The Socionaturalist Narrative:

An Approach to the Bio-Ecological Dynamics of Reading and Literacy Development

by

George G. Hruby

(Under the direction of Donna E. Alvermann)

Abstract

In this conceptual-manuscript hybrid dissertation, the author argues for a theoretical framework for reading and literacy education research informed by neo-naturalist trends in the social sciences, with an emphasis on current motifs in developmental psychology. Specifically, the author demonstrates that a framework intentionally located within a contextual organicist world hypothesis can complement currently competing paradigms in the reading and literacy education community by making sense of cognitive, linguistic, and sociocultural phenomena in terms of the self-organizing dynamics of living systems. This narrative avoids the reductive and deterministic accounts of sociobiology as well as the dualism and essentialism inherent in mechanistic organicist and mechanistic contextualist world hypotheses entertained by cognitive and sociocultural researchers respectively. As a narrative, it links naturalistic discourses with themes in anglophone poststructuralist epistemology. It thereby provides a means of incorporating new insights from the neurosciences, philosophy of mind, artificial intelligence, cognitive ethology, sociolinguistics, cultural and biological anthropology, dynamical systems theory, and evolutionary, ecological, and developmental psychology into theory and research in reading and literacy education. It is suggested that such a narrative can readdress questions about agency, motivation, socio-emotional development, personality, and identity in new ways for reading and literacy education theory and research. Five previously published papers touching on aspects of socionaturalism are included to demonstrate the acceptability of this narrative in peer-reviewed publications of reading and literacy.
THE SOCIONATURALIST NARRATIVE: AN APPROACH TO THE BIO-ECOLOGICAL DYNAMICS
OF READING AND LITERACY DEVELOPMENT

by

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1914-1993
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Texts, including dissertations, are always collective works. Authors stand on the shoulders of giants—and sometimes sit in their laps and even stand on their toes. It’s not unknown for authors to walk all over little people, too. They are equal-opportunity social climbers. So this is to acknowledge all of those who have contributed to this exercise and thereby hoisted me to this intellectual pinnacle.

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CHAPTER 1

INTRODUCTION

The intention of this dissertation is to argue for a philosophically cogent, well-grounded theoretical framework for reading research that can integrate physiological, psychological, phenomenological, linguistic, and sociocultural factors in literacy development in a fashion coherent with certain currently developing frameworks in the natural and social sciences. This is a tall order. To borrow a popular if portentous turn of phrase, this is calling for nothing less than a new paradigm in reading research. It would be beyond the scope of this dissertation to achieve such a goal. My intention, then, is only to provide a prologue on behalf of such an argument.

The need for such a new theoretical framework is indicated on several counts. First, there is a decided mismatch between currently evolving syntheses in the natural and social sciences and what by contrast maintains in current educational scholarship, including reading and literacy education scholarship. Over the past quarter century, a decided naturalistic turn has emerged in the social sciences, reigning in the idealist-transcendentalist excesses evident in the social sciences during the 1970s, particularly in psychology, sociolinguistics, and cultural anthropology. This turn is specifically known by several names and takes a variety of forms depending on the discipline where one
encounters it, and its implications are not uniform across the sciences. (I shall review some of this variation later in the dissertation.) But a general theme evident across these disciplines is that a starting point for all inquiry into the human is the assumption that human beings are ecologically-situated, evolved, biological entities, and that acknowledging this is significant.

Just how this assumption is conceived as significant varies from domain to domain of inquiry. But, generally, this first principle is not an invitation to indulge in nativist theories about innate human natures, or simplistic accounts of genetic determinism. Thanks to advances in the life sciences over the past several decades, our understanding of the interplay in human development of nature and nurture, environment and individual propensity, is far more complex than that. But neither does this naturalistic turn support anachronistic models of human learners as complex reactive mechanisms developing purely in response to their contextually provided programming—a motif still very much in evidence as a central tenet of most North American educational theory. The assumption of this dissertation, then, is that scientific educational research, including reading and literacy education research, ought to be coherent with what is understood to the best of our knowledge across the natural and social sciences.

