of a finite set of elements. This view ... is thus able, it is claimed, to give a precise definition of

a language; for a language is seen to be the output of the grammar that can construct the set of sentences constituting the language: consequently, a given language can be defined as that which a given grammar produces. (Simpson 1994:1896-1897)

The problem here, however, is that the generative definition of language is, to paraphrase, “the output of the code.” In other words, the definition is circular; it does not answer the question.

Simpson concludes by stating:

It will be obvious that the impossibility of defining ‘a language’ as a technical term in linguistic theory does not prevent the widespread use of the phrase, especially in popular speaking or writing. But within linguistics, and especially in sociolinguistic investigation, the term tends to be avoided and the neutral description ‘variety’ or ‘variety of language’ is used instead. (Simpson 1994:1896)

Of course, the replacement of the term language with the term *variety* or the phrase *variety of language* simply points right back to the original problem. Sociolinguists are correct in noting that variety is the reality, but as Wardhaugh demonstrates in the quotation above (1986:5), this reality is in conflict with their code model-based theories and notion of communication. As Harris states: “The word language is a layman’s word. It is a word formed, as Bacon puts it, ‘at the will of the generality’. Anyone who takes it as mapping out a certain field of inquiry, or at least as providing a starting point, would do well to ask himself what exactly that commits him to” (Harris 1981:3).

5.2.1.2 The problem of categorization

As one might anticipate, the problem of categorization is also closely related to the problem of variation. Linguists working on grammars or phonologies rarely struggle with this issue. Since they are generally working with data from an individual or a small group of individuals, those individuals provide them with a conventional name by which they may refer to the idiolects surveyed.

As one would expect, however, the issue of categorization does present a problem for contemporary historical-comparativists working on language geneologies. Just as the Swedish naturalist Linnaeus (1707-1778) was faced with the issue of determining what should constitute a species, the code model linguist is faced with the issue of determining what should constitute a language, dialect, and so forth. In Linnaeus' case, and in the case of code model linguistics, the result is species essentialism.

[Species essentialism] is the concept that all members of a species share a common natural state that serves to define and separate them from other species, with observed variations in individuals of a species being caused by forces that interfere with the organism's attainment of its natural state. This pre-evolution perspective holds that species are fixed entities, a view no longer accepted by biologists. (Bothamley 1993:497)

Understandably, some historical-comparativists may bristle at this assertion. Even so, the critique should be taken seriously. Species essentialism is an unavoidable logical extension of a code model account of language. As should be clear at this point in the discussion, the fallacy of species essentialism is a core issue inherent in Saussure's dichotomization of diachronic and synchronic approaches.

Categorization also presents a problem for sociolinguists. As Simpson notes, sociolinguists, more so than the practitioners of most subdisciplines of linguistics, seem to be aware of the problem of defining language—thus their preference for the term variety. Nevertheless, the code model perspective of language is woven into the metatheory of sociolinguistics. Even though sociolinguists may abandon the term language in an effort to circumnavigate the reductionism inherent in Saussure's development of synchronic linguistics, the code model and Aristotelian logic continually bring the core issue to the forefront.² The logic states:

If people share a speech community, then they communicate.
 If they communicate, then they must share a code.
 Therefore, if people share a speech community, they must share a code.

The problem in defining a code is, of course, directly related to the problem of defining a language. Thereby Wales states: "Code,' as a term borrowed from communication theory and semiotics, is so widely used in other fields, linguistic and literary, that it is in danger of becoming a mere synonym for language, variety, or dialect" (Wales 1994:577).

Cherry's (1966) discussion of quantization brings the issue to the only reasonable conclusion, albeit one which presents an impasse for the Saussurean notion of *langue* and, if taken seriously, the enterprise of synchronic linguistics:

The words "quantum" and "quantization" have become adopted with specialized significance by physicists, but are used in the present context with their original meaning of "allowed amount," "sufficient quantity," or more precisely "significant change of quantity." The concept is really very broad; quantization is a logical necessity of description. For example, we quantize people [into language groups,] into political parties, into age groups, social classes and the like, though in truth [their language varieties,] their opinions, their ages, and their fortunes are as varied as the winds. We merely do this for the *purpose of discussion*, that is, for communication. (Cherry 1966:47)

Most linguists will agree that individual varieties (idiolects) are grouped via quantization for the purpose of discussion. One may conjecture, however, that many are unaware of how the fact of quantization conflicts with their own code model-based metatheory regarding the nature of language and communication.

5.2.1.3 Revolutionary response to the problem of variation

It should be apparent at this point in the discussion that revolutionary linguists reject certain perspectives and conditions of the Saussurean paradigm. This section provides a general response to the problem of variation. (The section does not, however, repeat discussion of *specific* revolutionary views. For such discussion, see again section 4.4.2.)

Saussure insisted that descriptive linguistics should address language from the perspective of the language user. In the context of his argument countering the historical-comparative paradigm, this was an understandable position. In the contemporary context, however, revolutionary linguistics does not consider this to be a valid position, for it depends upon flawed logic.

Revolutionary linguists recognize the perspective of the language user to be a normal expression of *egocentrism* and *naïve realism*. That is, the typical language user views his neighbors' language use primarily in relation to himself and he assumes that in their language use everyone else means the same thing that he does.³ While such a perspective may be common, it is not based upon reality. Revolutionary linguists may concede that language users' perspectives could provide an interesting topic of study, but they consider the hypothetical language user's perspective to be an inappropriate basis for the scientific study of language as a phenomenon. In their view, such a view supports a flawed notion of constancy and relationship within the speech community.

Saussure described diachronic and synchronic linguistics as being in obvious and essential opposition. Considering the fact that the diachronic view to which he referred was consumed with the definition of historical relationships and the reconstruction of proto-languages, to the relative neglect of then-contemporary language use, one can understand the intensity of Saussure's interest in describing a different view, one which allowed the linguist to look at language as it is used. From perspective of revolutionary linguistics, however, the dichotomization of diachronic and synchronic approaches represents a *false dilemma*.⁴ It is *not* necessary that the linguist studying contemporary language use consider language as being fixed in time and space. In the revolutionary view, any theory of language which treats language as being fixed in time and space simply does not account for the reality of the situation. In the revolutionary view, a theory

of language and communication must be able to account for the fact that language develops and is used in a context of *constant* variation, both in terms of structural usage and in meaning. Any theory which does not account for such is simply not accounting for the reality of human language.

Obviously, then, revolutionary linguists reject the reductionism Saussure employed in developing synchronic linguistics. In the revolutionary view, that reduction is not only considered unnecessary, it is regarded as a *theoretical fallacy*. Accordingly, synchronic linguistics as developed in the Saussurean paradigm is considered a *logically invalid* approach to the problem of language and communication.

5.2.2 The problem of abstraction

The second major area in which the code model account proves anomalous is the problem of abstraction. It is important to see that the problem is not with abstraction, *per se*. All modeling and theory formation involves abstraction. Rather, the problem results from the *type* of abstraction employed. That abstraction involves the disembodiment of language and, subsequently, the reification of the disembodied system in order to create the object, *langue*.

As discussed in regard to the problem of variation, the generation in which Saussure worked did not consider the reduction and abstraction he employed to be problematic. Rather, it seems they accepted these as logical steps in affecting a 'scientific' approach. As Joseph explains, abstraction and disembodiment were part of the 'scientific' spirit of the later nineteenth century (Joseph 1994:3666). If one identifies Saussure's career as beginning in 1879, with publication of his treatise on early Proto-Indo-European laryngeals, and ending in 1913, with his death (the *Cours* was published posthumously in 1916), then it is apparent that his career spans the era to which Joseph refers.

Considering this academic context, it comes as no surprise that Saussure envisioned *langue* as an abstract and disembodied object. Culler writes:

La langue, Saussure argued, must be the linguist's primary concern. What one is trying to do in analyzing a language is not to describe speech acts but to determine the units and rules of combination which make up the linguistic system. *La langue*, or the linguistic system, is a coherent, analyzable object; "[it is a system of signs in which the one essential is the union of sense and sound pattern]" [(Saussure 1983:32)] (Culler 1986:41)

The problem here is not abstraction *per se*. The problem is, rather: (1) the fact that *langue* is not regarded as an abstraction, but as a reality, and (2) the fact that *langue* involves abstraction via disembodiment.

As Karin Stephen explains, abstraction is a kind of metaphor. The reification of the abstraction occurs when the analyst forgets this fact. (Stephen is here building upon the work of Henri Bergson, to whom she refers.) By "abstraction" Stephen is addressing what, in contemporary terms, is commonly identified as prototype. Through reification, the prototype becomes a stereotype. She writes:

Those who have criticised the use of metaphor have for the most part not realized how little removed such description is from the ordinary intellectual method of analysis. They have supposed that in analysis we stick to fact itself, whereas in using metaphor we substitute for the fact to be described some quite different fact which is only connected with it by a more or less remote analogy. If Bergson's view of the intellectual method is right, *when we describe in abstract terms we are not sticking to the facts at all, we are substituting something else for them just as much as if we were using an out and out metaphor*. Qualities and all abstract general notions are, indeed, nothing but marks of analogies between a given fact and all the other facts belonging to the same class: they may mark rather closer analogies than those brought out by an ordinary metaphor, but on the other hand in a frank metaphor we at least stick to the concrete, we substitute fact for fact and we are in no danger of *confusing the fact introduced with the actual fact to which the metaphor applies*. (Stephen in Burke 1954:95; italics added)⁵

The point to be made here is that the linguistic tradition has too easily confused its abstraction for the linguistic facts of real-life language. Disembodiment of the language system, coupled with the abstraction and reification of the system posits the *langue* as

being isolated from *parole*, creating an anomaly for which the Saussurean paradigm cannot account. The problem is masked by the hypothetical assertion, addressed in the previous section, that speech communities might be homogenous and that members of the community may share identical copies of the *langue* code. But once one recognizes that the speech community is not homogenous, not in space nor in time, then both the linguist and the language learner are cut off from access to *langue*. All the linguist and language learner have access to is *parole*.

One might suggest that the linguist would have access to his own *langue*. As discussed in section 4.4.1.1.2, this logical maneuver was an objective of the code model abridgement exercised by Chomsky (1965) and Chomsky and Halle (1968). The fact is, however, that with *langue* and *parole* isolated, the linguist can do no more than listen to himself talk, that is, listen to his own *parole*. Furthermore, if one recognizes that the *langue* is not fixed in time, then one must concede that, even if one could get at the *langue*, one could not get it to hold still long enough to be described. Concerning this problem, Harris writes: "The impossibility is on par with that of describing the rules of various unknown games if the observer cannot be sure which game is being played on any given occasion" (1990:36).

To some this may seem like nonsense; however, the problem in testing hypotheses regarding *langue* (and specifically *grammar*) serve to demonstrate that it is, indeed, a real conflict. Various tests of grammaticality are in the final analysis the only means by which linguist can evaluate hypotheses concerning *langue*. This is as true of "data" gathered from one's own intuition as it is of data gathered from a speech community.

Luka (1998) suggests that regardless of data source, notions of grammatically depend upon intuition and involve "linguistic relativity." "This 'relativity' does not present a problem for stimuli which are recognized as 'extremely good' or 'extremely bad'

on the continuum of acceptability, but the relativistic nature of the stimuli becomes salient when considering ‘possibly-good’ example sentences” (Luka 1998:1). In a psycholinguistic test of linguistic colleagues, Luke determined that responses to “possibly-good” sentences published in articles on syntactic theory depended significantly on affinity for the author of the article and the presence or non-presence of rating symbols (i.e., the ungrammatical asterisk). That is, in comparison to one another, Luka’s sample of linguists could not determine with statistical confidence what constituted grammaticality. (Also see Clark 1973, Greenbaum 1976, Schütze 1996.)

In the terms employed in the present study, Luka’s results suggests that linguists do not have access to *langue*, and with *parole* constantly changing, they cannot consistently hypothesize the nature of *langue*. This is not negating the effect of false starts, speech impediment, and so forth, effects that occur in actual speech. It is, however, suggesting that if *parole* (or performance) is supposed to be the output of a fixed *langue* (competence in regard to grammar), then one would expect that the linguist (and language user generally) should be able to consistently evaluate as either right or wrong the grammaticality of any particular expression. Luka’s findings suggest that they cannot. In other words, it is impossible for the linguist to reject his null hypothesis.⁶ If this is not possible, then one should suspect that the abstraction reflects the *analysis*, rather than the reality.

Obviously, a certain degree of hyperbole is employed here. The point is to require a rigorous account of the theory underlying the notion of *langue* and *parole*. With the *a priori* isolation of *langue* and *parole*, strictly speaking, the linguist has no access to *langue*.

As mentioned, a similar problem exists for the language learner. Some may suggest that universal grammar and the language acquisition device somehow get around

this problem. In that view, the child starts with a version of the code in place, simply having to toggle various switches on or off, thereby setting the parameters of the local speech community's code. Again, how is the child to successfully complete the parameter-setting process when he constantly receives conflicting signals, hearing around him an infinite variety of speech patterns (*parole*). Remember that in a strict reading of the code model account of communication, close enough is not good enough. If the speaker and hearer do not share identical copies of the code, then communication cannot be successful. In a strict reading of the theory, one would have to say that if the codes are not *identical*, then communication is not even possible. Again, it is not the intention of this author to be facetious. Hyperbole simply helps to make the point.

It seems that Saussure himself was aware of the inherent tension in his characterization of *langue* and *parole*, but nevertheless he considered the isolation of *langue* a theoretical necessity. Consider the following, wherein he refers to language and speech, subsequently distinguished as *langue* and *parole*:

The study of language thus comprises two parts. The essential part takes for its object the language itself, which is social in its essence and independent of the individual. This is a purely psychological study. The subsidiary part takes as its object the study the individual part of language, which means speech, including phonation. This is a psycho-physical study.

These two objects of study are doubtless closely linked and each presupposes the other. A language is necessary in order that speech should be intelligible and produce all its effects. But speech also is necessary in order that a language may be established. Historically, speech always takes precedence. How would we ever come to associate an idea with a verbal sound pattern, if we did not first of all grasp this association in an act of speech? Furthermore, it is by listening to others that we learn our native language. A language accumulates in our brain only as the result of countless experiences. Finally, it is speech which causes a language to evolve. The impressions received from listening to others modify our own linguistic habits. Thus there is an interdependence between the language itself and speech. The former is at the same time the instrument and the product of the latter. *But none of this compromises the absolute nature of the distinction between the two.* (Saussure 1983:[37-38]; italics added)

Access to *langue* is not the only area presenting an anomaly. The fact that Saussure characterizes *langue* as being composed only of signs and relations creates an anomaly. Saussure states: "The linguist must take the study of linguistic structure as his primary concern, and relate all other manifestations of language to it" (Saussure 1983:[25]). But what of systematic areas which do not fit into characterization of *langue*? Joseph comments: "It has been suggested that certain work in stylistics ... and in discourse pragmatics constitutes an attempt at a linguistics of *parole*, but it is not yet clear how any aspect of language, once it is systematized, fails to enter the sphere of *langue*" (Joseph 1994:3665). As Joseph infers, sociolinguists and pragmatists, in particular, have struggled with this anomaly. Hymes, for example, has proposed the notion of communicative competence, which is, ironically, "a *langue* of *parole*" (see Hymes 1972).⁷ Grice's maxims similarly constitute "a *langue* of pragmatics" (see Grice 1975).

Divergent perspectives regarding *langue* and *parole* have occasionally entered debates between formalists and functionalists. While formalists and functionalists may typically hold differing views regarding the significance of *langue* and *parole*, it is important to recognize that most, nevertheless, retain the notion of both. With that fact in mind, it is important to understand that the problem of abstraction is not merely a matter of conflict between formalists and functionalists. As section 4.4.1.4 demonstrates in relation to Givón's functional-typological approach, the Saussurean paradigm and code model linguistics are not the domain of formalists alone. The distinction between formalism and functionalism is not the issue here. Many functionalists work with the concept of *langue*, just as do many formalists. Functionalists simply differ with formalists regarding whether "structure determines function" or "function determines structure." Both approaches can function within code model linguistics, for they involve similar

abstractions, only being differentiated by dimensional perspectives. Referring a work by J.

M. Woodger, Burke writes:⁸

Structure, [Woodger] says, is the word which applies to an organ when considered from a three-dimensional set of coördinates, the three dimensions of space. Function applies to the same organ considered from a four-dimensional set, the three spatial coördinates plus the time coördinate. One naturally makes different observations in accordance with the number of coördinates he selects to make them by—but this shift in the basis of his abstracting involves no legitimate material for a quarrel as to whether “structure determines function” or “function determines structure.” The man who settles the issue in favor of structure or function will have massively solved a pseudo-problem resulting purely from the fact that one can assemble and classify data from many points of view. (Burke 1954:94)

Properly understood, the problem of abstraction is a separate issue from that addressed in the typical functional/formal debate. That issue is better described as a matter of philosophical perspective.

As mentioned in section 4.4.2.2.4, Lakoff and Johnson address the abstract disembodied notion of language employed in linguistics. Labeling the general approach *objectivist linguistics*, they write:

According to the myth of objectivism, objects have properties in and of themselves and they stand in relationships to one another independently of any being who understands them. When words are written down they can be readily looked upon as objects. This has been the premise of objectivist linguistics from its origins in antiquity to the present: Linguistic expressions are objects that have properties in and of themselves and stand in fixed relationships to one another, independently of any person who speaks them or understands them. (Lakoff and Johnson 1980:204)

The philosopher of language V. N. Voloshinov has more specifically addressed the approach, calling it *abstract objectivism*. Berge explains:

The abstract objectivist view can, in the light of the history of modern linguistics, be considered the traditional way of seeing things. The prototypical abstract objectivist sees language as a relatively stable, finite, and invariant system of signification, that is either as a unifunctional, adult-type system which is the goal of socialization, or as a social institution (Saussure’s ‘langue’), or as a universal innate mental grammar (Chomsky’s ‘competence’), or even as a pure form (Hjelmslev’s ‘schema’). The relation between signification system and utterances is seen as an either-or opposition: either one

studies language systematically (i.e., as a signification system), or one doesn't study it at all. In this view, language is then something which precedes communication. (Berge 1994:616)

5.2.2.1 Revolutionary response to the problem of abstraction

One would be remiss to suggest that revolutionary linguists don't employ abstraction. Obviously they do. But as stated previously, abstraction, *per se*, is not the issue. Rather, from the perspective of revolutionary linguists, the issue is the tendency to hypostatize language.⁹ This involves the abstract disembodiment of the language system, the reification of that abstraction as some version of *langue*, and finally, the isolation of *langue* and *parole*.