Second, the current legislated insistence on scientific reading research as a gold standard for all reading education policy recommendations has set reading and literacy education into retrograde motion. Funding constraints set by Congress have forced us as
researchers to step back from considering the sociocultural contexts of literacy to once again study the internal mechanics of cognition as if these operated independently of context. Many arguments are given, but the political reality is that such cognitive research is considered to be more scientific by virtue of being less ideologically advocacy. Unfortunately, the informing theoretical assumptions on offer in reading and literacy education research for studying both cognitive structures and sociocultural contexts have been borrowed from what was once extant in other social sciences during the 1970s. In the case of cognitive structures, our theoretical frameworks come from cognitive psychology and information processing theory, in the case of the sociocultural contexts, from cultural anthropology and sociolinguistics. Due to the naturalistic turn noted above, these fields no longer entertain the theoretical positions they once did. A truly scientific reading policy, then, would be based on research informed by current theoretical frameworks from psychology, sociolinguistics, and anthropology. Current mainstream opinion in these fields is decidedly naturalistic. Yet nowhere in reading and literacy education can one find any evidence of such a theoretical perspective.

To that end, I present what I will call the socionaturalist narrative, a theoretical narrative informed by current developments in the life and social sciences, particularly developmental psychology. I will suggest that such a narrative could be conceptually, professionally, and even pedagogically useful for reading and literacy education scholarship. However, demonstration of pedagogic or instructional utility—fruitful
employment of this framework in teaching education and classroom practice—would require empirical inquiry, which would take us beyond the constraints of the conceptual-manuscript format of this dissertation (see the section on Dissertation Form later in this chapter). It could be argued that, in our field, pedagogic utility is the first and most important thing for a scholar to demonstrate. This is perhaps true, but I doubt it follows that pedagogic utility is therefore the only thing worth demonstrating. Before a theoretical framework can be researched for its pedagogic utility, it must first be coherently articulated, so researchers can know what it is they are researching, what questions about it are worth asking, and what methods are most appropriate for answering those questions. So, while I will suggest that the socionaturalist narrative might prove useful in all three ways, I will demonstrate its utility only in regard to its conceptual and professional usefulness.

This dissertation will demonstrate that socionaturalism can prompt us to think about reading, literacy, language, learning, and development in new ways to address hitherto unfinished problems and unexplored issues in our field. This dissertation will also demonstrate that the socionaturalist narrative is professionally useful in both a collective and an individual way: collectively, it can address serious paradigmatic disagreements that have had a negative impact on our professional discourse and public image, and individually it can lead to publishable scholarship. This last demonstration, by way of the included manuscript chapters, is not as self-serving as it may first sound.
Taking into account the social construction of inquiry thorough the institutions of our profession (see chapters 7 and 9 of this dissertation), only those ideas whose substantive nature are of sufficient merit to achieve publication in scholarly journals and presentation at major disciplinary conferences will be pursued, critiqued, argued, and developed by other scholars in the field. And without that collective disciplinary effort, there will be no classroom application to research. Thus, individual professional utility is initially as important as collective, conceptual, and pedagogic utility.

*The Gist of Socionaturalism*

I proceed on the assumption that reading and literacy development is conceivable not only as the result of cognitive and sociocultural processes, but also in terms of bio-ecological dynamics. The idea here is not to reduce reading and literacy development to lower-level biological processes or structures, but to acknowledge that these processes and structures can account for the emergent higher-order phenomena of interest to us. More to the point, such higher-order phenomena can be understood to demonstrate many of the same transactive and emergent dynamics apparent in bio-ecological organization more generally, from the part-to-whole organization of the cell, to the self-regulatory dynamics of human psycho-sociality, to the nature of language, texts, and meaning, to human culture and its relation to larger ecosystems. That these higher-order cognitive and sociocultural phenomena exhibit bio-ecological dynamics should not be surprising. They are, after all, only demonstrated by bio-ecological entities, which is to say, ourselves.
Philosophers such as Brentano (Dretske, 1995) have noted that the only way to ground symbolic accounts of consciousness and meaning is to tie them to inherently active, intentional agents. The only viable model for such agents in the natural world is to be found in the form of bio-ecological entities. Given the parsimony of design in nature, and a lack of empirical evidence to the contrary, we might consider that the reason cognitive and sociocultural phenomena display such similarity to the dynamics of living organizational forms is because cognitive and sociocultural phenomena are, in fact, living organizational forms. Or, if they are not literally so, it is at least useful at present to think of them as if they were.

Learning, including learning to read or to appear appropriately literate within particular sociocultural and cultural-historical environments, echoes in microcosm the natural dynamics of development—development studied on a tighter timeframe, as it were. This assumption recommends a focus on the transactive development of the literate reader with a perceived semiotic environment. (For the moment let us assume that transaction [Dewey & Bentley, 1949] is the same thing as interaction, a common misperception we shall correct later on.) Although a loose array of interactionist work on reading does exist (e.g., Bidell & Fischer, 1998; Davis, Sumara & Luce-Kapler, 2000; Rosenblatt, 1994; Spear-Swirling & Sternberg, 1998; Weaver, 1994; Yopp & Singer, 1994), this perspective is found primarily in developmental and educational studies of learning disabilities. Mainstream reading development researchers have avoided this
framework (e.g., Alexander & Jetton, 2000; Anders, 2001; Clay, 1991; Ehri, 1994; Fisher, Flood, & Lapp, 1999; Forman & Cazden, 1994; Guthrie & Wigfield, 2000; Ruddell, 1994). Rather, like their fellow reading and literacy researchers, they seem committed to one of the two prevailing reading/literacy paradigms, focusing on either cognitive or sociocultural processes, and as a result they appear only distantly informed by current bio-ecological theories and research in developmental psychology.

Of course, historically, there have been cognitive-process and social-process theories in developmental psychology, too, but there has also been a long and rich history of bio-ecological theory, not the least of which was inaugurated by Jean Piaget (Lerner, 2002; Miller, 1993; Piaget, 1952; Thomas, 2000). But current mainstream research in developmental psychology has been centered on the complex inter-nested interactions of organism and environment (e.g., Bjorkland, 2000; Damon, 1998; Elman, et al., 1996; Gardiner, Muter, & Kosmitski, 1998; Lerner, 2002; Michel & Moore, 1995; Plomin, 1990; Wachs, 2000). This may at first seem an overly close and thus narrow paradigm for reading and literacy education, though perhaps one that could easily snuggle into the gap between the other two reading and literacy foci. But the grand narrative informing this third paradigm is at least as broad in scope as either of the other two, and indeed has much to say about both psychological and social processes and about language and semiotics as well.
An Outline of the Argument

Drawing from conceptual research in developmental psychology, I would like to suggest that we would do well to envision a circle of six related theoretical positions or paradigms (see Figure 1, p. 9). As I shall explain, this circle consists of three of Stephen Pepper’s world hypotheses—*mechanism, contextualism*, and *organicism*—interpolated by three hybrid positions, mechanistic organicism (M-O), mechanistic contextualism (M-C), and contextual organicism (C-O) (Pepper, 1948). It would appear that historically and currently, mainstream reading and literacy education research has situated itself snuggly along three positions, all on one side of the circle. From afar we look like a rather crowded and self-discomfited group. As a doctoral candidate in reading education, I am in a position to join the jostling crowd, but I prefer to see all that other space around the theoretical circle as an open invitation to get comfortable. And it is from a position in that open space across the circle from which I hope to describe the positions of the rest.