It would be somewhat inaccurate to describe revolutionary linguists as rejecting the isolation of *langue* and *parole*. It is better to describe their position as involving an *integrated* notion of language, so that the concerns previously dichotomized in characterization of *langue* and *parole* are considered inherently inseparable.

This is not to suggest that revolutionary linguists abandon the notion of language as involving a system. But in their view, that system is not disembodied; it cannot be disembodied. Accordingly, they consider the system to inherently involve (and handle) change and variation. They consider the system to be grounded in language use, rather than being isolated from that use. To that extent, their interest is in the system of *human language*, which they consider to inherently involve communication.

In terms of philosophical perspective, the field is a bit divided. As discussed in section 4.4.2.2.4, Lakoff and Johnson, in their development of cognitive semantics, intend to counteract objectivist linguistics with experientialist linguistics. It should be noted, however, that Lakoff and Johnson are intently interested in questions of epistemology. Accordingly, they are concerned with the epistemological issues surrounding objectivism,

perhaps more so than they are with issues more typically addressed by linguists. This concern is strongly reflected in their development of experientialism.

Hopper, with emergent grammar, and Langacker, with cognitive grammar, seem much less concerned with the classic problems of the philosopher. Both of these linguists seem to have rejected abstract objectivism in favor of versions of process philosophy. Bothamley concisely defines process philosophy as follows:

[The term process philosophy refers to] any of a variety of theories emphasizing that the basic reality in the universe is not objects or substances but processes. Objects are mere temporary bodies in the general flux, and are not sharply separated from one another; and real time is continuous and not an accretion of instantaneous moments. Process philosophy can be seen in Heraclitus of Ephesus (writing c.500 BC), and its leading modern exponents include William James (1842-1910), Henri Bergson (1859-1941) and Alfred North Whitehead (1861-1947). (Bothamley 1993:432; see James 1909)

It has been suggested that a similar perspective has been evident in the interests of pidgin and creole specialists (eg. Bickerton 1981), the focus being on the emergence of contact languages in the context of language variety, rather than upon defining the *langue* of the respective speech communities (Kenneth A. McElhanon 1999, personal communication.).

Finally, Berge notes that “skeptics” of the abstract objectivist position tend to share a common perspective. He writes:

Common to the skepticist view is the radical critique of the abstract objectivist opposition between the system of signification and the utterances derived from the system.

The skepticists challenge this opposition in three different and not necessarily compatible ways. In all three, communication plays a more important role in research and reflection on language than in the abstract objectivist tradition. (Berge 1994:616)

Berge describes the three ways in which skeptics oppose abstract objectivism as:

(1) language as communicative behavior, (2) communication as determining language, and (3) communication and language as complementary phenomena (1994:616-618).

5.2.3 The problem of meaning

The third major area in which the code model account proves anomalous is the problem of meaning. The problem of meaning is related to the problems of variation and abstraction discussed above.

As has been explained, in Locke's view, human communication was tenuous since there was no guarantee that two communicators would mean the same thing in their use of words, even though they share a speech community. Nor, in Locke's view, was there any guarantee that an individual would mean the same thing from day to day, even though he may be using the same words both times. The fact that the code model cannot account for this semantic variation is, of course, the problem of meaning.¹⁰

One would be remiss to suggest that Saussure was unaware of this problem. The history of philosophy certainly provided him with ample resources for its investigation. The basic issues of the debate are documented even in the works of Plato (see *Cratylus*). Following in the steps of his master, Aristotle would later write: "Words must be taken to have one clear meaning" (The *Metaphysics*, Book IV). Note, however, that Aristotle's statement betrays its vulnerability as a logical premise. He cannot say, "Words *have* one clear meaning," but rather, that they "*must be taken*" (that is, logically assumed) to have one clear meaning.

Following Aristotle's logic, scientists considering the problem of meaning have been forced to choose between two views: objectivism and subjectivism. Failing to identify this contrast as a false dilemma, many scientists have felt they had no recourse but to choose objectivism (see Bothamley 1993:381-382). The same may be said of Saussure.

Having determined that synchronic linguistics must presume a fixed and shared notion of *langue*, it was a logical necessity that the connection between meaning and structure in the *langue* must also be fixed. Saussure correctly understood that it would

have been logically inconsistent to describe *langue* as having a *fixed system of values*, and then suggest that the individual had to *negotiate* the meaning of every exchange. In contrast to Locke, Saussure was constrained to define meaning and form as inherently linked. In the system of values Saussure describes, if the integrity of even a single sign was negotiated, the whole system would shift in response.

Understanding the tension so created, it is little wonder that Saussure directs the linguist's attention to structure alone. Concerning Saussure's focus on structure and neglect of semantics, Jonathan Culler writes:

Saussure urges the necessity of distinguishing the synchronic and diachronic perspectives in all cases, but his discussion treats only sound changes. Of course, the examples he discusses do have morphological and grammatical consequences within the system, and such readjustments may eventually have semantic consequences, but he never deals with the problem of semantic change itself, the diachronic alternations of signifieds. *He admits, in passing, that once one leaves the plane of sound it becomes more difficult to maintain the absolute distinction between the synchronic and the diachronic* ([Saussure 1983:194]); but the theory certainly enjoins one to do so, and one can make out a plausible though unfashionable case for the extension of the distinction to semantics. (Culler 1986:55; italics added)

As applied to *human* communication, the assumption that a particular structural assemblage of words will inherently mean a particular thing is, of course, related to *both* the conduit metaphor perspective regarding the role of words as containers of meaning and Saussure's view that words are inherently linked to concepts. *Structural determinism* is a natural extension of that view. Determinism is "a theory or doctrine that acts of the will, occurrences in nature, or social or psychological phenomena are causally determined by preceding events or natural laws" (Mish 1983:346). Structural determinism in linguistics is, then, the theory or doctrine that meaning is causally determined by preceding structure. To suggest a statistical metaphor, structure is the independent variable and meaning the dependent variable.¹¹ This assumption constitutes a major component of linguistic structuralism (see Saussure 1983:[25], Harris 1981:10).

While the structural determinist view may appeal to conduit metaphor-based common sense, it creates an anomaly for which code model linguistics (and the Saussurean paradigm generally) cannot account. That is, the meaning does vary in regard to form. It varies over time and it varies across space. Furthermore, meaning varies even in the usage of the individual. Having rejected this fact, the code model account has no way of accounting for semantic change. This weakness refers to the speech community as a whole as well as to the individual language user. The code model can only explain semantics in terms of a building block approach, whereby various words are logically assembled as building blocks, rendering a particular message which corresponds to the generated structure. It cannot account for what may be called the “metamorphosis” of meaning in any way whatsoever.

A model of language and communication which cannot account for this fact is an inadequate model. While Saussure may have considered a notion of fixed meaning to be a requirement of an objectivist view of language and a logical condition for the synchronic enterprise, it is nevertheless a theoretical fallacy.

5.2.3.1 The problem of intention

As one might anticipate, the issue of intentionality, that is, the speaker’s intention regarding “meaningful” discourse, is closely related to the general problem of meaning. Again, the problem is not new. One of the more entertaining expressions of the conflict appears, to the delight of both children and linguists, in Lewis Carroll’s *Through the Looking Glass*. In an often quoted passage, Carroll writes:

“When I use a word,” Humpty Dumpty said, in a rather scornful tone, “it means just what I choose it to mean—neither more nor less.”

“The question is,” said Alice, “whether you can make words mean so many different things.”

The question is,” said Humpty Dumpty, “which is to be master—that’s all.”
(Carroll 1960:269)

According to the code model perspective, in communication the speaker simply selects the word which means what he intends. Assuming he is speaking to a fellow member of his speech community, who thereby shares with him the code defining the intrinsic semantic interpretation of each sentence (see Chomsky and Halle 1968:3), then the hearer should understand the sentence in the same manner as did the speaker. (Note that the problem of discourse will be addressed below.) But what if the hearer does not understand the sentence in the manner in which the speaker intends? How is the code model to account for this? As explained early in this study, a strict application of the model can only attribute the phenomenon to one of two factors: (1) the communicators in fact do not share copies of the code, (2) noise has interrupted the signal.

Of course it is possible to be distracted by physical noise, or by wandering attention, which may also be considered noise; however, the noise clause will simply not cover this problem, at least not when it is applied to normal human communication. The idea of noise is borrowed from information theory, which handles noise by either circumnavigation or by statistical compensation for the damaged signal. In human communication, the speaker and hearer can be sitting side by side in a sound proof room, the speaker can say the sentence one hundred times in order to compensate for poor attention, and the hearer may still understand the sentence differently than the speaker intended. One could attribute the problem to differing code, but the problem may persist even with a married couple celebrating their fiftieth anniversary. At what point, then, should the linguist suggest that the problem is attributable to differing codes, particularly when such a suggestion implies that the communicators do not share a speech community? Strictly speaking, the model cannot satisfactorily account for the hearer having understood the signal differently than the speaker intended.

Stated in Lewis Carroll's terms, Humpty Dumpty *never* has the prerogative of using a word or expression in a novel way. The words are the master, and not the man (or egg in Carroll's example—see Carroll 1960:269). As Saussure expresses it:

A language, as a collective phenomenon, takes the form of a totality of imprints in everyone's brain, rather like a dictionary of which each individual has an identical copy. Thus it is something which is in each individual, but is none the less common to all. *At the same time it is out of the reach of any deliberate interference by individuals.* (Saussure 1983:[38])

5.2.3.2 The problem of context

The previous section addressed the problem of intention. Most linguists consider the problem of intention to be insignificant. They note that in those rare cases where ambiguity is supported by syntax, that ambiguity dissipates when the expression is viewed in communicative context. This sort of response fails to note the problem of context.

The problem of context is an extension of the problem of meaning, and is also related to the problem of intention. Simply stated, the problem is that the code model insists that context is irrelevant. In a strict application of the model, context *must* be excluded.

In part, this view stems from Shannon's information theoretic model, in which the transmitter and receiver are conceived as electronic devices. Understandably, the context in which the devices are operated has no bearing on the theory. As is discussed in section 3.4, that application may be validly extended to human communication, but only in applications concerning phonetics and phonology. That is, Shannon's theory would only address whether or not the hearer can correctly interpret sound waves and recognize their relationship to phonemes. Shannon's theory is not concerned with morphemes in any way whatsoever. As Shannon himself has said of his theory, "Somehow people think it can tell you things about meaning,...but it can't and wasn't intended to" (Horgan 1996:207-208).

The problem of context is more subtly defined by Saussure's theory of signs. Remember that in Saussure's view, the *langue* involved a fixed system of values. In a fixed system of values, context must be irrelevant, otherwise the system is easily compromised, even destroyed. A fixed-value economic market, for example, would be compromised by a context-dependent black market.

In code model linguistics, then, the system of values is presumed to remain constant and to operate independently of context, even though the manner in which the exchange is pursued and affected is considered to vary. To suggest an analogy, a customer in a restaurant cannot negotiate the cost of his meal. He can, however, determine for himself what he will order and the amount of tip he will give to the waiter. In linguistic terms, he cannot determine what his words will mean, for the meaning of the words is set. He can, however, determine for himself which words he will use and the way in which they will be presented to the communicative partner. As should be evident, this is the basis of the traditional split between semantics and pragmatics. That is, semantics addresses the meaning of the words, while pragmatics addresses the way in which those words are employed in context.

The reality of the situation, however, is that language is *not* a fixed-value system (see Harris 1987:219ff). To use the restaurant analogy again, if the problem is considered from a broader scope, it is apparent that the cost of the meal varies according to context. A lobster dinner may cost twenty-five dollars at one restaurant, fifteen at another, and five on the pier. Furthermore, the price of the meal *is* negotiated, although rarely by the individual working alone. The cost of the meal is certainly negotiated behind the scenes by the restaurateur, who estimates what he thinks his customers will pay. And it is negotiated nonverbally by the customer, who peruses the menu reading the restaurateur's prices and determines what he is willing to purchase. The cost of the meal also fluctuates

according to supply and demand. In other words, it is grounded in context and varies according to context. The same may be said of meaning.

Words do not consistently mean the same thing from place to place, independent of context of usage. Rather, meaning is negotiated, although rarely by the individual working alone. That is, meaning fluctuates according to general usage. Just as the restaurant customer has a range of prices he is willing to pay, the user of language will normally have a range of meaning he will be willing to associate (or accept as associated) with a particular word or expression. Over time and across space, the range of such accepted meaning shifts according to the “supply and demand” for a particular “exchange.”

As stated previously, Saussure was well aware of semantic change and variation. He writes: “The first thing which strikes one on studying linguistic facts is that the language user is *unaware of their succession in time*: he is dealing with a state” (Saussure 1983:[117]; italics added). It is implausible to suggest that Saussure proposed a fixed-value system in ignorance of reality. Rather, as he saw it, objectivist science and the synchronic approach made a fixed-value system a theoretical necessity. As stated previously, for linguists focusing on the problem of real language and real communication, however, it is not a theoretical necessity; rather, it may be regarded as a theoretical fallacy.

5.2.3.3 Revolutionary response to the problem of meaning

It is important to understand that revolutionary linguistics does not plunge the study of language into semantic nihilism. It simply takes a different view of the relationship between meaning and context, and thereby meaning and communication. Revolutionary linguists recognize that meaning cannot be divorced from context.

Accordingly, revolutionary theories do not isolate semantics and pragmatics. Revolutionary linguists may differ in their theorization regarding how meaning works in the mind, but they agree that notions of meaning must incorporate context. This is a significant contrast with the Saussurean paradigm.

As Saussure instructed, most linguists working in the Saussurean paradigm have made the study of linguistic structure the primary concern, relating all other manifestations of language to it (see Saussure 1983:[25]). As the *Cours* states: "Indeed, amid so many dualities, linguistic structure seems to be the one thing that is independently definable and provides something our minds can satisfactorily grasp" (Saussure 1983:[25]). In an academic context so defined, semantic concerns have been relatively neglected. Accordingly, the relationship of semantics and communication has also been relatively neglected. Nevertheless, "It is obvious, or has appeared so to many semanticists, that there is an intrinsic connexion between meaning and communication, such that it is impossible to account for the former except in terms of the latter" (Lyons 1977:32). Awareness of this fact is a major factor driving the work of revolutionary linguists.

As mentioned previously, from the view point of revolutionary linguistics, the language user's view that language is semantically static should be understood as an expression of naïve realism. Spradley describes naïve realism as the belief that, "human languages may differ from one society to the next, but behind the strange words and sentences, all people are talking about the same things" (Spradley 1980:4).

In reality, language only has the appearance of being semantically static because in general, change only comes about slowly, and thereby sometimes imperceptibly. But slow movement and fixed status are not the same thing. The movement of the hands on a clock also move slowly, and thereby sometimes imperceptibly. But, again, slow movement and fixed status are not the same thing. One would regard a theory of watches which described

the hands as fixed and immovable as being absurd. A theory of watches must account for the movement of the hands. If it does not, then it is an inadequate theory. The same may be said of a theory of language and communication which regards semantics as being of fixed status. The relegation of structural and semantic change to the domain of diachronic linguistic is an inadequate solution to this problem.

From the perspective of revolutionary linguists, the problem is a matter of equilibrium. Saussure addresses this equilibrium via the concept of collective inertia:

Collective inertia resists all linguistic innovations. We come now to a consideration which takes precedence over all others. At any time a language belongs to all its users. It is a facility unrestrictedly available throughout a whole community. It is something all make use of every day. In this respect it is quite unlike other social institutions. Legal procedures, religious rites, ship's flags, etc. are systems used only by a certain number of individuals acting together and for a limited time. A language, on the contrary is something in which everyone participates all the time, and that is why it is constantly open to the influence of all. This key fact is by itself sufficient to explain why a linguistic revolution is impossible. Of all social institutions, a language affords the least scope for such enterprise. It is part and parcel of the life of the whole community, and the community's natural inertia exercises a conservative influence upon it.

None the less, to say that a language is a product of social forces does not automatically explain why it comes to be constrained in the way it is. Bearing in mind that a language is always an inheritance from the past, one must add that the social forces in question act over a period time. *If stability is a characteristic of languages, it is not only because languages are anchored in the community. They are also anchored in time. The two facts are inseparable.* Continuity with the past constantly restricts freedom of choice. If the Frenchman of today uses words like *homme* ('man') and *chien* ('dog'), it is because these words were used by his forefathers. Ultimately there is a connexion between these two opposing factors: the arbitrary convention which allows free choice, and the passage of time, which fixes that choice. It is because the linguistic sign is arbitrary that it knows no other law than that of tradition, and because it is founded upon tradition that it can be arbitrary. (Saussure 1983:[107-108]; italics added)

While some theorists, including both normal and revolutionary linguists, differ somewhat with Saussure regarding the arbitrary nature of signification, few venture to argue with Saussure's proposals regarding collective inertia. Revolutionary linguists agree with the general notion of collective inertia. Where they differ with Saussure and thereby

depart from the Saussurean paradigm is in regard to how one should respond to this reality.

In Saussure's view, in light of collective inertia, it is entirely plausible that one would treat language as a fixed system. In his view, language is fixed by being anchored in the speech community, across both community-space (that is, the speech community spread across geographic space) and time.

In the view of revolutionary linguists, however, these same facts are used to argue that language should *not* be treated as a fixed system. In that view, if language is so anchored in the speech community, across both community-space and time, then a model of communication should account for the contextual influence of the community and the influence of time. It simply will not do to support a model of communication which regards these anchors as only having a constraining *effect*, but which does not account for the active *affect* of these same anchors. Again, as Lyons writes, "... there is an intrinsic connexion between meaning and communication, such that it is impossible to account for the former except in terms of the latter" (Lyons 1977:32).

5.2.4 The problem of discourse

The fourth major area in which the code model account proves anomalous is the problem of discourse. While the problems of variation, abstraction, and meaning are closely related, the problem of discourse is somewhat distinct.

Crystal defines the term discourse as follows:

[Discourse is] a term used in linguistics to refer to a continuous stretch of (especially spoken) language larger than a sentence At its most general, a discourse is a behavioral unit which has a pre-theoretical status in linguistics: it is a set of utterances which constitute any recognizable speech event (no reference being made to its linguistic structuring, if any), e.g. a conversation, a joke, a sermon, an interview. (Crystal 1997:118)

As has been discussed, the code model view depends upon a building block view of sentence construction. Similarly, it would suggest a building block view of discourse construction. The problem of discourse is that, in typical discourse, the building block pieces don't make a whole. Linguists often speak of a unit of discourse as involving continuous speech; however, strictly speaking, discourse involves *discontinuous* speech. The string is broken into sentences via pauses, or in the case of written discourse, the little spaces between the period and the capital letter. While it may seem to some linguists that the code model can account for sentences, it should be clear that it cannot account for the inter-sentential "material," for there is nothing there for which it may account. This is not to neglect the existence of elements embedded within or affecting the respective sentences, such as discourse markers, participant reference, anaphora, and deixis. It is simply to point out that these are not always present.

The problem is compounded by the fact that speakers commonly approach discourse via a principle of economy. For example, the speaker may consider the discourse to involve logical or sequential relations of "A," "B," and "C." But if the speaker supposes that the hearer can infer "B," then he may readily skip from "A" to "C." In effect, this serves to increase the inter-sentential gap. Again, the code model cannot account for something which is not there.

Code model accounts typically explain the process of this economic decision as depending upon shared or mutual knowledge. That is to say, the speaker can leave out material which, as he knows, the hearer is already aware. To some extent this is accurate, but its explanatory value is limited. The first limitation is the problem of variation. Rigorously applied, the notion of shared knowledge cannot account for variations in speaker and hearer knowledge. Speakers commonly leave out information of which they are fully aware the hearer has no knowledge. The second limitation is that, strictly

speaking, the code model account describes meaning as operating independently of context. (This has been discussed in section 5.2.3.2.) A notion of decoding which depends upon shared knowledge requires that shared knowledge be attached to the code as a supplement. In effect, this involves revision to the code, and unless the copies of the code held by both transmitter and receiver are simultaneously updated, the communicative process will be unsuccessful.

The notion of encoding cannot consistently account for the principle of economy and the decisions regarding which logical components may be left out, nor can the notion of decoding account for the hearer's process of comprehension. One may conjecture that this problem is a major reason why code model linguists have typically found it difficult to explore language structures above the sentence level.

Many linguists attempt to accommodate the problem of discourse with some version of notional structure, which is supposed to operate alongside or "above" the surface structure (see Longacre 1983). Circular logic is sometimes employed, however, in that code model linguists see the text as "containing" meaning. In this way, the text is presumed to be speaking for itself. With this view, the notional structure is characterized as being represented in the text.

Of course, the surface structure of the discourse text is simply "a string of beads," that is, it is no more than a sequence of sound waves or "little dark marks" (Sperber and Wilson 1986:1, see Reddy 1979). The relationship between the beads and the plan for how those beads are strung is something that the linguist, as a sophisticated hearer or reader, must somehow *infer*. R. J. Reddick writes:

What the text then does is trigger what is already in the mind of [the] interpreter, and thus the text will automatically seem clear. If they are not already familiar, all that the text can do is trigger inferences in the interpreter's mind that might enable that interpreter to construct those ideas, provided that what is in the text triggers the right inferences from the interpreter's preexisting ideas. It is easy for us to assume, erroneously, that everyone brings the same

ideas to any particular text, and this assumption blinds us to the diversity among readers. (Reddick 1992:218)

Various schools of thought have been developed for accounting for how the common hearer and reader work through this process of inference and comprehension, including how embedded elements (discourse markers, deictics, and so forth) are processed in comprehension. Various theories also attempt to account for how the speaker or writer “plan” and produce the text

5.2.4.1 Revolutionary responses to the problem of discourse

As do some code model linguists, revolutionary linguists see language as naturally functioning in discourse contexts. But in contrast to code model-oriented discourse studies, revolutionary linguists typically resist not only the extraction of sentences from discourse, but also the extraction of discourse from context of use. Of course, there is a practical limitation in the scope of application. For example, revolutionary linguists don't necessarily consider the use of a particular paragraph in the context of North America. While some discourses may have such expansive contexts, most will be more limited. In practice, then, the discourse units handled in revolutionary approaches are analogous to those handled by linguists employing a code model-oriented approach. The difference is in how the linguist views the processes of discourse production and comprehension.

Whereas the code model linguists typically think of the text as being meaningful, revolutionary linguists describe the text as being used in a meaningful way. The text does not have meaning of its own. Rather, it is employed in a meaningful way by the speaker, and understood in a meaningful way by the hearer. The speaker and hearer, however, may not understand that text in the same way. Revolutionary linguists recognize that the text itself, once produced is autonomous from the speaker. It is also autonomous from the

hearer. The speaker's and hearer's processes of production and comprehension, however, are grounded in context.

Another difference between revolutionary and code model-based approaches to discourse is that, rather than seeing the text as being composed of coded segments with gaps, revolutionary linguists see the text as being related to a conceptual unit, rather than simply a unit which would have been more traditionally been considered "linguistic." For example, cognitivists envision the text as being related to and organized via schema. The speaker's goal in producing the text then, is to stimulate the hearer to conceive of a particular scheme. Within such a view, the fact that gaps exist between respective sentential strings may then be comparatively insignificant, since the manner in which the strings relate to the schema may be more significant than how the strings are supposedly related to one another.

This notion of schema is, of course, related to the idea of notional structure. For the revolutionary linguist, however, the schema exist in the mind of the speaker and hearer. They are not in the text.

The notion of schema may also seem to bear resemblance to the notion of shared knowledge. The two notions are not equivalent, however, in that it is not presumed that speaker and hearer will necessarily comprehend the text according to the same schema. In this way, the revolutionary linguist emphasizes the process of comprehension, rather than the "meaning" of the text.

5.3 Other models

As was addressed briefly in chapters 3 and 4, the code model and its constituent models are not the only models or metaphors of communication recorded in the literature; however, they are the most pervasive within linguistic literature. This section provides a

cursory review of additional models and metaphors. It should be noted that some of them depend upon the code model or are otherwise related to it in some way.

The study examines these models from the perspective of linguistic concerns and the present study of the code model. Where relevant, the study address how the models would handle particular code model anomalies.

5.3.1 Mechanistic models

Ronald Langacker has provided some discussion of metaphors in linguistic metatheory, including the container and conduit metaphors as addressed by Reddy and reviewed by Lakoff and Johnson (1980; also see Johnson 1987, Lakoff 1987, Moore and Carling 1982). Langacker also mentions the dictionary view and the building-block metaphor (see Langacker 1987:161, 1991:507-508):

The conduit metaphor dovetails with the dictionary view of lexical semantics, which holds that a word's linguistic meaning is strictly limited and distinct from general knowledge, and also with the building-block metaphor, wherein the meaning of a complex expression is constructed just by stacking together the meanings of its parts in accordance with general combinatory rules. (Langacker 1991:508)

Langacker continues, adding that, "This way of thinking and talking is so ingrained that there is no point trying to avoid it. We will be well advised, however, to remember that it represents a blatantly inaccurate folk model capable of leading us into serious error to the extent that we tacitly adopt it for theoretical purposes" (Langacker 1991:508).

In addition to these common metaphors, the origins of which may be found in folk theory, Langacker suggests that the generative tradition has contributed to the use of several additional metaphors. These include the machine (or assembly line) metaphor, electronic device metaphors (i.e., language as black box, components, device, and modular

system), and mathematical metaphors (i.e., language as algorithm, computer program, and formal deductive system).

Of the latter three types, Langacker comments: "These three classes of metaphors—based on machines, electronics and mathematics—all manifest an overarching metaphor that construes the mind as being analogous to a serial digital computer" (1991:509). Highlighting the role of such metaphors in the structure of tacit knowledge, Langacker continues:

The power of such a metaphorical system should not be underestimated. Far from being merely heuristic, it can be recognized as the source of tacit but nonetheless pervasive attitudes, working assumptions, and methodological stances. Although perhaps nobody would defend it as being fully appropriate, still it offers conceptual coherence for views explicitly held, biases research towards certain kinds of approaches and subject matter, and determines whether an idea will be adopted by default or accepted only reluctantly even when supported by overwhelming evidence. Let us note just a few examples. The attitude that a linguistic description ought to be as brief and economical as possible (consistent with generating the right forms) coheres with the standard conception of optimality for machines (which are supposed to be efficient), computer programs (quick-running), and mathematical proofs (sparse and elegant). The analogy to formal logic and digital computers engenders the expectation that linguistic expressions should be describable in terms of well-defined operations on strings of discrete symbols (or other discrete representations, such as phrase trees and feature bundles). Also, the fundamental notation that a phenomenon has a single "right" analysis, and that the proper description of languages must conform to a specific kind of formal theory, is reinforced by the knowledge that a mechanical or electronic device operates in a particular way, and that a computer does what it does because a specific program tells it to. (Langacker 1991:509)

Langacker also comments on the relationship such metaphors may have to the idealized notion of the "hard sciences." He warns that these metaphors may have attractive qualities that are disproportionate to their actual value in guiding analytical investigation:

In addition to their metaphorical coherence, such notions resonate with our idealized cognitive model of "hard science." Hence they are generally considered self-evident and uncontroversial, so obvious that they are simply taken for granted. Yet they are all subject to legitimate question, as is the appropriateness to natural language of the metaphorical system they reflect. (Langacker 1991:509-510)

In an illuminating footnote he adds: "It is no doubt incidental that they [the metaphors] have the further advantage of defining the task of linguistic investigation in terms that correspond to what most linguistic theorists are best equipped to do" (Langacker 1991:509).

While Langacker does provide a good review of these metaphors and their use in linguistics, showing special concern over metaphors that build upon the idea of a "digital computer," it is unfortunate that he does not address the code model of communication, for some of these lesser metaphors have their origin in the code model. The mechanical, electronic, and computer metaphors are *directly* related to use of the code model and related information theory in psychology and linguistics. As has been discussed, information theory was initially developed in the context of electrical engineering and some of its earliest points of entry into linguistics were through psychology.

Langacker's attribution of these "digital computer" models to the generative tradition is also somewhat misdirected. It is true that that the generative tradition has emphasized some of these metaphors, but as has been shown, use of the code model upon which they are based far exceeds the generative tradition.

5.3.2 Motor theory

In discussion of Lockwood's approach to stratificational linguistics, Edmondson and Burquest (1998) briefly refer to the notion of encoding and decoding. They continue:

As appealing as the idea of 'language as a code' may be, it is not the only model conceivable. Indeed, the dominant paradigm of speech perception, the motor theory of speech, rests on quite different assumptions. Vastly oversimplifying, the motor theory claims that speech perception involves some kind of matching of internal signal and the incoming signal. Humans do not obviously comprehend or analyze by analysis. In fact, we may use analysis by synthesis. In light of the motor theory, the need for bidirectionality in one's linguistic paradigm becomes less acute. (Edmondson and Burquest 1998:96).

Motor theory is a theory of speech perception proposed by A. M. Liberman (for recent versions of the theory, see Liberman 1996, especially 237-265). Concerning motor theory, Bothamley writes: "This hypothesizes that speech is perceived by mapping the acoustic properties of an input onto some internal representation of speech. Little physiological evidence exists to support Liberman's theory" (Bothamley 1993:354).

As a theory of speech perception, motor theory addresses the problem of reception. It does not, however, necessarily account for the supposed semantic decoding of the signal. Rather than contrasting with the code model, it is more likely that motor theory is typically employed as a supplement to the code model, actually embedded within a speech chain version of the code model account (see again figure 3.8).

5.3.3 Berge's four types of communication models

Berge (1994) addresses four basic models occurring in communication research: (1) the linear, conduit model, (2) the circular, dialogic model, (3) the feedback, interaction model, (4) the self-regulatory (autopoiesis) model. In addressing the first of these, the linear, conduit model, it is clear that Berge is addressing the conduit metaphor and its integration in the code model. His comments regarding the model unfortunately misrepresent the relationship between the conduit metaphor and information theory. Otherwise, however, his comments are instructive.

The simplest model of communication has been called the conduit model (Reddy 1979) because of its underlying assumption that language functions as a sort of channel, or tool for transferring a linguistic message from a source (or sender) to a destination (or hearer). This idea of communication has some of its roots in information theory. To separate what they call information from communication, certain philosophers of language (e.g., Grice) have advocated the idea that communication proper is characterized by intentional communication, or what Grice calls 'non-natural meaning.' The idea is that the addresser ('sender') intends that the message (or utterance) will cause what is called an effect in the addressee ('receiver'). The only necessary condition is that the addressee recognize this intention. (Berge 1994:614)

Berge suggests that this general approach to defining communication involves teleological modeling (Berge 1994:614). Teleological models are based upon judgements regarding the *purpose* of the phenomenon. In the case of communication models, the modeler assumes that communication exists for the purpose of conveying information, therefore the model is built around this purpose and the effectiveness of a communication event is measured by the success to which the information is “accurately” conveyed. In this regard, it should be clear that Saussure’s speech circuit is, similarly, a teleological model.

Berge list the problematic aspects of linear, conduit-type models as follows:

- (1) “the notion of effect, or perlocution on the addressee’s side” (Berge 1994:614)
- (2) “the notion of intention on the addresser’s side” (Berge 1994:614).

He asks, “How are we to build a theory of communication on such vague terms, and how are we to find out what is/was the intention in a message and how are we to distinguish between the different effects?” (Berge 1994:614). Other problematic areas include “the basically individualistic and monological views of communication that advocates of such models implicitly accept” (Berge 1994:614). By “monological,” refers to the fact that the code model treats communication as alternating monologues. This problem is sometimes referred to as monodirectionality. Berge suggests that the other three models he addresses offer a challenge to the linear, conduit-type model.

The second type of model Berge addresses is the circular, dialogic model. These models are similar to linear models, but they attempt to accommodate the problem of monodirectionality. Berge writes:

The basic idea in what is here called the circular or dialogic model, is that for communication to take place, it is not sufficient that an addresser manifests his intention in a message which results in an effect in the addressee. It is also necessary to give the addressee a more active role in communication. (Berge 1994:615)

Berge suggests that this active role is created in two ways: "First, this active part is the more or less conscious interpretation process that the addressee must be involved in *for the intended message to get through*" (Berge 1994:615; italics added).

Second, a more or less expressed manifestation of the intended effect in the form of a response, answer, action, etc. from the addressee is necessary for the addresser to understand that his message has been received---in fact, *is* a message. Without a response of some sort, the addresser would be left in a situation where he is at best talking to himself, at worst is indulging in a monologue more typical of madness. Thus, the interpretation requirement is not restricted to the addressee alone. The addresser, too, has to identify some sort of signal in the addressee's message which can be interpreted as a response or reaction to the intended message.

In this way, communication can be seen as a system of questions and answers, or as a sort of cooperation where the communicators are actively organized in the construction of the message. (Berge 1994:615)

This model can basically be seen as the code model mirrored against itself so that the arrows alternatively point back to the original addresser. As Harris notes (1987:214-215), Saussure's speech circuit employs this basic pattern. In contrast to Saussure's speech circuit, which suggests that comprehension should be mechanical, Berge's notes that the circular, dialogic model suggests that the message will be insured a successful transmission through the back-and-forth, guess-and-check process.

As with the code model, the emphasis is on intentionality and measurement based upon the integrity of the transmission. The model requires an honesty principle in order for the testing phase to work. Accordingly, the model considers "dishonest" communication to be anomalous. Such communication would seem to contrast with the teleological emphasis on transmission of information, however, the concern over "misinformation" belies this apparent contrast.

Circular, dialogic models are naïve in their necessity of response. An addressee may understand an addresser quite well, but nevertheless not respond. In such a situation, the loop would not be closed. The model is also naïve in supposing that a back and forth

series of exchange will insure accuracy of the transmission. Each exchange is equivalently weak in that the guess and check process is simply a repetition of the basic pattern.

The third type of communication model Berge addresses, the feedback, interactional model, treats the problem of communication more broadly than do the linear and circular models. Berge writes:

The third model of communication distinguishes itself from the dialogical model by doing away with the notion of intention altogether. ... Communication would include all those processes by which human beings influence one another. In its most extreme form, this model entails that all behavior can be said to be communicative. The interaction of human beings is characterized by the necessity to communicate; this necessity is superior to the notion of intention, which is based not only on the will to communicate, but also the will to interpret. Communication is thus part of perception; attention to and interpretation of communication are part of the process of perceiving.

What remains in this model are the principles of mutuality and reciprocity as basic requirements for communication to take place. ... [Note, however, that] Communication, in the feedback model, is not characterized by a search for what could be called mutual knowledge, consensus, or intersubjective understanding. (Berge 1994:615)

As Berge notes, feedback, interactional models are not without problems, the main problem being how to distinguish communication (that is, intentional elements) from information (which would include unintentional elements and noise) (Berge 1994:615).