I assert that reading and literacy education research is currently divided into two perspectives: one cognitively oriented, the other socioculturally oriented. This is not always readily obvious because of the seeming wealth of diverse perspectives, research foci, theoretical models, methodological preference, philosophical interpretations, and ideological views espoused in reading and literacy research today, each one claiming protective insularity from critical analysis by virtue of its emanating from a unique paradigm, with its own epistemological commitments (Donmoyer, 2001; Stanovich,
FIGURE 1. THE THEORETICAL CIRCLE
(C-O = Contextual Organicism; M-C = Mechanistic Contextualism; M-O = Mechanistic Organicism)
2000). This seeming variety seems especially impressive to those who spend all their
time in its midst and thus rarely attend to the cornucopia of ideas to be found elsewhere
in the academy.

But in spite of this seeming great variety of interests in reading and literacy
research, the debates in our field, sometimes referred to as the reading wars, often boil
down to mere antithetical dichotomies. And these various dichotomies generally align
with a fair degree of predictability (socioculturalists tend to espouse holism, qualitative
methods, applied research, social constructivism, etc., while cognitivists tend to espouse
opposite commitments) (Heath, 1991; Stanovich, 2000). This ought to suggest that there
are really only two major paradigmatic or epistemological perspectives within reading
and literacy education research constraining the debates, not countless paradigms and
epistemologies.

Donmoyer (2001) has termed the current wealth of supposed paradigms in
educational research a case of paradigm proliferation, a mistaken belief that every
special interest group, or even every individual, can be said to enjoy its, his, or her own
paradigm and concomitant epistemology. I agree with his assessment, and would insist
that epistemologies are formalized philosophical systems about knowledge and knowing.
Epistemologies are more than hunches, and paradigms are more than articulated opinions.
Thus, most of us, scholars included, do not really have epistemologies. We have
epistemological assumptions, informed by the general culture, or the disciplinary sub-
domain we inhabit. These domains rarely sport anything as formal as a paradigm, but
generally operate on covert metaphysical assumptions grounded on intuited metaphors
about the way the world is. This theory was elaborated by Stephen Pepper (1948) who
described these assumed but rarely articulated worldviews as *world hypotheses*, and
claimed that all theory—and thus all research—was conducted by their muted light. Even
formal epistemologies were elaborations of these common sense (if culturally specific)
intuitions.

As evidence of how Pepper’s theory might prove useful in our field, I enter into
evidence the history of a related social science field, developmental psychology
(Bornstein & Lamb, 1999; Damon, 1998; Lerner, 2002). The situation currently besetting
reading and literacy educational research theory over the past fifteen years or so once
pertained in developmental psychology during the 1940s, 50s, and 60s (the early history
of developmental psychology is also similar to that of our field). There and then a
bewildering wealth of theories, models, perspectives, methodological preferences,
research foci, philosophical commitments and so on flourished. Nonetheless, this
cornucopia of conceptualization often reduced to simplistically antithetical debates.
These antithetical positions also dependably aligned into two camps, generally known as
the nature-nurture debate. Given that 30 years have since passed, reading and literacy
educational researchers might benefit from a review of how developmental psychology
addressed and moved on from the nature-nurture debate.
What happened was this. Metatheoretical analysts attempted to make sense of the various positions in developmental psychology and its tendency toward dichotomous argument. Certain theorists applied Stephen Pepper’s theory of world hypotheses to the positions crowding the field (e.g., Reese & Overton, 1970; Lerner, 1976). They determined that developmental psychology was indeed divided between two basic but incommensurable sets of metaphysical assumptions, each with its own epistemological commitments: *mechanism* and *organicism*. All of the theoretical variety within developmental psychology could be organized into families of general theories that in turn could be organized into these two global theories. By articulating these worldviews explicitly, these meta-analysts helped to clarify the relationship of disciplinary positions to one another. They also helped to identify hitherto undeveloped positions within unexplored world hypotheses.