He writes:

Advocates of this model focus on the temporal nature of communication; communication viewed as an enduring process which imposes meaning upon disturbances and noise, through the selective processes of information, message conveyance and understanding. Such a selection process is, of course, determined by the internalized language of the communicators, and is governed by other semiotic systems as well. (Berge 1994:615)

The fourth and final type of communication model Berge addresses is the self-regulatory (autopoiesis) model. He suggests that, in some senses, the model is a radicalized version of the feedback model; however, the autopoietic model does not treat the principles of reciprocity and mutuality as being in any way essential. Without these principles, the

model suggests "something as seemingly paradoxical as a solipsistic model of communication" (Berge 1994:616). Berge writes:

In this model, the communicators ... do not communicate in order to transfer and create a message (as in the conduit and dialogue models), or even to create some information, a conveyed message, and an understanding, but simply to integrate elements from the communicative situation (the environment) which can contribute to the communicators' so-called self-regulation and self-creation (hence the term 'autopoetic'). This self-regulation and self-creation is an individual, idiosyncratic version of an interaction input. A basic goal of this self-regulation or autopoiesis is to create a difference with respect to all other (real or potential) communicators. In this sense, communication is necessary for the individual in order to be constituted as an individual. The communicators are seen as closed systems, insofar as nothing can be integrated which is not specified in the system's own structure. It is important to note that the system is not a static structure, but rather a process. Communication is self-reflection, characterized as an unceasing search for functional substitutes. (Berge 1994:616)

Berge notes that the autopoetic model supports a view of certain kinds of texts, such as written messages, which is quite distinct from that traditionally supported by linguistics. In particular, the model recognizes written texts as "permanent self-referential and autopoetic activity on the part of the individual communicator. Oral dialogue is thus reduced to one type of communication among others" (Berge 1994:616).¹²

Berge's discussion of these various types of models provides a useful summary. Unfortunately, metonymy in the literature can make the general discussion somewhat difficult to follow. The discussion is confused by three closely related senses of the term communication. Berge mentions two of these, process and content, in his introduction. He does not, however, employ these modifiers in addressing the issue. The senses of communication involved are as follows:

- (a) communication (the process),
- (b) communication (the content) of communication (the process), and
- (c) communication (the psychological-emotional-social effect) of communication (the content) and communication (the process).

Literature on communication may address one or another of these senses, or sometimes all three, but rarely explicitly differentiates the three senses.

5.3.4 Dance's helical model

In a 1970 article titled "A Helical Model of Communication," Frank Dance introduced his helical model (Dance 1970:103-107). Dance and Larson (1972:184) summarize the major concerns of that model as follows:

Varying geometric models have been suggested to represent the speech communication process. The process is neither linear nor circular. Obviously, one's future speech communication is affected by one's past and present speech communication—there is some feedback, not just a simple progression. Just as obviously, our speech communication never concludes exactly where it began—there is some forward movement. The geometric model which may be most helpful is the helix, similar to the thread of a screw, or an extended "slinky" toy held upright. When viewed as helical, one's speech communication at one and the same time moves forward and yet gracefully curves back on itself in progressive motion. The intertwining of two or more helices, as in interpersonal or person-to-persons speech communication, is reminiscent of the double helix of genetic structure and testifies to the fantastic and fascinating complexity of human speech communication. An individual's speech communication is never truly discontinuous; there is always the connecting thread of individual being. This filament of sameness mirrors the dynamic interrelationship of levels, functions, and modes *in* role. (Dance and Larson 1972:184)

Concerning their notion of role, Dance and Larson write:

Throughout life a person moves through varying roles, displaying in each a slightly different constellation of speech communication levels, functions, and modes. When the constellation exhibits what we consider an appropriate or acceptable balance, we tend to accept the individual's speech communication behaviors as falling within the range called average or normal. When the constellation seems warped or incongruent, we often question, either covertly or overtly, the appropriateness of that person's speech communication behavior. (Dance and Larson 1972:183)

Various linear and circular models have incorporated a simple feedback loop in order allow the speaker to hear himself. Dance's model also accounts for that type of feedback, which may be called "momentary" feedback. But in contrast to linear and

circular models, Dance's helical model describes the interaction of past and present *communicative events*, all the while moving the present event forward.

Dance's model is not without problems, however. The characterization of two or more helices as being intertwined, as in the "double helix of genetic structure" (Dance and Larson 1972:184), suggests that, via their helices, the communicative partners may be linked. The threat here is that such a linkage will evoke the familiar notion of a conduit, albeit a spiraling one. Being understood in such a way, the notion of intertwined helices simply produces a complex cork-screw version of the code model.

5.3.5 Reddy's toolmakers paradigm

As discussed in chapter 3, and by Berge in the previous section, Reddy (1979) provides a review of the conduit metaphor of communication and its impact on understanding of the communicative process. Reddy recognizes that communication demonstrates adherence to the second law of thermodynamics, upon which Shannon's information theory depends. Reddy suggests that his own alternative metaphor, which he calls "the toolmakers paradigm," may better account for that law, and that the conduit metaphor is at odds with the law.

Reddy calls his model the "toolmakers paradigm." He describes that model via an analogy built around a wagon wheel arrangement of cells, each of which houses somewhat distinct environments and a single human participant. The participants are isolated from one another, so that they have no direct interaction. They are aware of each other's existence, but are not aware that the different cells house distinct environments.

At the hub of the wheel shaped affair, the cells have a small slots through which the participants can pass slips of paper. They cannot, however, pass anything else, and they cannot speak through the doorways. Exchange of these slips of paper is the only

means of communication between the participants. None of them are literate, however, so instead of writing, they can only draw pictures.

Working within his cell, one of Reddy's captives invents a tool, a rake shaped affair made of sticks. Thinking that his neighbor may benefit from his invention, he draws plans for the contraption and passes them through the slots to his neighbors. What the inventor doesn't know is that, whereas he lives in a forested cell, his neighbors cell is more barren and rocky. The neighbor has fewer sticks available, and he mistakenly interprets the drawings, so that he makes the head of the "rake" from stones. Working with his own materials, the neighbor sets about making his own tool, which turns out something like a hoe, which he finds unwieldy. Accordingly, he modifies the tool into a two forked spade. The process continues, with each participant interpreting the instructions in a different manner and producing a somewhat different tool. Concerning this analogy, Reddy writes:

In the analogy, the contents of each environment, the "indigenous materials," represents a person's repertoire. They stand for the internal thoughts, feelings, and perceptions which cannot themselves be sent to anyone by any means that we know of. These are the unique material with which each person must work if he is to survive. The blueprints represent the signals of human communication, the marks and sounds that we can actually send to one another. We shall have to ignore the question of how the system of instructions became established, even though this is an interesting part of the story. We shall simply assume that it has reached some sort of steady state, and shall watch how it functions. (Reddy 1979:293)

Applying the basic principles of his model to a more realistic situation, he writes:

There are no ideas whatsoever in any libraries. All that is stored in any of these places are odd little patterns of marks or bumps or magnetized particles capable of creating odd patterns of noise. Now, if a human being comes along who is capable of using these marks or sounds as instructions, then this human being may assemble within his head some patterns of thought or feeling or perception which resemble those of intelligent humans no longer living. But this is a difficult task, for these ones no longer living saw a different world from ours, and used slightly different language instructions. (Reddy 1979:309)

Following Reddy's analysis of the conduit metaphor, it is quite apparent that ideas aren't literally stored in libraries. His toolmaker analogy is useful to the extent that points out weaknesses of the conduit metaphor view of communication, and that seems to be Reddy's objective.

Reddy's toolmaker's paradigm does suffer, however, from two oversights. First, he refers to the drawings as instructions, writing of "using these marks or sounds as instructions," "slightly different language instructions," and so forth. In so doing, he is violating his own principle. The drawings are raw information, dark marks on a page.

Secondly, in describing the scenario for his toolmaker's paradigm, Reddy falls victim to the logical fallacy of synchronism, that is, the "chronological arrangement of historical events and personages so as to indicate coincidence or coexistence" (Mish 1983). Note the following: "We shall have to ignore the question of how the system of instructions became established, even though this is an interesting part of the story. *We shall simply assume that it has reached some sort of steady state, and shall watch how it functions*" (Reddy 1979:293). As discussed in regard to the code model, the Saussurean paradigm similarly suffers from this theoretical problem. In regard to the library example, however, Reddy does comment upon the effect of language change: "But this is a difficult task, for these ones no longer living saw a different world from ours, and used slightly different language instructions" (Reddy 1979:309).

The problem with Reddy's synchronism is that he has subjectively decided whether or not language change is significant. The model of language and communication should be able to account for language variation across space and time, without requiring the theoretician to make a subjective judgement concerning that variation.¹³ The requirement of interpretation is the same regardless if the text was written by your next door neighbor yesterday or by an Egyptian scribe four thousand years ago. The difference

is only one of degree, and not of kind. Only the author himself knows exactly what was “meant” in the recording of the dark marks on the page. As Locke points out, tomorrow even the author may not mean by these same words what he meant today (see section 3.2.2.2.3).

5.4 An alternative model of communication

As discussed by Kuhn, each paradigm defines its own set of problems (1996:94). If alternativists were only interested in solving the problems defined by the code model, there would really be no point in developing an alternative; the code model itself would be quite sufficient. It is the anomalies—those inconsistencies and problems which are *not* adequately handled by the code model—which drive the interests of revolutionary linguists. Anomalies require revolutionary linguists to rethink not only those areas which the code model handled, but also those which it did not.

As discussed in chapter 2, models are metaphors. They can have a constraining effect on comprehension and experience, and subsequently behavior. New metaphors, however, can often redirect the foci of attention. As quoted previously, Lakoff and Johnson write:

The very systematicity that allows us to comprehend one aspect of a concept in terms of another (e.g., comprehending an aspect of arguing in terms of battle) will necessarily hide other aspects of the concept. In allowing us to focus on one aspect of a concept (e.g., the battling aspects of arguing), a metaphorical concept can keep us from focusing on other aspects of the concept that are inconsistent with that metaphor. For example, in the midst of a heated argument, when we are intent on attacking our opponent's position and defending our own, we may lose sight of the cooperative aspects of arguing. Someone who is arguing with you can be viewed as giving you his time, a valuable commodity, in an effort at mutual understanding. But when we are preoccupied with the battle aspects, we often lose sight of the cooperative aspects. (Lakoff and Johnson 1980:10)

Such shifts in attention and development of new metaphors can sometimes be generated via a “planned incongruity.” By this is meant an intentional reordering of

logical relationships in ways that had previously seemed illogical (Burke 1984:90-91). As Shibles suggests, when used in such a way, "Metaphor may be thought of as an hypothesis, an exploration of new causes" (Shibles 1971:20).

In the terms used by the ancient Greeks, such an argument involves *dissoi logi*—an effort to generate "double arguments" (Lanham 1991:57-59). It is an effort to "pick up the stick by the other end," all-the-while holding the conviction that *no single argument* will capture the whole. Has the code model of communication characterized generalizations important to linguists? The longevity of the model make it abundantly clear that it has. Many of the men and women who have used it for the last fifty years used it to great profit and with satisfaction. The point to be made here is this: *The code model is not the only model of communication possible*. If this is true, then one might reasonably ask a related question: *How might the discipline of linguistics be different if linguists employed an alternative model of communication?*

Actually offering an alternative model is perhaps the most succinct way to point out that the code model is not the only way in which one might conceive of communication. It also involves great risk. As T. J. Tally points out, it is easy to offer criticism, "But if you want to end a war, you have to solve the problems the war solves, without the war" (1997:4). In contrast to certain approaches considered in chapter 4, which involved efforts to "patch up" the code model, an alternative model requires an effort to account for communication in a manner which is distinct from the code model account.

Where as the code model depends upon COMMUNICATION IS CODING EVENT, COMMUNICATION IS TRANSMISSION, and COMMUNICATION IS DECODING EVENT conceptual metaphors, the alternative model developed here depends on a COMMUNICATION IS CREATION conceptual metaphor, with artist-

artifact components. It is important to highlight the artist-artifact components as being distinct from the transmitter-signal (i.e., code model) components of the code model metaphor. Without adequate distinction, the reader may too easily read the code model perspective back onto the alternative description. For some readers, this strong distinction may seem excessive. As Brown, Black, and Horowitz wrote of their own efforts to explain an alternative perspective, “We forsake conservatism on this occasion for the excellent reason that the thesis proposed is so alien to most thinking ... that it needs to be brought forward strongly so that we may see that its unpopularity has not been deserved” (1955:272). It can be difficult to discuss the implications of an alternative model, however, particularly when alternative terminology is lacking. The metalanguage currently available has been employed in code model linguistics for almost fifty years. It can take considerable effort to overcome a pattern of expression so entrenched.

5.4.1 The alternative model

At least for the purposes of the present study, the model graphically presented in figure 5.2 serves as an alternative model. In an effort to avoid preferential representation of any particular revolutionary school of linguistics, the model will simply be called “the alternative model.” The model reflects the present author’s understanding of the interests and perspectives of revolutionary linguists addressed in this study. It should be understood, however, that the alternative model is not proposed as the singular replacement for the code model, but as an antithesis—an essential element in the evaluation and evolution of linguistic metatheory. Undoubtedly, other characterizations could also be developed which would serve a similar purpose.

In this graphic representation (figure 5.2), the interlocutors are represented by a circle and square. The speaker’s thoughts are *concept A*, while the hearer’s understanding is labeled *concept A’*. *Concept A’* may approximate *concept A*, but it is presumed that the

two will never be identically the same. In this model, it is not supposed that words and structures have meaning, but that they have a *history of use*.¹⁴ Speaker and hearer each maintain their own history of use collage, labeled *collage*. The triangle in the center represents the text. It is label “artifact,” as it is “an object made by human work” (Neufeldt 1989:24). It’s creation and its interpretation are grounded in the context of that work. Once created, however, the text is an historical artifact. In that respect, it is autonomous of the interlocutors. The history of use collage manages encyclopedic knowledge of artifact use which the interlocutors have experienced, both as hearers and as speakers.

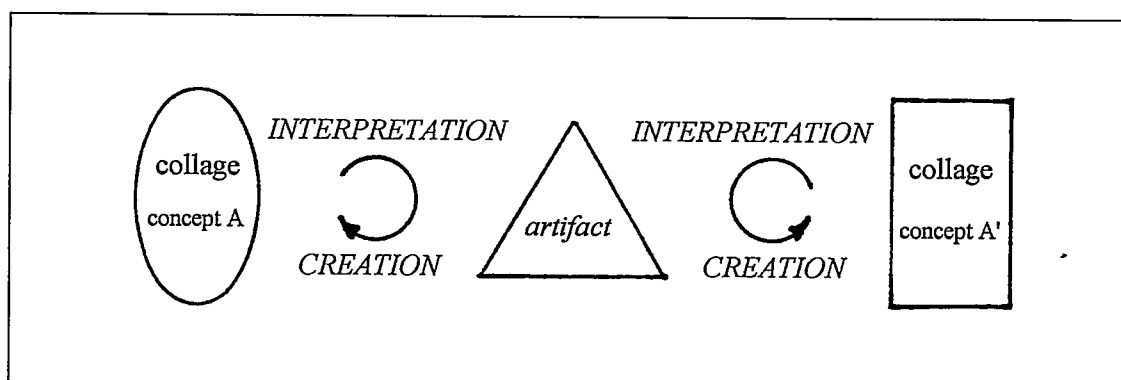


Figure 5.2. The alternative model of communication, as applied to monologue.

As the text is considered an artifact, the graphic representation does not connect the interlocutors with arrows, for there is no connection, by way of a communicative link or channel. The recycling arrows in the graphic representation represent a hermeneutic helix, insuring a feedback process *and* allowing for “the progressive modification of the communication situation through time” (Harris 1987:214).¹⁵ The helixes provide the interlocutors constant feedback as they work through simultaneous processes of interpretation and creation, thereby providing a means of negotiating meaning and evaluating semantic equilibrium.¹⁶

When speakers converse they each interpret the artifact the other has produced, as well as the artifact they have themselves produced. These artifacts do not simply consist of language, but also incorporate the complete communicative and contextual environment, so that pragmatic concerns cannot be isolated from the concerns of discourse production and comprehension. Included in this is the fact that the hearer may interpret as being communicative various artifacts which the speaker had not intended to be a part of the communicative expression.

As the hearer interprets the artifact, he assembles and revises the developing concept A' by comparing it with his history of use collage. The degree to which the hearer considers an artifact to be normative or eccentric is determined by its comparison to the history of use collage. Concept A' is linked to the history of use collage during concept development, but it does not have to exactly match any previous use in that collage. The collage is organized via prototypes, rather than a bounded-set category system. Accordingly, novel uses can be linked to existing prototypes. The edges and centers of the prototype structures are shifted as necessary to accommodate experience in language use. Modification occurs in response to swings in how the speech community produces and uses various communicative artifacts. History of use collages are individualistic, as are the respective prototypes structures they employ. A hearer and speaker may maintain very similar collages, but there is no guarantee of such. Since the collage is built and modified according to experience with various usage, speakers who communicate regularly with one another (or who share an active communicative network) may maintain *approximate* equilibrium in their patterns of use.

It is important to understand that this equilibrium can *never* be more than approximate. Since each use of a language structure occurs in a distinct socio-temporal context, even if the syntactic pattern is constant, the semantic association is distinct.¹⁷ This

creates a state of constant variation—often subtle, but nevertheless constant. The result of this constant variation is the continued evolution of individual history of use collages, so that no two collages ever match exactly. Accordingly, the patterns of use within the communicative network are always in a subtle state of imbalance and change.

In applying the model, it is important to slightly differentiate monologue and dialogue. For ease of discussion, figure 5.2 characterizes a monologic situation. In representing dialogue, however, the model may be slightly recast, as is presented in figure 5.3. In this representation, the intention is to emphasize dialogue as a corporately produced artifact. In dialogue interlocutors jointly contribute to creation of a dialogic artifact. The dialogue itself is an artifact, rather than dialogue being composed simply of sequential monologic events.

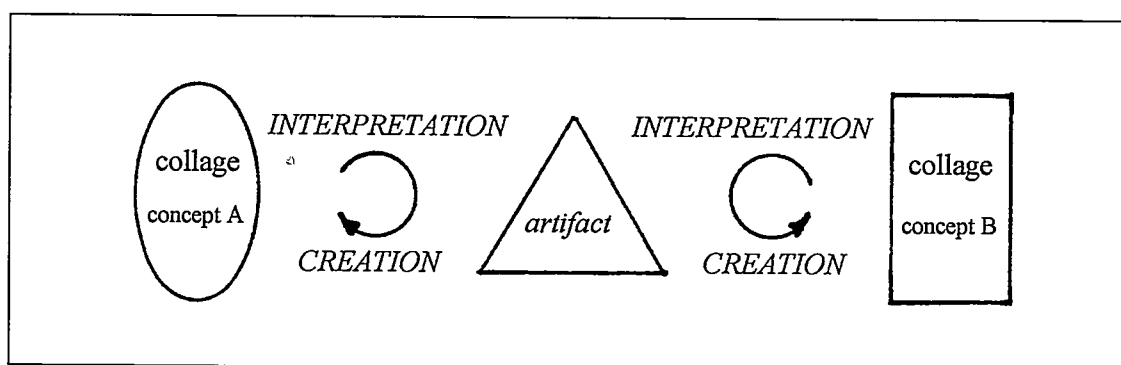


Figure 5.3. The alternative model of communication, as applied to dialogue.

5.4.2 Alternative model presuppositions

As a means of discussing the distinctive qualities of this alternative model as related to the code model, it is helpful to first recap the axioms of code model linguistics. The alternative then can be more easily contrasted with the code model. As discussed in section 3.4, these axioms are:

- Natural languages are codes defining the correspondence between sound and meaning.
- Languages (i.e., codes) are systematic, distinctive, and have an existence independent of any given speaker or hearer.
- Speaker and hearer must share a code in order for successful communication to proceed.
- The text conveys meaning.
- The speaker/author of the text encoded a message when he produced the text.
- Those receiving the text decode the message when they hear/read the text.
- Communication is successful when the message received is the same as that sent.
- Communication may be inhibited by noise.
- The speaker and hearer are connected via the channel of communication.
- Communication requires intention by the speaker and response by the hearer.
- The linguists' problem lies (primarily) in defining the code and (secondarily) in defining the processes of transmission and reception.

Following the order of the axioms as presented, the discussion presents alternative assumptions in response. Each code model premise is provided as a heading for its alternative-perspective counterpart.

- Natural languages are codes defining the correspondence between sound and meaning.

In the alternative model, there is no objective correspondence between sound and meaning as expressed in the traditional (code model) sense. Rather than having meaning, words and structures have a history of use.¹⁸ The history of use collage catalogues historic uses of various patterns, organizing them into various prototypes. Since no two interlocutors' collages or prototype assemblies will be identical, and since history of use is constantly evolving, the relationship between usage and structure cannot be accurately considered a code.

- Languages (i.e., codes) are systematic, distinctive, and have an existence independent of any given speaker or hearer.

As radical as it may at first sound, under the alternative model, it would be argued that languages, *per se*, do not exist (see Harris 1990:49-50).¹⁹ Similarly, dialects do not exist. Patterned usage is all there is. The individual language users maintain respective history of use collages. The collages maintained by a communicative network may be very similar, but never identical. Furthermore, they are embodied in the user and cannot logically be described as existing independently of the user. The artifacts produced by those users exist independently of the respective histories of use, but the histories of use cannot be disembodied. All speakers have the ability to employ different patterns of usage in different socio-temporal contexts in order to adjust their usage to accommodate, or exclude as the case may be, communicative partners. Hearers may more easily match concepts to their collage when the artifacts observed are created by speakers with similar collages. The linguist may speak of "language x" and the "rules of language x," but only with the understanding that this expression refers to an academic abstraction created by the linguist in order to facilitate discussion.²⁰ In the alternative model, no speaker has ever learned a language. Speakers simply assemble collages of usage patterns, and these collages are in a constant state of evolution.

- Speaker and hearer must share a code in order for successful communication to proceed.

In the alternative view, speaker and hearer only need to be normal, healthy humans in order for successful communication to proceed. Kenneth L. Pike has demonstrated this fact for years with his monolingual demonstration exercise (see Makkai 1993:165-168, Pike 1979).²¹

Expressed in traditional terminology, the alternative model would insist that cross-linguistic communication occurs any time any two people communicate. This is so

between two people who are speaking the same “language” as much as between two people who speak different “languages.” Distinctions are only a matter of degree.²²

- The text conveys meaning.

In contrast, under the alternative model, it would be argued that texts, whether oral or written, do not convey meaning. The notion of conveying meaning suggests that the text somehow *contains* or *carries* meaning. While understood as being metaphorical, the process so described is physically impossible.

Text cannot convey meaning. Rather, texts are created with intention in mind. As such, the text may be used in a “meaningful” way. However, one must be very careful in employing the term “meaning.” In the alternative view, words (dark marks, sound waves) are artifacts. They are used with intention, but are not objectively attached to semantic meaning. In the alternative view, the notion of meaning is supplanted by the idea of history of use.

- The speaker/author of the text encoded a message when he produced the text.

In the alternative view, it would be argued that the speaker did not encode anything. He created an artifact. The text is not an encoding of the author’s thoughts. The idea of a code suggests a one-to-one correspondence between concept and signal. Sometimes humans do think in what may be called words, but thought also includes images, shapes, movements, smells and sounds, textures, emotions and relationships. Humans can experience all of these things, assemble them, rearrange them, and mentally create them. Humans can create such things even when the thing has never before been experienced. Furthermore, the human can discuss these things, even though it is impossible to *match* to concepts to words.

Rather than encoding thoughts, the author *interprets* his own thoughts and *creates an artifact* in response to that interpretation. The text he creates is a *response* to his interpretation. The term “response” is intentionally contrasted to the idea of correspondence, such as the code-model promotes. “Correspondence” and “code” imply a one-to-one relationship. In the alternative view, “language” simply does not involve a one-to-one relationship of meaning and sound.

In contrast to the code model, the alternative model suggests that all communicative media are employed in a similar manner. While media are distinguished for practical exploration and discussion, in theory at least, the model would not segregate kinesics from discourse, or discourse from art or symphony. The alternative view recognizes the unified effect within an artifact of the varied media other theories demarcate as distinct aspects or forms of communication.

- Those receiving the text decode the message when they hear/read the text.

In the alternative view, it would be argued that the hearer interprets the artifact and assembles a concept. (He does not decode a message.) The assembly of the concept is progressive. By ‘progressive’, it is meant that the concept is modified and developed as new interpretation comes in. If at some point the interlocutor considers the developed concept to be incompatible with the newly incoming interpretation, then either the concept or the interpretation must be modified, or the artifact abandoned. Such progressive development is possible because of hermeneutic helixes. Note, however, that the hearer’s helix *does not connect the hearer to the speaker*; the helix only addresses the artifact.

- Communication is successful when the message received is the same as that sent.

In the alternative view, the “message” received is never the same as that “sent.” Communication is *considered* successful when the respective interlocutors are satisfied

with their conceptions. If they have not reached satisfaction, then they may negotiate “meaning” by modifying the artifact on the possibility that the newly shaped artifact will more readily match to recognized history of use patterns. If satisfaction is not attained in what one or the other considers a reasonable span of time, the communicative effort may be discontinued. If the interlocutors are determined, however, then they may continue adjusting and modifying the artifact, in effect creating multiple, related artifacts indefinitely. In so doing, they may find that their history of use collage is adjusted by the collective exposure to the new patterns, giving way to new understanding.

- Communication may be inhibited by noise.

In the code model view, it is generally presumed that noise may be eliminated or factored out, thereby yielding a pure transmission. In the alternative view, what has been called ‘noise’ is not isolated, for noise is a part of context and it is impossible to isolate intentional elements of the artifact from its context. Rather, intention and context are combined within a broad notion of artifact. The artifact does not exist as pure creation or abstraction, but rather, as an alteration of an already existent environment. As such, it cannot be isolated from that environment. The pattern of sound waves which impact the ear drum are not isolated in space into categories of ‘signal’ and ‘noise’ prior to their contact with that organ. Accordingly, it is inappropriate to isolate them so in the model. This is not to deny the existence of “the cocktail party phenomenon,” but rather to accept noise as an essential part of every communicative event.²³

- The speaker and hearer are connected via the channel of communication.

In the alternative view, the speaker and hearer are not connected in any manner whatsoever. Their efforts at communication place them in a communicative network, but that is a social network, not a “linkage” or “connection.” While such terms are understood

to be metaphorical, they have too readily been applied as literal. It is important to understand that the speaker creates an artifact, which then exists autonomously. Similarly, the hearer only has access to the artifact, and not to the speaker. (It should be clear that this sense of "access" is in reference to the speaker's or hearer's mental processes, and not to the physical body.)

- Communication requires intention by the speaker and response by the hearer.

That assertion that the speaker will not intentionally create an artifact without intention to do so is tautological. (A similar tautology may be devised in regard to the hearer.) The tautologies does not, however, address the fact that the speaker may also create an artifact having never intended to do so. Either way, the hearer is left to decide what shall be done with the artifact so created. He may become conscious of its existence and respond to it, or he may miss it entirely. The hearer can only infer as to what is intentional and what is not.

- The linguists' problem lies (primarily) in defining the code and (secondarily) in defining the processes of transmission and reception.

In the alternative view, there is no suggestion that the linguist should focus on one or two areas of interest. Communication is understood to be a complex phenomenon, and any and all aspects of that phenomenon are open to investigation. In this view, it is expected that linguists will investigate areas which were relatively neglected under the code model approach, such as the concerns typically covered under semantics and pragmatics, but it is also expected that linguists will continue to be interested in matters of syntactic structure and grammar, phonology, and phonetics. The alternative view does not change the nature of language and communication; it simply suggests an integrated approach to their study. It is entirely expected that various methods and theories devised under the code model view might be "grafted" onto an alternative view approach,

provided the metatheoretical concepts of those methods and theories could be “adjusted” accordingly.

It is important to understand that the alternative view is *not* an objectivist view. It is, rather, a processual view. That is, it views both language and communication as processes. It is also important to understand that the alternative view is incompatible with the synchronic enterprise as developed by Saussure. This is not to suggest that the alternative view is a diachronic approach; rather, it is to insist that synchronic linguistics was developed under the pressure of a false dilemma (see Harris 1990:47).²⁴ By abandoning the synchronic approach, the discipline of linguistics may liberate itself from anomalies created and supported by the Saussurean paradigm.

5.5 “But that’s not linguistics.”⁵

Some linguists may suggest that the question of communication properly belongs in the domain of semiotics or communication theory, and that it should not be of particular concern to linguists. They claim that language, after all, is the *proper* object of study within linguistics. What is at issue in such responses is, of course, the relationship between language and communication. In regard to this issue, Berge comments: “The phenomena of communication have often been thought of as peripheral in linguistic research. This view is a result of the strong hold the abstract objectivist language conception has had on modern linguistic thought” (1994:618).

From the perspective of revolutionary linguistics, the suggestion that the question of communication falls outside the domain of linguistics seems analogous to suggesting that germ theory properly belongs in the domain of biology or microbiology, and that it should not be of particular concern to practitioners of the medical sciences. Needless to say, a doctor with an inadequate theory of microbial infection would be, at best, an ill

equipped doctor. A linguist with an inadequate theory and model of human communication is similarly ill equipped.

It has already been illustrated that it is an axiom of code model linguistics that “the linguists’ problem lies (primarily) in defining the code and (secondarily) in defining the processes of transmission and reception.” The revolutionary approaches addressed here are not expressions of code model linguistics. Accordingly, it should come as no surprise that they do not conform to code model axioms.

Linguists responding with the statement, “But that’s not linguistics,” are, in effect, issuing a call for orthodoxy, or, that is, attempting to narrowly define orthodoxy so as to exclude the margins.²⁵ As Kuhn notes:

Normal science can proceed without rules only so long as the relevant scientific community accepts without question the particular problem-solutions already achieved. *Rules should therefore become important and the characteristic unconcern about them vanish whenever paradigms or models are felt to be insecure.* That is, moreover, exactly what does occur. (Kuhn 1970:47; italics added)

Of course, disciplinary orthodoxy may only be defined from *within* a paradigm.

John Lyons has written, “To say that language serves as an instrument of communication is to utter a truism. Indeed, it is difficult to imagine any satisfactory definition of the term ‘language’ that did not incorporate some reference to the notion of communication” (1977:32). It may indeed seem that Lyons has hit upon a truism, and it is true that definitions of language necessarily incorporate a reference to communication. It should be noted, however, that the disciplinary perspective regarding the *relationship* of language and communication has not remained constant throughout the history of linguistics. Rather, as paradigms have changed, the perspective regarding the relationship of language and communication has been involved in that change.

As discussed in chapter 3, the linguistic tradition preceding Saussure was defined by the historical-comparative tradition, which contented itself with the evolutionary study of sound change. Linguists presumed a surrogationalist theory of signs, but otherwise they were not particularly concerned with how language was related to communication.

In contrast to the dominant view of his day, Saussure thought it to be misguided for linguists to consider the tracking of sets of cognates through historical tunnels an adequate account of human language. As Harris writes:

The explanations philological historians provided were in the final analysis simply appeals to the past. They did not—and could not—offer any analysis of what a language is from the viewpoint of its current speakers. Whereas for Saussure it was *only* by adopting the user's point of view that a language could be seen to be a coherently organised structure, amenable to scientific study. (Harris 1983:xi)

With his speech circuit model of communication as a foundation, Saussure proposed that linguistics should study the *langue*, assuming that the *langue* was the shared and fixed code which allowed communication to proceed. While it has taken various forms, that general view has held the attention of the discipline of linguistics since the decade following publication of Saussure's *Cours*.

Recent years have seen the perspective regarding the relationship of language and communication again called into question. Saussure considered the historical-comparative tradition to be misguided. Many linguists of the present day think it to be similarly misguided for the discipline to consider descriptions of the "code" of ideal speaker-listeners in a completely homogenous speech community an adequate account of human language. Please understand that this comment is not directed toward the generative school alone. While Chomsky coined this phrase "ideal speaker-listener," he was indeed correct in stating that this view toward such ideals has "been the position of the founders of modern general linguistics." That position is, after all, the effect of Saussure's

proposals regarding the *langue*. But whereas Chomsky could write that he saw “no cogent reason for modifying” that approach (1965:3, 4), many contemporary linguists see ample reason for its modification.

Devlin discusses the move toward a modified (or alternative) approach to linguistics and communication in his book *Goodbye Descartes* (1997). Having discussed the advent of sociolinguistics, psycholinguistics, and increasing interest in the process of communication as opposed to formal elements of language, Devlin writes:

Whereas Chomsky had concentrated on what might be called the *internal mechanics* of language, the new linguists viewed language as just one of many ways in which two people can communicate. Using language to communicate requires much more than having a mastery of the syntactical rules of a given language, these new researchers argued. Accordingly, the focus should be widened from language itself to the much more general notion of language as a component of a communication process. (Devlin 1997:186)

Devlin continues, predicting an increasing disciplinary shift not simply toward study of language in context,²⁶ but rather toward the study of *communication using language*:

So from now on, as we examine our language ability, the emphasis will be very much on communication using language, as opposed to a de Saussure- or Chomsky-style study of the structure of language taken out of context. The developments we will follow are part of an emerging new science of communication. This new science is presenting many new challenges, as well as revelations, into what our minds are doing as we reason and use languages. (Devlin 1997:186)

5.6 The code model in the future of linguistics

The question of whether or not the code model *should* have a place in the future of linguistics is distinct from the question of whether the model *will* have a place in that future. The question of whether it will have a future must be addressed first. In answering that question, it is helpful to consider the three constituent models individually, for the

apparent plausibility they command contributes to the apparent plausibility of the code model as a whole.

The oldest of the three constituents, the conduit metaphor, has displayed a tremendous longevity. It is already hundreds, if not thousands of years old, and at present there is no indication that its continued use is threatened. This does not mean, however, that anyone has *ever* literally packaged a nugget of meaning into a word, or literally joined two brains via a pipe or wire. Nevertheless, one should expect that common language will continue to employ the metaphor. By extension, the "common sense" view of communication will likely continue to employ the conduit metaphor.²⁷

A similar vitality is expected for the information theoretic constituent, albeit for different reasons. Information theory continues to display a strong and productive existence in electrical engineering and related fields, including computational engineering and neurology. Since the technical uses of information theory in these fields are independent of its appropriation in the code model, one would expect that, even if the code model were to be abandoned, the information theoretic account could remain vital in the engineering concerns. Linguists should understand here that where linguistics is concerned with the actual transmission and reception of articulated sound waves, it is dealing with an engineering issue. In that regard, information theory will continue to be effective in linguistics as well, but that application should be distinct from the use of the code model.

Within linguistics, the vitality of the code model largely depends upon the perceived vitality of Saussure's speech circuit more so than it does the vitality of Shannon's information theoretic model or the conduit metaphor. If linguists abandon the Saussurean paradigm in favor of another, then one might reasonably expect that the speech circuit will be abandoned in the process. When that happens, ultimately, the code model will follow. Exactly what model will take its place is yet to be determined.

One must remember, as well, the various academic contexts in which the code model is employed. The model is not simply the property of linguistics; other disciplines in the humanities and human sciences also employ the model (e.g., English literature, Kinneavy 1971:17-40; anthropology, Spradley and McCurdy 1980:11-13). Roughly characterized, any discipline which has at sometime been strongly influenced by Saussurean structuralism is likely to demonstrate (or to have demonstrated) an affinity for the code model of communication.

Considering the breadth of diffusion which the code model account has seen, the model is likely to remain in use for some time, even though it has been shown to be an inaccurate and misleading account of human communication via natural language. But as long as the discipline of linguistics continues to employ the model and the body of presuppositions which it typically embodies, the discipline will continue to struggle with the inconsistencies and anomalies it supports.

5.7 The code model and alternative model in social context

The models of communication addressed in this study obviously exist in disciplinary environments. They also exist in a broader social environment. The linguists who have worked with these models undoubtedly brought their broader experience and perspective to their work. Harris discusses the role of such context on Saussure's development of the speech circuit model of communication. Having noted certain inherent weaknesses in Saussure's model, Harris comments:

That [an attempt to promote the model] was [made], however, bears witness to the extent to which the plausibility of this general picture of speech-communication is indebted to the cultural paradigms of a particular phase in Western civilization. Whether it would appear at all convincing if seen against a totally different cultural background must be doubtful. Its persuasiveness derives essentially from the fact that, at a particular time and place in human history, all the relevant analogues and justifications—metalinguistic, philosophical, technological and political—came together to provide what could

be seen in that context as a necessary and sufficient conceptual framework for the analysis of speech. (Harris 1987:218)

Contemporary practitioners of the Saussurean paradigm have, of course, integrated Saussure's speech circuit with the information theoretic model proposed by Shannon. This event is also an expression of broader context; the code model of communication was developed in the academic context shaped by Cybernetics, information theory, and a growing interest in machine translation. The mathematical and engineering analogies so evoked had an obvious effect. One may question, for example, whether Chomsky's mathematical account of language would have been accepted in a different social context.