As a result of this, some measure of disciplinary orientation and coherence was brought to developmental psychology. This move also gave epistemological credibility to a group of marginalized perspectives that fit the Pepperian category of *contextualism*. Still other positions could be described as hybrids between these three distinct world hypotheses (see Figure 1, p.9). With a circle of three epistemological orientations and three hybrids between them, the idea of arguing across simplistic dichotomies seemed a relic of a cold war mindset. The nature-nurture debate became less prominent, and a greater tolerance for multiple perspectives ensued. It was almost as if Werner’s
orthogenetic principle of increased differentiation and integration (Werner, 1948) had led developmental psychology to an expansive, multifaceted synthesis. My argument is not that we need to follow in the historical footsteps of developmental psychology, but that an easily comprehended system of metatheoretical analysis could prove useful for interpreting the reading wars. (Although the nature-nurture debate is no longer a central topic in developmental psychology and related fields as it was back in the 1970s, echoes of the debate—and a hardened conviction on behalf of nurture—remain fossilized in the discourse of current educational theory, as any issue of the *Harvard Educational Review*, or *The Journal of Adolescent and Adult Literacy* will demonstrate.)

Some readers may worry that a system that identifies only six positions, as developmental psychology’s use of Pepper’s theory does, may be too constraining for the free play of our imaginations, and too simplistic. The claim that there are an unconstrained number of ways to see the world may be true, in a sense, but taken literally it is incomprehensible and heuristically useless. The mind can easily comprehend two positions at once. It can comprehend three positions at once. It can possibly comprehend seven, plus or minus two, positions at once (Miller, 1956). But it cannot comprehend a limitless number of potential positions all at once. So while we as a field may claim the epistemological credibility of innumerable paradigms, we in fact dependably gravitate towards the assumption of only two positions at once, simplistically, in antithetical relation. A circle of six positions at once would be, at the very least, less simplistic.
I think that the fact that we gravitate towards aligned dichotomies with a fair degree of predictability suggests, as it did in developmental psychology, only two currently authentic epistemological positions in reading and literacy educational research. Both of them, unfortunately, are hybrids (for reasons Pepper described, hybrid world hypotheses are often epistemologically confusing because they rely on two different, unrelatable metaphors). These two positions in reading and literacy are *mechanistic organism*, and *mechanistic contextualism*. Pure mechanism, as would be demonstrated by behaviorist approaches in reading education, is no longer fashionable, and both cognitive and sociocultural positions dismiss it as ancient history, hoping to distance themselves from it. But both cognitive and sociocultural perspectives owe more to the historical legacy of early 20th century research paradigms and their underlying anglophone epistemologies than they acknowledge. One wonders if the assertion of incommensurable paradigms is possibly more a wish for autonomous identity by research frameworks still in their adolescence, than an accurate description of our field’s epistemological positions.

In any event, it is my belief, from reviewing the current work in many of the ancillary domains from which reading and literacy education research has borrowed ideas in the past—psychology, cognitive science, linguistics, anthropology, and philosophy—that we in reading have pretty much ignored the purely contextualist and purely organicist metaphysical frameworks around the circle. We have also ignored the
possibility of a contextualist-organicist hybrid, a position as far away from mechanism on
the epistemological circle as we could get. And it is these positions that have received the
most attention in the life sciences and life science-informed social sciences over the past
fifteen years or so. Indeed, if there is any area where a growing body of exciting
syntheses can be found in these disciplines it is within a contextualist-organicist
worldview.

I therefore wish to argue for such an epistemological framework for reading and
literacy education. I call this position socionaturalism. In this dissertation I describe it and
argue for it and its implications for developmental reading and literacy research.

Dissertation Form

This report is in the form of a conceptual-manuscript dissertation, a hybrid of two
dissertation forms, neither of which is commonly employed in reading and literacy
research theses. To my knowledge, no one in our field has ever attempted such a hybrid
form. Thus, this dissertation is an experiment in form as well as substance. But the form
does allow for a unique demonstration of the substance. It demonstrates the first two of
the three hopes for the conceptual argument: that socionaturalism can be conceptually,
professionally, and pedagogically useful.