What, one may ask, are the cultural paradigms of *contemporary* Western civilization which would give rise to revolutionary linguistics and an alternative model of communication such as that presented in this study? As a broadly embraced cultural paradigm, *poststructuralism* may greatly influence the perceived mortality of the code model and the potential validity of an alternative model.²⁸ Together, such perceptions may precipitate the completion of this paradigmatic life-cycle and hasten the onset of another. But as Joseph notes: "Within linguistics, the effects of poststructuralist thought are only beginning to be felt; the field in which structuralism began is the last to let it go" (1994:3669).

CHAPTER VI

SUMMARY AND CONCLUDING COMMENTS

This chapter provides a brief summary of chapters 1 through 5, as well as concluding comments for the study as a whole. The concluding comments are presented in conjunction with the summary material for respective chapters.

6.1 Chapter I

As Roy Harris has stated:

Every linguistic theory presupposes a theory of communication However minimal or inexplicitly formulated such a theory of communication may be, it has an essential role to play because nothing else can provide the conceptual underpinnings necessary for a more detailed account of how an interactive social activity like language works. (Harris 1987:204)

This study has provided a detailed analysis of a particular model of communication which has been employed in linguistics for nearly fifty years. The model in question has been called the "Code Model of Communication." It is a basic model of communication and expresses the idea that communication is the transmission and reception of information between a human source (encoder) and receiver (decoder) using a signaling system. Of this model Edmondson and Burquest (1998:95-96) comment that in that view "language is a kind of code, and communicating is the process of encoding concepts and its inverse decoding. The notion is quite familiar and so intuitive that the question may be asked whether there is any conceivable alternative to it." This study has asserted that the code model concept of communication has been fundamental to the *metatheory* of contemporary linguistics (see Crystal 1997:72).

6.2 Chapter II

The second chapter of the study has addressed the fact that models are metaphors. Within linguistics, as within any discipline, models play an important role in metatheory. Metatheory, defined as “the underlying beliefs which generate a particular approach” and as “ideology or theoretical presupposition” (Figueroa 1994:4), is typically assumed within a given discipline, and therefore rarely discussed. Metatheory can be examined vicariously, however, through examination of the metaphors employed by linguists. As Lakoff and Johnson suggest in regard to their own study of metaphor, “language is an important source of evidence for what the [conceptual] system is like” (1980:3).

In examining the language used by linguists, one finds a recurring theme reflected in use of a particular theoretical model, the code model of communication. As a means of documenting this recurring theme, the study presented a selection of quotations spanning nearly fifty years of linguistic literature. One need not look far to determine that, indeed, most linguists employ some version of the code model, even though they may vary in regard to the details of its conceptualization and application.

As suggested by Burke (1984, [orig. 1954]) and Lakoff and Johnson (1980), metaphors serve to shape perspective and experience. This is particularly true of conceptual metaphors (see again figure 2.1.). As presented in chapter 2, the code model of communication is a conceptual metaphor which shapes the conceptual framework of most traditional linguists. As such, the code model is, indeed, a powerful metaphor within linguistic metatheory.

6.3 Chapter III

While a few linguists have made reference to the code model and its role within linguistics (Berge 1994, Harris 1981:10-13, Harris 1987:205-208, Harris 1990, Schiffrin 1994:391-393, Sperber and Wilson 1986:2-6ff), that literature has not provided a detailed

analysis of the model itself. Chapter 3 addressed the historical development of the code model and its composition via the integration of three constituent models: the conduit metaphor, Saussure's speech circuit model, and Shannon's information theoretic model of communication. The chapter provided a detailed discussion of each of the three constituent models. The conduit metaphor, first noticed and cited by Reddy (1979), is an ancient metaphor used universally by speakers of English in common speech about communication. It suggests that meaning can be sent from one speaker to another as via a conduit. Together with an auxiliary metaphor, the container metaphor, which suggests that words can contain meaning, the conduit metaphor is firmly entrenched in common speech. The status of the metaphor in English metalanguage, together with the frequency in which it is used, make the model intuitively satisfying. The conduit metaphor is a key component in the code model of communication, providing subconscious motivation and apparent plausibility for the model.

The second constituent model of the code model of communication is the Saussurean speech circuit model (see again figures 3.3 and 3.4). The chapter provided background information as to how Saussure developed the model, including analysis of how the model relates to the work of British philosopher John Locke. The discussion also discussed the relationship of Saussure's model to the academic atmosphere of his day. Briefly stated, Saussure's speech circuit model described speech (that is, communication) as a circulating loop or circuit, wherein speaker and hearer employed a fixed system of signs linking concepts and acoustic images. This model is an expression of key concepts developed in Saussurean notion of synchronic linguistics, and in structuralism generally.

By separating *langue* (knowledge of a given language shared by all members of a speech community) from *parole* (speech production), Saussure established a fixed,

abstract object of study for linguists. In doing so, he satisfied presuppositions of the academic community regarding the requirements of a science. As Joseph writes:

Since modern science is predicated upon the elimination of the will from any object of inquiry, human desire, action and creation came to be excluded from the 'scientific' study of language. This has necessitated a considerable abstraction of language away from its role in human affairs, treating it as if it existed independently of speakers and speech acts. (1994:3665)

In addition, the fact that Saussure cast his model of communication in electromechanical terms appealed to a community enamored with the newly popular telephone and electromechanical communication generally, thereby helping to insure that synchronic linguistics would join the ranks of modern sciences.

Saussure's use of electromechanical terms also contributed to the ease with which the speech circuit model was later integrated with Claude Shannon's information theoretic model (see again figure 3.6). The information theoretic model is the third constituent model from which the code model of communication is composed. As Shannon (1948) originally described it, the model was simply a schematic diagram and introductory discussion of the mechanics of accurately transmitting and receiving a signal. The model was presented in the context of a statistical theory for measuring the accuracy of transmission and reception processes.

In 1949 Warren Weaver published a review of Shannon's theory, making suggestions for how the model and theory could be expanded for application to human communication. Later in that same year, Shannon's original paper was republished in conjunction with a revision of Weaver's (1949a) review (Shannon and Weaver 1949). Coupled with Weaver's review, the information theoretic model quickly spread into the fields of psychology, semiotics and linguistics. Within linguistics, Shannon's model seemed to fit readily into the already existing Saussurean tradition. Shannon's model was

soon integrated with Saussure's speech circuit model and the age-old conduit metaphor, forming what is referred to in the present study as the code model of communication.

The analysis in this study of Shannon's theory and of the process of integration with the other two constituent models has shown, however, that what was borrowed was actually a misrepresentation of Shannon's theory and model. The information theoretic model was never designed to be able to account for human communication. Nevertheless, the linguistic community of the mid-twentieth century was ready for a "scientific" description of communication and a mathematical model that could account for it. Factors were right for the adoption of the code model of communication, which soon came to embody an entire set of presuppositions within linguistic metatheory.

Chapter 3 also discussed code model presuppositions, expressed as axioms within linguistic theory. Each axiom is documented through a variety of quotations, demonstrating that the axioms are held by linguists from a variety of schools. Common adherence to these axioms suggests that these linguists are unified in common reliance upon code model-based metatheory.

6.4 Chapter IV

Chapter 4 discussed how unification around a common linguistic metatheory suggests adherence to a common disciplinary paradigm. From the perspective of several linguists, however, the discipline has not displayed such unification. These linguists have expressed dissatisfaction with Thomas Kuhn's paradigm theory, wherein he states that sciences are usually centered on a dominant paradigm. The insistence of these linguists that linguistics has not displayed such a characteristic allegiance to a paradigm presented a conflict with Kuhn's account of disciplinary science. Had these theoreticians agreed with Kuhn, they would have found themselves suggesting that linguistics is not a science, or,

that it is at best an immature science. These issues played a significant role in their rejection of Kuhn's theory.

While properly aware of certain plurality in linguistic traditions, the theoreticians addressed did not adequately identify the nature of shared metatheory embraced by various schools of thought in linguistics. Accordingly, they did not adequately identify the shared tradition and shared metatheory as an expression of a shared paradigm. That shared tradition may be called *linguistic structuralism*. In order to distinguish that broad tradition from the lesser tradition of the structuralist school, linguistic structuralism may be called the *Saussurean paradigm*. Overlooking the influence of the Saussurean paradigm constitutes an error. Not only does this error affect understanding of the history of the discipline, but it also contributes to a continuing naiveté regarding the shared metatheory driving that paradigm. The discipline has not held an inconsistent paradigm, as has been suggested (McCawley 1979); rather, the paradigm simply did not supply all the details or rules of engagement, leaving the subcommunities certain freedom to approach those details in various ways.

The academic environment thus created within linguistics supports a certain level of rivalry for dominance, but within normal science that rivalry is *sibling* rivalry. The various "children" of the Saussurean paradigm vie for position, with each arguing that its approach is the better representative of the underlying, well-established metatheory. These sibling theories may focus on different problem areas, thereby resulting in specialization and differentiation among themselves. But they continue to depend upon a shared metatheory; in this way they maintain a family resemblance.

But what of the schools of thought which do not bear that family resemblance? Do these represent a move toward revolutionary science—that is, "revolutionary" in Kuhn's sense of the word? As has been discussed, the last few decades have seen a considerable

development of literature with strong counter-arguments directed not simply at the lower level issues or details added to the paradigmatic models, but at the very *basis* of the dominant paradigm. Such theoreticians are not arguing with siblings over who will be the favorite child, or cynosure as Hymes terms it (1974a). They are questioning the paradigmatic models upon which the discipline depends.

As McCawley correctly notes, however, it is impossible to determine whether or not such revolutionary science will lead to disciplinary revolution. He writes:

When a subcommunity develops within an existing scientific community, it is impossible to determine whether that subcommunity forms the vanguard of a scientific revolution. In its early stages, a subcommunity will have only a fragmentary paradigm, and its members will have extended more credit to that paradigm than its credit rating really warrants; their membership in the subcommunity will to a certain extent represent a speculative investment of their intellectual capital. The subcommunity's paradigm may become more highly articulated and may provide solutions to important problems, and the auxiliary hypotheses needed to pay its debts may be developed, so that its credit rating improves and it attracts investment of a less speculative character, possibly culminating in its paradigm becoming the paradigm of the larger scientific community. The subcommunity's paradigm may, however, just go deeper into intellectual debt without ever developing beyond mere fragments, and it may lose all power to attract additional investment. If the investors are rational and well informed (of course they won't all be), a subcommunity's paradigm will become that of the larger community only if it has shown itself over a period of several years to be a worthwhile investment. (McCawley 1979:232; italics added)

How does one evaluate the risk or potential return for an investment of intellectual capital? If it were somehow possible to create a theory-neutral environment wherein conflicting paradigms might be compared—an environment devoid of social, psychological, and emotional variables and influences—scientific debate might be relatively brief. The arguments would be a simple matter of logical or mathematical proof, or of identifying the perspectives required to support each paradigm. But as Kuhn suggests, when dealing with theory-choice (i.e., practitioners' commitments to a paradigm), debate is not simple:

Debates over theory-choice cannot be cast in a form that fully resembles logical or mathematical proof. In the latter, premises and rules of inference are stipulated from the start. If there is disagreement about conclusions, the parties to the ensuing debate can retrace their steps one by one, checking each against prior stipulation. At the end of that process one or the other must concede that he has made a mistake, violated a previously accepted rule. After that concession he has no recourse, and his opponent's proof is then compelling. Only if the two discover that they differ about the meaning or application of stipulated rules, that their prior agreement provides no sufficient basis for proof, does the debate continue in the form it inevitably takes during scientific revolutions. *That debate is about premises, and its recourse is to persuasion as a prelude to the possibility of proof.* (Kuhn 1996:199; italics added.)

Paradigms don't hold premises; scientists do. In speaking of scientists as working within a paradigm, one is addressing, in part, the fact that those scientists share, more or less, a set of premises, or as described in chapter 3, metatheoretical conceptual axioms.

In addressing linguistic metatheory, this study has explored axioms concerning the relationship of language and communication. Linguists of the Saussurean paradigm have rarely felt the need to make these underlying premises explicit. There seemed no need to do so; it was a rare occurrence when a colleague failed to agree with the unstated, yet dominant position on communication. But this situation is changing. The question of communication constitutes a precipice upon which the discipline of linguistics is perched.

6.5 Chapter V

Chapter 5 supplied a critique of the code model, discussing anomalies supported by the model and by the Saussurean paradigm generally. The code model was explained in the context of abstract objectivism and the synchronic approach, neither of which are essential perspectives. Following the critique, the discussion briefly reviewed several other models which appear in the literature. The chapter then returned to the issue of conceptual metaphor (see again chapter 2), introducing an alternative metaphor as an antithesis to code model thinking. As a means of comparison, the model was reviewed along an outline of code model axioms.

Lest some readers gather from this analysis a sense of need to somehow purge such metaphors from linguistic metatheory, it should be reiterated that the use of such metaphors is not optional. As C. S. Lewis writes:

It is a serious mistake to think that a metaphor is an optional thing which poets and orators may put into their work as a decoration and plain speakers can do without. The truth is that if we are going to talk at all about things which are not perceived by the senses, we are forced to use language metaphorically. Books on psychology or economics or politics [or linguistics] are as continuously metaphorical as books of poetry or devotion. There is no other way of talking, as every philologist is aware all speech about supersensibles is, and must be, metaphorical in the highest degree. (Lewis 1947:88)¹

Rather than take from this analysis a desire to somehow purify linguistics, rendering instead some plain language based upon pure logic (as if logic were not also metaphorical—see Lakoff and Johnson 1999:170ff), the linguist is better off simply understanding the gravity of the metaphors employed. This is important for linguistics, perhaps even more so than other disciplines, since, as Weinreich suggests, “language is its own metalanguage” (Reddy 1979:286).

It would be naive to suggest that linguistic metatheory should or even could avoid the use of conceptual metaphors. Nevertheless, a study of such metaphors gives the analyst ability to momentarily distance himself from their seductive pull. As quoted previously, Shibles suggests:

A knowledge of metaphor allows us to see what it is possible to say and how to say it. It also helps us avoid being captivated by our metaphors which we unconsciously thought were literal truths. (Shibles 1971:3)

Perhaps through exploring such metaphors, the linguistic community may begin to overcome the tendency toward reification of abstractions so often inherent in paradigm communities.

NOTES

Chapter 1

1. The neologism seems to have originated with Sperber and Wilson (1986:2).
2. In an interview with Horgan, Kuhn recounted his continued disappointment when one or another young theoretician would contact him asking for help in starting a revolution. Horgan writes:

Kuhn was also upset that he had become the patron saint of all would-be scientific revolutionaries. "I get a lot of letters saying, 'I've just read your book, and it's transformed my life. I'm trying to start a revolution. Please help me.'" (Horgan 1996:45)
3. It is important here to distinguish the notion of metatheoretical conceptual axioms from the more common notion of presuppositions. In conducting a study of historical literature, it is nearly impossible for the researcher to examine presuppositions, for presuppositions typically go unstated. However, the literature does display, by collective weight of repetition, statements which are universally accepted as true. These are better described as axioms.
4. Readers may note that Figueroa (1994) also builds upon Andresen, although taking a different direction in her study.
5. "Exemplar" is here used in the sense of an "ideal model."

Chapter 2

1. The definition offered by Brook-Rose is much too broad to serve many contemporary authors addressing the topic of metaphor. For instance, her definition would also include paraphrase and metonymy, without isolating qualities peculiar to these types of expression. Readers interesting in additional reading on metaphor will also want to see Shibles (1971) and Ortony (1979), in addition to Burke (1984 [orig. 1954]) and Lakoff and Johnson (1980, 1999). While Shibles' book obviously won't provide coverage of more recent literature, it does provide an important annotated bibliography on metaphor.
2. Burke (1954) has been republished in second and third editions (3rd edition 1984). Burke's material quoted in this study is the same in each edition. The 1954 edition is quoted here in order to highlight the chronological development of theory regarding the role of metaphor in structuring conceptual organization.
3. While Reddy (1979) does not employ the term conceptual metaphor in addressing the conduit metaphor, a classic conceptual metaphor of communication, he does suggest, via use, the term metaphorism.

4. Readers should also see Norman (1993) and Young (1993), both of which discuss mental models, especially Young (1993:38) discussing *strong analogy* and *surrogate* mental models. In some respects, the code model of communication conforms to the characterization of mental models. Norman writes:

Mental models are naturally evolving models. That is, through interaction with a target system, people formulate mental models of that system. These models need not be technically accurate (and usually are not), but they must be functional. A person, through interaction with the system, will continue to modify the mental model in order to get a workable result. Mental models will be constrained by such things as the user's technical background, previous experience with similar systems, and the structure of the human information processing system. (Norman 1993:7-8)

5. As the briefest of examples, consider the matter of proof reading one's own writing. Invariably, the reader finds it difficult to "catch" all errors, especially those of a typographical nature. But a second reader can often identify such errors quickly. It would be foolish to suggest that the two readers experienced differing *stimuli*, but they obviously do experience different perceptions. The expectations born by the writer clearly affect his perceptions. While the second reader may be similarly affected by expectations, those expectations may not directly overlap with those of the author. Accordingly, he is not predisposed to the same perceptions as the author.

6. The phrase "trained incapacities" has been attributed to both Veblen (see Burke 1984:91) and Paul Feyerabend (Victor Vitanza 1995, personal communication).

7. Compare Hockett's account of the decoding process to Liberman's motor theory account of speech perception (see Liberman 1996, Crystal 1997:251).