Conceptual dissertations consist of a thesis, or rational argument, in the form of a
philosophical essay on some particular theoretical question. Broad reviews of the
literature are usually included, and extensive analysis and extension of key corollaries to
the axioms and categories generated by the question are examined. The number of
chapters is indeterminate. *Manuscript dissertations* are commonly employed in the
natural sciences. They consist of two or more papers, usually research reports, prepared
and submitted to, and preferably published by, scholarly, peer-reviewed journals. A
simple introduction, literature review (complementary but not redundant to the literature
reviews already contained in the individual papers), and a conclusion bracket these
manuscripts, followed by a reference list and any other materials as necessary.
Experimental attempts at manuscript dissertations in teacher education have sometimes
been called portfolio dissertations.

A *conceptual-manuscript dissertation* is a manuscript dissertation where the
manuscript chapters are not merely presented at face value (although they can be read
that way, too), but are part of a larger argument set up by introductory conceptual
chapters. The manuscript chapters in such a hybrid dissertation may provide the
extension of the argument, or they may, as here, provide exemplars for the argument.
Readers should not expect the conceptual chapters to stand alone as a conceptual
dissertation. They are additional to the manuscript chapters that could collectively
constitute an acceptable manuscript dissertation.

**Overview of the Chapters**

There are ten chapters to this particular conceptual-manuscript hybrid and a
reference list. Chapters 1-4, and 10 are the conceptual portions of the dissertation.
Chapters 5 through 9 are the manuscript chapters. The conceptual chapters argue for a unique theoretical framework with which to inform reading and literacy research. The manuscript chapters are examples of how this unique perspective can be employed, either as a central theme or as a subtext, in publishable scholarship.

How to conceive of an epistemologically coherent, and metaphysically grounded theoretical framework, or paradigm (Chapter 2), why we in reading and literacy need a new paradigm when we clearly have at least two already (Chapter 3), what the unique theoretical framework I propose looks like (Chapter 4), and what it could mean for reading and literacy education (Chapter 10), are the contents of the conceptual portion of the dissertation. These chapters should demonstrate why socionaturalism could prove conceptually useful for our field. The manuscript chapters are all informed by socionaturalism to some extent, and the fact that all have seen print in peer-reviewed journals, or edited volumes, demonstrates that there is some professional value in this perspective.

To describe the chapters in greater detail: Following this introductory overview, Chapter 2 briefly reviews the conceptual history of developmental psychology and how historians of that field employed Stephen Pepper’s theory of world hypotheses to make some sense of it. The history of developmental psychology will be found to share certain interesting similarities with the history of reading and literacy education research. But while that field has moved beyond its paradigm debates, we have not. In this chapter I
review why, and give Pepper’s theory some of the credit. (For ease of reading, I have
located the details of Pepper’s philosophy of science in an appendix.)

In Chapter 3, the history of reading and literacy education research is reviewed,
and compared to that of developmental psychology. The paradigm debates are also noted
as are the recommendation by some that we lighten up on the theory and get back to
research. I argue just the opposite, that we need more theory to complement our research,
in particular metatheoretical analyses, and demonstrate how Pepper’s theory of world
hypothesis can be applied to making sense of the reading and literacy education
landscape.

In Chapter 4, socionaturalism is described in greater detail as a truly organicist-
contextualist perspective. Several central concepts, including emergence, transaction,
structural-functional analyses, and adaptation are explained in some detail. Empirical and
theoretical advances that illustrate these themes are drawn from several other fields.

Chapter 5 is the first of five previously published manuscripts. “Cognition and the
mind” (Hruby, 1999b), a review of Eric Jensen’s Teaching with the brain in mind, is a
simple book review from Roeper Review, a journal of gifted education. The topic of the
book reviewed is neuroscience research and its implications for improved teaching
practice. It is not a complimentary review. But note the first sentence of the last
paragraph: “It may be hoped that both the current coalescing of the neurosciences and the
naturalistic turn in philosophy of mind bode well for an eventual neo-naturalistic
framework for educational research” (p. 327). Back then in 1998, I knew there were moves afoot to tie philosophy of mind and the neurosciences together—they had been going on since the 1980s. There was a lot of coalescing going on in computer science, neural network modeling, complexity theory, evolutionary and ecological psychology, and cognitive ethology, too. Neo-naturalism was my general handle for all of this, which I now more precisely call socionaturalism.