8. While they employ the model in a linguistic context and in a manner consistent with linguistics, it should be mentioned that Denes and Pinson, while working in experimental phonetics, both hold degrees in engineering.

9. Unfortunately, Nida does not accurately represent all elements of Shannon's theory. For example, in discussing the information theoretic notion of information, he states, "Information' is not, therefore to be equated with meaning, but to be understood as the *dynamic impact of a word*—the extent to which it stands out in the discourse because of its individuality and distinctiveness" (Nida 1990:86; italics added). See section 3.2.3.1.1 for a discussion of the term information and its use within information theory.

10. It should be noted that, in contrast to many linguists employing the code model, Halliday is very interested in the importance of context. He writes:

Now one important fact about speaking and understanding language is that it always takes place in a context. We do not simply 'know' our mother tongue as an abstract system of vocal signals, or as if it was some sort of grammar book with a dictionary attached. We know it in the sense of knowing how to use it; we know how to communicate with other people, how to choose forms of language that are appropriate to the type of situation we find ourselves in, and

so on. All this can be expressed as a form of knowledge: we know how to behave linguistically. (Halliday 1978:13)

11. Fleming does use the phrase "inferred message" in writing of the decoding process, recognizing that the receiver's message may not be equivalent to the transmitter's message.

12. In a pilot survey with thirty-six responses, one was simply Saussurean, eight were simply conduit metaphorisms, and eighteen employed the code model (including information theoretic terminology). Nine made appeals to various other models or accounts.

13. One respondent cited Van Dyke, but provided no date.

14. While Sternberg's specific concern is with the psychological stress induced by reification of socially created abstractions (the ominous doctoral dissertation in particular), rather than with the reification of models, his comments shed light on the general phenomenon as a psychological process.

Chapter 3

1. Of course, this is not to suggest that *parallel invention* does not or cannot occur. It is simply to suggest that, in observing instances where multiple communities employ an identical or closely similar artifact (tool, clothing style, or, in this case, theoretical model of communication), the diffusionist view will initially hypothesize adoption, rather than parallel invention.

2. Flesh's (1951:34) table is as follows:

| | |
|---------------|----------|
| Zero | ca. 500 |
| Romantic Love | ca. 1150 |
| Chair | ca. 1490 |
| Corporation | 1553 |
| Sovereignty | 1576 |
| Opera | 1600 |
| Novel | 1678 |
| Progress | 1683 |
| Success | 1684 |
| Gravity | 1687 |

3. Section 2.4 documents Nida's expanded model, which is clearly an appeal to the code model. Nida's simplified model also makes such an appeal, although less complete. His terms source, message, and receptor are reminiscent of Weaver's discussion of information theory (Weaver 1949b), as is discussed in section 3.2.3.2.

4. For example, Saussure first offers a strong view of arbitrariness, but later seems to back off from that strong position, adding the concept of 'relative arbitrariness' (for commentary on such issues, see Joseph 1994:3667).

5. For English language literature addressing Saussure's *Cours*, see, in particular, the English translation by Harris (Saussure 1983), as well as the commentaries by Culler (1986) and Harris (1987).

6. Synchronic linguistics was developed during teaching in general linguistics and is detailed in the subsequent publication of *Cours*. While the framework for structuralism is spelled out in *Cours*, Saussure himself never even used the term (Harris and Taylor 1997:211). Structuralism was developed more through the work of Saussure's readers than through his direct influence.

7. See Harris (1980:44f) for a general discussion of surrogationalism in Western thought.

8. French editions of *Cours* have maintained the same pagination since the 1922 edition. In order to cross reference that pagination, the English translation quoted in this study (Saussure 1983) indicates the page breaks and page numbers of the 1922 French edition in the margins, identifying them with square brackets. Harris's (1987) commentary references those bracketed page numbers, rather than the actual pages of the English translation. In an effort to provide consistency and ease of cross referencing, this study follows Harris's convention.

9. A physical analogy for *langue* exists in a form of sculpture sometimes called tension-grid. This form of sculpture involves the suspension of numerous rods from elastic bands. The ends of several bands are attached to the ends of each rod, with the rods being attached to each other via the bands. The tension of the bands equalizes so that the rods are suspended, causing the sculpture to assume a particular three-dimensional shape. Pressure may be applied to one or another of the rods, causing the shape to change, but once the pressure is removed, the bands resume equilibrium, so that the sculpture resumes its shape. If one of the bands is cut, however, the shape of the sculpture changes permanently, for the original equilibrium has been disrupted and a new equilibrium must be attained. Several children's toys have been marketed which employ this type of sculptural construction. (One version of this toy is marketed under the name "tensegritoy.")

10. Harris addresses the issue of editorial misinterpretation in his translator's introduction to Saussure 1983:

When Saussure died in 1913, he left no manuscript setting out his theories in detail. What was published three years later as the *Cours de linguistique générale* was put together by his colleagues, mainly from lecture notes taken by his pupils. The notes in question have now—belatedly—been published in full by R. Engler in his critical edition of the text (1967-74). On the evidence of this material, it has sometimes been suggested that by no means all the ideas in the *Cours de linguistique générale* are [*sic*] a faithful reflexion of Saussure's.

Understandably, a great deal of the blame has been laid at the door of Saussure's editors. What is beyond dispute is that they subsequently admitted to having failed to represent Saussure's view of the phoneme correctly. What is also beyond dispute is that since the publication of the original material on

which their text was based, and the detailed analysis of this material by Saussurean scholars, there is ample scope for doubt or scepticism on a variety of points. Indeed, it seems clear that in certain instances the editorial treatment of the original notes, far from clarifying what Saussure said, introduces an element of uncertainty as to the correct interpretation. Even the much-quoted final sentence of the *Cours* turns out to be an editorial pronouncement for which there is no specific textual authority in the manuscripts. (Harris 1983:xii)

11. For a discussion of the distinctions between Locke's substance and Descartes' notion of the "*cogito*" and "wax," see Scott-Kakures, et al. (1993:176).

12. J. H. Hexter writes of this methodological flaw in historical studies, describing it as a tunneling phenomenon, writing that certain historians "split the past into a series of tunnels, each continuous from the remote past to the present, but practically self-contained at every point and sealed off from contact with or contamination by anything that was going on in any other tunnel" (Hexter 1961:194, also see Rutman 1970).

13. The qualities are spoken of as being active here, because in the corpuscularian ontology the corpuscles were thought to impact the senses, rather than the senses being activated by the human agent.

14. Within his lifetime Saussure was most famous for a landmark philological treatise he published at the age of 21, entitled *Mémoire sur le système primitif des voyelles dans les langues indo-européennes* (Dissertation upon the original vowel system of the Indo-European languages.) (see Saussure 1983:[8], Harris 1983:xvii, n. 1)

15. Leonard Bloomfield's affinity for Saussure varied through his career. For example, in 1923 Bloomfield published a review of *Cours*, praising Saussure's innovative focus on the general aspects of human speech, particularly in an academic context which was consumed with study of the history of Indo-European languages. By the 1935 publication of Bloomfield's *Language*, however, he had changed his position regarding Saussure, giving him only brief mention (Bloomfield 1935:19). Harris rightly notes that the difference between the two views lies in the pre-behaviorist versus behaviorist periods of Bloomfield's career (Harris 1987:xii-xiv). The pre-behaviorist Bloomfield, "in effect, acknowledges Saussure as the founder of modern general linguistics, even though Bloomfield's earlier book *An Introduction to the Study of Language* had come out in 1914, thus preceding the original publication of *Cours* by two years" (Harris 1987:xii-xiii). In contrast, the behaviorist Bloomfield opposed the remnant of psychologism he regarded in *Cours*. As Harris notes, "That later Bloomfieldian reading was to dictate the relationship between American and European versions of structuralism for the next quarter of a century" (1987:xiii). Again referencing de Mauro (1972:371), Harris comments, "It would be a mistake to infer from the way in which Bloomfield's *Language* deliberately ignores Saussure that Saussurean ideas left no trace in American academic linguistics of the interwar period. Bloomfield himself admitted to Jakobson that reading the *Cours* was one of the events which had most influenced him" (Harris 1987:xiii-xiv). Similarly, Joseph notes a 1945 letter in which Bloomfield "described his major work *Language* as showing Saussure's influence 'on every page'" (Joseph 1994:3669).

16. It may be difficult for readers unfamiliar with Shannon to grasp the breadth of Shannon's influence. Rogers writes:

The Shannon-Weaver book [1949] is one of the most widely selling academic books published by a university press. About 45,300 copies were sold from 1949 to 1990, and the rate of sales continued at more than 600 per year in the 1980s (Stockanes 1990). ... Claude Shannon's theory, first published forty-five years ago, continues to be regarded as important by contemporary scholars. (Rogers 1994:425-426)

17. As shall be discussed, Shannon's original (1948) paper was preprinted in Shannon and Weaver (1949), which in turn was published as a reprint in 1978. Unfortunately, the reprint reversed the order of the two articles by Shannon and Weaver, which makes page referencing somewhat difficult. The present review cites the first edition.

18. The respective sections of Shannon and Weaver (1949) are cited here as Shannon (1949) and Weaver (1949b).

19. "XXXOOO" is sometimes used to represent "Hugs and Kisses."

20. As will be discussed in section 3.3.2, semantic pathology results "whenever two or more incompatible senses capable of figuring meaningfully in the same context develop around the same name" (Ullman 1957:122; Reddy 1979).

21. It should be noted that having multiple points of entry may have contributed to reification of Shannon's model of communication within linguistics. The point is that with *several* major theoreticians eagerly supporting the model, and doing so independently, the concerns of any skeptics were easily overpowered by the positive support.

22. In his study on the diffusion of information theory, Dahling (1962:130) maps several early exchanges of the theory as they appeared in various literature. Unfortunately, some of Dahling's citations numerically cross-reference an unpublished bibliography assembled by the Stanford University department of communication studies, rather than providing full bibliographic information. Of course this limits the usefulness of Dahling's publication, particularly since it seems that Stanford's department of communication studies no longer maintains a copy of that bibliography (Donald Roberts 1999, personal communication).

23. It is interesting to note that Shannon was a colleague of Wiener's and acknowledges him in the 1948 paper and 1949 book (Shannon 1949:81). Weaver also notes Wiener's influence (Weaver 1949:95, n. 1). Wiener similarly acknowledges Shannon in his own writings.

24. Dahling (1962:130) also mentions several other early articles which were similarly overlooked. Unfortunately, the bibliographic information for these others is lost. (See again note 22 of the present chapter.)

25. Readers interested in researching Hockett's citation of his (1951) article in *Language* 27 will find the cited material to be less than helpful. It is possible that the

citation in Hockett (1953) involves a misprint. Nevertheless, that citation is correctly quoted in the present study.

26. Reddy (1979:305) also mentions this quotation, referencing Shannon and Weaver (1949:7), although from a different edition than that quoted in this study.

27. Within the thick line enclosures of figure 3.7, the networks of associations are myriad and complex and therefore would be impractical to represent through wire diagrams.

28. For convenience, the assemblage of acoustic signals passed between the communicative partners is referred to as a text. Crystal defines text as "a pre-theoretical term used in linguistics and phonetics to refer to a stretch of language recorded for the purpose of analysis and description. ... texts may refer to collections of written *or* spoken material" (1997:386).

29. The verb "defining" is used here simply for conciseness and convenience. The sense intended is primarily "to determine the limits or natures of; describe exactly" (Neufeldt 1989:115).

30. What, then, about tongue twisters? The fact that the human articulatory device is capable of pronouncing tongue twisters correctly when they are articulated slowly demonstrates that the problem with fast speech tongue twisters is not with the message alphabet, but with: (1) the coordinated movement of articulatory organs, and sometimes with (2) the brain supplying the instructions to the transmission device. A similar problem arises in fast typing, particularly on an older model manual typewriter. Sometimes miss-typing occurs when the keys lock up because the machine is not designed to handle the typist's speed. Other times miss-typing occurs when the typist's fingers supply the wrong "word" or strike keys out of turn.

31. The word [a'klokšt^hp^htš^hk^h] is from the Chinook language spoken by an indigenous group in Canada. The word is said to mean "she carries it up from the beach" (Floyd 1981:76).

32. To the extent that Weaver incorporated conduit metaphorisms into his discussion of information (Weaver 1949a, 1949b), this caveat should also be applied to Weaver's account of communication.

Chapter 4

1. While principles are derivative, presuppositions are *a priori*.

2. For convenience, parenthetical references to Kuhn in this study will refer to the 1996 edition. Readers will find that references and quotations are easily cross-referenced to the 1962 and 1970 texts. Where relevant or needed for clarification, material from the Postscript section is identified accordingly.

3. Kuhn employed metonymy in extending the term paradigm, which originally referred to the concrete shared examples and problem solutions of a discipline, to more abstract notions, such as theory, metatheory, and so forth.

4. One may ask if, by “conversely,” Kuhn intends “as a consequence.” While that would be reasonable, it seems that here Kuhn is simply suggesting that the ‘models component’ is a “two-sided coin.” One side determines what will be accepted as explanation and solution, while the other defines the puzzles and their importance.

5. As Kuhn suggests, the values component includes the notions of plausibility held by a particular community. In discussing the issue of plausibility in phonological analysis, Burquest and Payne offer an interesting comment which alludes to the tacit and communal quality of such values:

The importance of phonetic plausibility in the explanation of complementary distribution cannot be overemphasized. Unfortunately, phonologists have not yet come to universal agreement as to the details of what constitutes phonetic plausibility; but there is widespread agreement on the [following] principle: If it is claimed that two sounds are manifestations of the same phonological unit, it is the analyst's job to demonstrate that the differences between the two sounds can be attributed to the different environments in which they occur. (Burquest and Payne 1993:24; italics added)

6. Tacit: “not expressed openly, but implied” (Neufeldt 1989).

7. Readers should note that this quotation is from the 1962 section of *Structure*, in which Kuhn also used the term paradigm in referring to what he later (1970) identified as the disciplinary matrix.

8. Caution is warranted here, for it appears that Kuhn is contradicting himself, suggesting that in such a situation paradigms *are* commensurable. Kuhn has not suggested that the practitioners may never consider alternative paradigms. Rather, he is pointing out that there is seldom, if ever, a *neutral position* from which one may make such comparisons.

9. In the foreword to Hoyningen-Huene (1993:xii-xiii), Kuhn comments on the *individual* nature of *group* gestalt switch, stating: “Groups do not have experiences except insofar as all their members do” (Kuhn 1993:xiii).

10. *Incommensurable*: “not commensurable: ... lacking a basis of comparison in respect to a quality normally subject to comparison” (Mish 1983). *Commensurable*: “having a common measure: ... divisible by a common unit an integral number of times” (Mish 1983).

11. Borradori (1994) is an introduction to various philosophers. Chapter nine includes an interview with Kuhn.

12. Whereas an arboreal structure involves a major trunk with limbs, a rhizomatic structure involves a running stem, from which various fairly autonomous structures develop. A rhizome is “a horizontal stem on or under soil, bearing leaves near its tips and roots from its undersurface” (Neufeldt 1989).

13. This issue will be illustrated below in regard to the relationship of various traditions within linguistics. Some theorists would suggest that linguist traditions are related via a rhizomatic structure. This study suggests, however, that an arboreal structure

is evident, provided the analysis examines the metatheory of the respective traditions, and not simply the species-level concerns.

14. In commenting on intersubjectivity, K. A. McElhanon points out that, from the insider's position, an emic perspective seems to be objective, because it is never challenged by fellow members of the group. An etic perspective, as produced by an outside observer, highlights subjectivity by comparing the emic perspectives held by various groups (1998, personal communication). Readers should note that this use of the terms emic and etic appeals to usage employed by K. L. Pike, rather than to that of M. Harris (see Headland, Pike, and Harris 1990).

15. As addressed in section 4.1.7 of the present study, in his 1970 Postscript, Kuhn revised his position regarding this "pre-paradigm" periods, suggesting instead that the contrast was better cast as a distinction between the extent of unification around a single paradigm and a shift to problem-solving (Kuhn 1996:178-179).

16. McCawley's article has been published in two versions (1976, 1979), with additional footnote material occurring in the second version. This discussion references the 1979 version.

17. McCawley does reference a 1970 article by Kuhn, but that reference is to *Reflections on My Critics* (in Lakatos and Musgrave 1970:231-278), and not to *Structure*.

18. For additional arguments against a paradigm-shift characterization of the Chomskian revolution see Percival (1976:288ff), McCawley (1979), and Makkai (1993:1, 2, 6).

19. *Cynosure*: "a center of attention or interest" (Neufeldt 1989).

20. Masterman writes:

This pre-scientific and philosophic state of affairs sharply contrasts, however, with *multi-paradigm science*, with that state of affairs in which, far from their being no paradigm, there are on the contrary too many. (This is the present overall situation in the psychological, social and information sciences.) (1970:74)

21. The footnote cited is not included in the 1976 version of McCawley (1979).

22. "Unity of knowledge" is, generally, the philosophical position that knowledge is one thing, that it is all equal and of the same essence. It implies that the unfolding history of human inquiry displays one continuous stream, increasingly moving toward progress, rather than divergent streams or non-continuous streams punctuated by temporal periods and non-contiguous traditions.

23. Exclusion of competition would in fact be counterintuitive for Kuhn's theory, for it would ultimately prohibit investigation leading to revolution.

24. In mentioning the 1959 English translation of *Cours*, Harris is apparently referring to the first edition of Baskin's translation (see Saussure 1988).

25. Readers should note that this quotation is from the 1962 section of *Structure*, in which Kuhn also used the term paradigm in referring to what he later (1970) identified as the disciplinary matrix.

26. 'Communication theory,' a label based upon Shannon's original title, *A Mathematical Theory of Communication* (1948), has occasionally been used to refer to Shannon's theory. 'Information theory' is the label more commonly used, and is therefore the label used in this study.

27. As with generative linguistics, readers may also note some similarity between Kenneth L. Pike's notion of a form-meaning composite and the notion of signs espoused by Saussure. Pike, however, is careful to distinguish his own view from that of Saussure (Pike 1971:63). It should also be noted that, in contrast to Saussure and Chomsky, Pike is intensely interested in context. Indeed, he defines the key component of his theory, the tagmeme, as a "unit in context."