Chapter 6 was originally entitled “The biofunctional theory of knowledge and ecologically informed education research” (Hruby, 2000a) from a special double issue of the Journal of Mind and Behavior on Ali Iran-Nejad’s bio-functional theory of cognition and learning. In my brief review, I compare Iran-Nejad’s theory to the ecological theory of perception held by J. J. Gibson. The original draft of this piece was quite effusive on the importance of an ecological perspective of perception and cognition, because, I argued, it was the only theory that coherently tied to accruing research in situated cognition, autonomous agent research in AI, ethology, developmental psychology, and psychobiology. The editors, however, felt this needed to be toned down. They also felt the philosophical analysis was too similar to what they had already accepted from Richard Prawat (2000), who had also written a response. I toned it and focused on Gibson’s work more closely (and as a result rendered the title inaccurate, but forgot to change it). Still, in the last two paragraphs, I first suggested one of the central ideas in socionaturalism.
Perhaps knowledge and understanding are not about the mechanics of data processing, but about the organic development of epigenetic, ontogenetic, and phylogenetic adaptations to an ecological surround (Bidell and Fischer, 1997; Hendriks-Jansen, 1996; Michel and Moore, 1995). Perhaps knowledge is not about the algebraic manipulation of representations, but about the meaningfulness inherent in the organism’s relationship to its perceived world (Bruner, 1990; Clancey, 1997; Neisser, 1993). But an understanding of understanding, as Iran-Nejad suggests, requires a disciplinarily integrative approach that is “wholetheme” in nature, that relates, in other words, to the many aspects of our perceived ecological surround—a surround at once physical, biological, psychosocial, cultural, linguistic, personal, sensory and symbolic. (Hruby, 2000a, p. 102)

Chapter 7, originally published as “Sociological, postmodern, and ‘new realism’ perspectives in social constructionism: Implications for reading research” (Hruby, 2001a), from Reading Research Quarterly, examines the topic of social constructionism. I review its history and application in reading and literacy research. Getting this piece accepted with only minor revisions was quite a coup (RRQ has recently been identified as the most influential journal in educational research). Although this work may seem to have little to do with socionaturalism, the new realist and neo-naturalist perspectives
described in this article as third wave social constructionism are clearly philosophically related to it. Indeed, socionaturalism presumes a neo-realist social constructionism.

Contrary to what many brain-based education promoters (and even some cognitive neuroscientists) seem to think, the neurosciences are not epistemologically unrestrained, and if we in the reading and literacy community are ever going to make sense of their research, we are going to need a coherent theoretical frame by which to do so. The neurosciences are not the only area that requires theoretical framing, however. So does educational technology research. Chapter 8 appeared in *Reading Research and Instruction* as “The descent of Internet publications: A review of literacy journals online” (Hruby, 2001b). Don Leu, the guest editor of a special technology issue of that publication, invited this review. At a preview presentation about this special issue at the College Reading Association in St. Petersburg, Florida, Marla Mallett (Leu, Mallett & Karchmer, 2000), the associate editor, expressed concern that the technology papers they received had been rather lacking in theoretical grounding. Of the 30 or so submissions they had received, said Marlette, only two had any theoretical framework to speak of. She named this piece as one of the two. Using evolutionary theory to interpret the development of different textual forms is the perspective I employed. See especially the section subtitled “Problems with the evolutionary analogy” for an obvious tie-in to socionaturalism.
Chapter 9 was the keynote address paper published in the *Yearbook of the American Reading Forum, 2000* and entitled “The social construction of literacy development and classroom ecologies” (Hruby, 2001c). This is based on the keynote address I presented that year at the Sannibel Island, Florida, conference as a last-minute stand-in, since P. David Pearson was unable to present due to illness. This paper lays out much of the argument of the conceptual chapters of this dissertation, especially those found in Chapter 3.