28. The sense of *module* intended here is that of "a detachable unit with a specific function" (Neufeldt 1989:277).

29. It appears that speaker-listener and speaker-hearer were employed as synonyms and that the terminological distinction had no real bearing on the theory (see Harris 1981:32, n. 1).

30. Sperber and Wilson use the symbol $\{I\}$ to designate "set of assumptions."

31. It is interesting to compare Sperber and Wilson's teleological view of language as having the purpose of cognition (with communication simply being a byproduct) to the view of Saussure and the contrasting view held by Locke. As discussed in section 3.2.2.2.1, Saussure held the view that language was essential for cognition, while his predecessor Locke had held an opposing view. As Parkinson explains:

It was evidently Locke's view (and in this he was by no means alone) that there could be thought without language; that what he called the various 'operations of the mind' ([*Essay Concerning Human Understanding*] 2 ch. 11) could be exercised on ideas alone, even if there were no language. Language does not exist, then, because man is a rational being; it exists, according to Locke, because man is a 'sociable creature', and language is 'the great instrument and common tie of society' ([*Essay Concerning Human Understanding*] 3.1.1). (Parkinson 1977:1-2)

32. It may be noted that Sandra Thompson, who has co-authored with Paul Hopper (see Hopper and Thompson 1984, 1985) on the topic of lexical categories, also co-authors a work on Rhetorical Structure Theory, which does explicitly reject at least certain aspects of the code model (Mann, Matthiessen, and Tompson 1992:45). In particular, the rejection concerns the idea that the string of speech codes information units. (Rhetorical Structure Theory is an approach which employs rhetorical theory in assessing the structuring of discourse units. It is concerned with the pairing of what may be called notional structure with surface structure at the discourse level –also see Mann and Thompson 1988, Longacre 1983)

Analysts using emergent grammar do occasionally use the term “coding,” but they do not appear to be appealing to the broader notion of the code model. For example, see Traugott and Heine (1991), where the term is used in the following ways:

“... but it is well known that languages prefer relatively heavy and explicit coding of objects in such environments.” (Lichtenberk 1991:57) CODING = CASE MARKING

“The factor of coding efficiency can be seen as blocking the use of ... [particular forms].” (Lichtenberk 1991:57-58) CODING EFFICIENCY = FUNCTIONAL BIND

“These clauses differ from the other subordinate clauses in that they are not explicitly marked as adverbial, i.e. of coding condition, concession, temporal sequencing, or causation” (Genetti 1991:173). CODING CONDITION = (?)

“Presumably, considerations of *relative coding density*—i.e. functional load—also play a role in such extension” (Givón 1991:288) CODING DENSITY = FUNCTIONAL LOAD

33. In regard to adoption of these conditions by generative grammarians, Givón writes: “Chomsky absorbed, without explicit discussion, Saussure’s and Bloomfield’s separation of synchronic from diachronic studies, as well as the assumption that it was indeed possible—and somehow desirable—to formulate universals of language, whatever their nature, on a purely synchronic basis” (Givón 1984:8).

34. Edmonson and Burquest (1998:231-232) attribute this chart to Susan Herring. Unfortunately, they provide no citation or bibliographic entry for Herring’s work.

35. It is also important to distinguish *cognitive linguistics* from *cognitive science*, one approach to which is “a comprehensive philosophical and scientific research program, based on the assumption that man is a machine and can be described as such” (Kirkeby 1994:593).

36. While going to some length to develop new terminology appropriate to his theory, Langacker does retain some code-model terminology. For example, he frequently employs the term “encoding.” However, he does slightly alter the definition (see the glossary in Langacker 1987:485-494):

coding, and the coding problem The relation between linguistic units and usage events; the coding problem is to find an appropriate target structure that fits a sanctioning unit within some expected range of tolerance. (cf. target structure) (Langacker 1987:487)

target structure The object of comparison in a scanning operation. A solution to the coding problem. In a dependent structure seen as a “function,” the “output” of that function: the substructure corresponding to the composite structure and determining its organization. (Langacker 1987:493)

Chapter 5

1. Reductionism: "Also called reductivism. The reducing of certain kinds of entities, or of theories, or even of whole sciences, to other, more basic, ones; entities that are reduced may be replaced ... or simply explained Reductionism in general appeals to empiricists, nominalists, and others who use Ockham's razor to achieve a sparse ontology (or list of what there is)" (Bothamley 1993:454-455).

2. In this case, the form is hypothetical syllogism (Weston 1992:51), producing the form:

If p then q.
If q then r.
Therefore, if p then r.

3. It is important to distinguish the terms *egocentrism*, "viewing everything in relation to oneself," and *egoism*, that is, "selfishness" (Neufeldt 1989:139). The two are often confused in common usage.

4. False dilemma: a fallacy in argumentation which involves "reducing the options you consider to just two, often sharply opposed and unfair to the person against whom the dilemma is posed Arguing from a false dilemma is sometimes a way of not playing fair: it also, obviously, overlooks alternatives" (Weston 1992:86).

5. Unfortunately, Burke supplies no reference for Stephen, except to say that it comes from a work titled *The Misuse of Mind*.

6. The null hypothesis in this case would be the statement: "There is no fixed relationship between *langue* and *parole*." The alternative hypothesis would be the statement: "There is a fixed relationship between *langue* and *parole*." Statistically, the linguist can never truly accept the alternative hypothesis. His goal, then, is to reject the null hypothesis. This rejection is then interpreted as support of the alternative hypothesis (see Latch and Lazaraton 1991:24).

7. Bothamley concisely reviews the notion of communicative competence as follows:

Hymes criticized the limitations of A.N. Chomsky's theory of linguistic competence: the 'ideal speaker-listener' does not correspond to real speaker's abilities; performance in Chomsky is negative, but could be reformulated as an account of language variation and appropriateness in contexts of use. Communicative competence would include the range of abilities requisite for a speaker to communicate effectively in real situations. (Bothamley 1993:104)

8. Unfortunately, Burke provides no reference or information concerning Woodger, except to mention that Woodger addresses the quarrel over structure and function in biology.

9. Hypostatize: "to attribute real identify to (a concept)" (Mish 1983:594).

10. In considering the problem of meaning and its relationship to the problem of variation, it is interesting to review Chomsky's appeal to the linguistics of Humboldt.

While Chomsky compares his notion of competence to Saussure's *langue*, he compares his psychological approach to that of Humbolt (1964). In regard to meaning and variation, this creates an anomaly for Chomsky's notions of competence, the "ideal speaker-listener," and "associated intrinsic semantic interpretation." Chomsky follows the Saussurean tradition regarding synchronic linguistics; being pre-Saussurean, however, Humbolt maintained an evolutionary view of semantics, providing for variation in time and difference between speakers intention and hearer's understanding (see Chomsky 1964:54). Such a notion of semantic variation is, of course, incompatible with the code model view.

11. As Hatch and Lazaraton explain, "An independent variable is a variable that the researcher suspects may relate to or influence the dependent variable. In a sense, the dependent variable 'depends' on the independent variable" (1991:64).

12. Following Saussure's lead, linguists have traditionally treated written texts as inferior to spoken language. Joseph writes:

Saussure formalized the marginalization of written language as well as anyone, and if its survival is often viewed as a Saussurean tradition, it is because he has borne the brunt of the 1967 attack on this marginalization by Jacques Derrida (1930-). For Saussure, writing is not language, but a separate entity whose only 'mission' is to represent real (spoken) language. The 'danger' of writing is that it creates the illusion of being more real and more stable than speech, and therefore gains ascendancy over speech in the popular mind. Derrida demonstrated the irrationality and internal inconsistency of this extreme phonocentrism; in his deconstructionist wordplay, all language is a kind of 'writing' (in a sense that is unique to Derrida). (Joseph 1994:3665)

13. Some models attempt to circumnavigate this problem by positing the notion of an average or typical speaker and hearer. In such accounts, the model is held to be true for the typical case, and when communication "fails," it may be attributed to atypical communicators. A model of communication should not require the theoretician to make a subjective judgement concerning the communicators, for the average speaker and hearer never exist (see Reddick 1992:217).

14. This author first heard the phrase "history of use" from R. J. Reddick (1995, personal communication). Unfortunately, neither this author nor Reddick are aware of the origins of the phrase.

15. Harris writes:

The difference between a circuit model and a rectilinear model is the difference between a circle and a straight line. The difference between a circuit model and a helical model is the difference between a circle and a helix or spiral. Of these three types, only helical models (Dance 1967) are formally appropriate to capture the dynamic or developmental aspects of speech communication. Circuit models can make no allowance for the progressive modification of the communication situation through time. For circles always lead back to an original point of departure. The only aspect of temporal progression a circuit model allows for is the time it takes for information to

- pass from one point in the circuit to another point, and the only aspect of modification allowed for is the alteration in the form of the signal as it passes from one section of the circuit to the next. (Harris 1987:214)

16. It is important to distinguish the notion of a hermeneutical helix from the idea of a hermeneutical spiral, as proposed by Osborne (1991). The helix is intended to characterize the evolving communicative situation, as described by Dance (1967). Osborne's spiral, in contrast, is intended to characterize an exegete's effort to increasingly purify understanding and hypotheses regarding authorial intention. Osborne writes:

Scholars since the New Hermeneutic have been fond of describing a "hermeneutical circle" within which our interpretation of the text leads to its interpreting us. However, such a closed circle is dangerous because the priority of the text is lost in the shared gestalt of the "language event" A "spiral" is a better metaphor because it is not a closed circle but rather an open-ended movement from the horizon of the text to the horizon of the reader. I am not going round and round a closed circle that can never detect the true meaning but am spiralling nearer and nearer to the text's intended meaning as I refine my hypotheses and allow the text to guide my delineation of its significance for my situation today. (Osborne 1991:6)

17. See Harris (1990:47-48), where Harris discusses the necessity of a "principle of cotemporality." Harris writes:

This principle, which orthodox linguistics fails to recognize, is of basic importance if we wish to have a theory of language which can explain how and why communication invariably proceeds on the assumption that every linguistic act is integrated into the individual's experience as a unique event, which has never before occurred and will never recur. (Harris 1990:48)

18. Harris (1990:49) similarly dispenses with the traditional concept of meaning, suggesting instead the term *communicational function*, stating: "... the communicational function of a sign is always contextually determined and derives from the network of integrational relations which obtain in a particular situation."

19. See Harris (1980:29f) for a discussion of the historical development of the notion of "a language." Harris opens that discussion with the statement: "Unequivocal insistence on the priority of the concept of 'a language' over that of 'language' is first found in the work of Saussure, although the point has perhaps been obscured for his English readers by the vagaries of translators" (Harris 1980:29).

20. In the alternative account, the notion of patterned usage attempts to cover much of the same area previously covered by the notion of rules. In the alternative account, however, usage is acknowledged as being variable, without strict regard for what may or may not be considered "grammatical" by any particular speaker. It is a fact that supposedly ungrammatical usage is produced every day by nearly every speaker. Correspondingly, that supposedly ungrammatical usage is generally understood by hearers. The code model of communication simply cannot account for these facts.

Part of the problem here is the notion that a grammar accounts for some consistent, underlying set of rules held by the group (the *langue*). The historical (and contemporary) influence of prescriptive grammarians has undoubtedly influenced this view. Joseph Epstein recounts an interesting episode which helps to distinguish the problem of usage and comprehension from that of prescription and expectations. Epstein gives his students—would-be novelists, essayists, and poets—the following two sentences that between them contain five errors: “Hopefully, the professor will not be altogether disinterested in the work on which I am presently engaged, which I believe is rather unique. But then everyone has their hopes.” He recounts that his students have a tough time finding the errors. Many find several errors that aren’t there. Others identify errors, but cannot explain why they are errors. Concerning the conclusion to the exercise, Epstein writes:

After putting the students through this little torture, the first effect of which seems to be to discourage them about their own high valuation of themselves as users of the English language, I ask what difference any of it makes. The problem, certainly, isn’t one of clarity, for the meaning of the two sentences, even with their five errors, is perfectly clear. The problem, I assert, is that of offending the educated—of looking a fool in the eyes of those who know better. (Epstein 1997:30)

21. Pike (1979) is a film documentary of Kenneth L. Pike lecturing on the monolingual elicitation exercise and giving a demonstration of the same. Makkai (1993:165-168) provides a concise but detailed written description of the exercise. Briefly described, the monolingual exercise involves Pike (or a trained linguist) meeting with an informant with whom he is unacquainted, and with whom he shares no language and about whose language he knows nothing, not even what it is called. Beginning with only gestures and a few props (stones, leaves of various size, twigs, and so forth), Pike begins to elicit data from the informant. When he has elicited a few words and simple clause and sentence patterns, he then begins to use the language just elicited as a research language. By the end of the half-hour exercise, Pike is able to carry on simple conversation with the informant using the words and patterns just learned. Pike calls the demonstration a monolingual exercise because the entire procedure is conducted monolingually. That is, Pike does not speak any language other than that of the speaker during the entire process.

22. The reader may find Blair (1990) a useful introductory discussion on the process of establishing the arbitrary boundary we call language.

23. Crystal defines the *cocktail party phenomenon* as follows: “An everyday effect studied scientifically in psycholinguistics as part of a theory of speech perception. It refers to the process of selective listening, whereby people listening to several conversations at once are able to attend consciously to one of them, and to ignore the others” (Crystal 1997:66).

24. A analogical comparison to biological studies may help to explain how a processual view is neither diachronic nor synchronic. Consider, for example, biologists studying zebras. In a biological context, a diachronic view produces a paleontological account of the zebra and its evolutionary ancestors. A synchronic view produces taxonomy, anatomy, and physiology of the zebra, selecting particular animals as

objectified representatives of the whole. In contrast, a processual view produces a science which sees the zebra not as a object, but as a gene pool of individuals interacting with its environment. Such an approach integrates certain interests also covered by paleontology, taxonomy, anatomy, and physiology; however, a processual approach does not view the problem of the zebra in the same manner as any of the respective specialists mentioned. (Such a processual view is, in fact, commonly held by contemporary biologists.)

25. For example, in 1997, this author heard a prominent linguist give an address in which he made an appeal for the practice of what he called "theoretical linguistics," explicitly adding that by this term he *did not intend* the work of Givón, Lakoff, or Langacker. Of course he was not suggesting that these three theoreticians have no theory, but rather, that he considers their approach to be marginal. They do not fit within what he considers the essential core. In other words, "that's not linguistics."

26. Devlin notes and discusses increased interest in meaning and context, which Chomsky relatively ignored, as well as "two other key features of communication that Chomsky ignored: cultural knowledge and the structure of conversations" (Devlin 1997:207).

27. See Lakoff (1987) for a discussion of folk theories concerning language and communication.

28. Readers unfamiliar with poststructuralist perspectives may find in Osborne (1991:366-396) a concise and useful overview of relevant issues. Also see Lakoff and Johnson (1999:463ff) for a discussion of how cognitive linguistics may be seen as contesting certain premises of poststructuralist philosophy. The notion of usage and understanding being grounded in the context of experience may create a constraining effect on the possible (that is, plausible) interpretations to be attributed to any particular utterance. In this regard, the view of experiential semantics may be physically represented by a hanging mobile. A mobile is "a piece of abstract sculpture which aims to depict movement, as by an arrangement of thin forms, rings, etc. suspended and set in motion by air currents" (Neufeldt 1989). The mobile provides opportunity for movement, but only within a limited range, depending upon the points at which it is anchored. This differs, of course, from the tension-grid sculptures which may be used to represent Saussure's *langue*. The tension-grid sculptures are not anchored to any points outside their own system. (See again chapter three, note 9, of the present study.)

Chapter 6

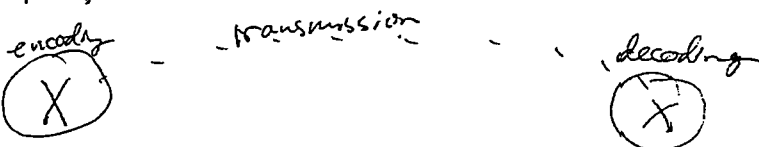
1. See Lewis (1939) for additional discussion of his views on metaphor.

APPENDIX

(1) How would you define or describe the process of *communication*?
 (Provide as long or as brief an answer as you want. Use the back or an extra page if you want. Also, feel free to draw a diagram or something if it will help.)

Concept or idea is encoded, transmitted in some form, either oral or written or other symbolic means (gestures, pictures, etc.), then decoded, by a recipient so that he also now has an idea.

encoding transmission decoding



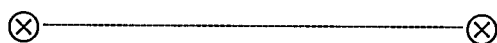
The accuracy of communication is determined by the degree to which the recipient ends up with the same concept or idea that the original sender attempted to send.

Figure 7.1. A linguistic graduate student's response to the questionnaire (April 7, 1998).

The text of figure 7.1 reads:

Concept or idea is encoded, transmitted in some form, either oral or written or other symbolic means (gestures, pictures, etc.), then decoded, by a recipient so that he also now has an idea.

encoding transmission decoding



The accuracy of communication is determined by the degree to which the recipient ends up with the same concept or idea that the original sender attempted to send. (Questionnaire response. April 7, 1998.)

- (1) How would you define or describe the process of *communication*?
 (Provide as long or as brief an answer as you want. Use the back or an extra page if you want. Also, feel free to draw a diagram or something if it will help you express yourself.)

Communication is the process by which information is transmitted from a source (usually a person) ~~to~~ to a receptor (usually another person, or group of people).

It requires, therefore, that the source and the receptor share some knowledge about the code being used to transmit the information, whether that code is verbal, visual, or otherwise.

Figure 7.2. A linguist's response to the questionnaire. (This respondent reported having earned an M.A. in linguistics.) (March 28, 1998).

The text of figure 7.2 reads:

Communication is the process by which information is transmitted from a source (usually a person) to a receptor (usually another person, or group of people). It requires, therefore, that the source and the receptor share some knowledge about the code being used to transmit the information, whether that code is verbal, visual, or otherwise. (Questionnaire response. March 28, 1998.)

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