Chapter 10 concludes the dissertation by retracing the dissertation’s argument, and asserting its success. It then looks forward conceptually and methodologically toward future research. Exploratory definitions of “reading,” language, learning, meaning, comprehension, representation, and communication are offered, and their implications for reading research offered.

*A Note on Some Philosophical Presuppositions*

There has been much noise made but very little light shed by arguments in educational research over the nature of learning and understanding (Donmoyer, 2001), arguments inspired by debates in the philosophy of science that reverberate within reading and literacy education theory. The simplistic dichotomies that have seduced us into these arguments are probably the structures most responsible for the debate itself. Whether knowledge is found or made, or whether scientific inquiry is a matter of reflecting or constructing reality are dilemmas that have emerged between two entirely
different and thus, it is claimed, incommensurable epistemological paradigms. On the one
hand is the implied theme of rational idealism, on the other, the implied theme of
empirical materialism. The first position asserts that the world is but an idea in the mind,
and is thus itself amenable to further thought and changing opinion like any other idea.
The second position suggests that the mind is the result of natural processes in the world,
and has evolved to allow a mindful organism the ability to adaptively negotiate that
world, ergo, the world is not directly amenable to a mere change of mind (Audi, 1995).

Both positions have their strengths and weaknesses, but how you identify those
strengths and weaknesses depends on which position you have already presumed. For
instance, if you presume a rational idealist stance, you believe that carefully reasoned
theory is the only basis for deducing an understanding about anything because, actually,
ideas are all we have got; without theory, mere evidence is meaningless. Attention is paid
to theory, therefore, and that attention pays off in theoretically more sophisticated and
elegant positions than those generally offered by empirical materialists (Lincoln & Guba,
2000). But from an empirical materialist position, theory is just a means to an end; less
attention is paid to it, and so the theories it offers often seem (to rational idealists) blunt,
simplistic and sometimes naïve.

On the other hand, the impact of such inductive research in the “real” world is
powerful and those results are hard to argue with, at least if you are an empirical
materialist (Stanovich, 2000). Empirical materialists are not intellectual slouches either,
and are more than capable of observing that, historically, the privileging of the mind over the world, ideas over reality, has always led to theories that are frustratingly tautological, when not being teleological. Materialists might also claim idealism tends to rationalize authoritarian metaphysics, which in turn has all too often rationalized authoritarian regimes, as continental Europe’s historical preference for both might illustrate. Empirical observation of the natural world demonstrates that while some minds may work in an authoritarian and hierarchical fashion, the world does not. But rational idealists dismiss out of hand the idea that the world is something other than the mind itself. Man is the measure of all things, according to the idealists. And so the arguments go on (Moser & Trout, 1995).

Such arguments can be fruitful if they allow us to elaborate the tensions evident in there being both world and mind to contend with when understanding the nature of knowledge and learning. But they become fruitless when they degenerate into either/or extremism on behalf of antithetical positionality for its own sake. We in the anglophone world today labor within anglophone cultural-historical legacies and their inherited presumptions, ones at home with the pragmatic, empirical materialist perspective. Many of us can simply accept this position as common sense (even as we may question or repudiate this common sense), an historically incomprehensible position to most continentals. If we are predisposed to struggle against tradition or authority on behalf of our own identity, or if we are attracted to the allure of the exotic for the mystery and
excitement it promises, we are still in the play of our indigenous cultural-historical 
foundations, even as we play against them. This may be the reason why the continental 

technical sources from whom some American scholars borrow in their attempts at striking rational-

-idealistic stances despair over how wrong we often get them (e.g., Derrida, in Olson, 1990; 

Foucault, in Rabinow, 1984; Freire, in Steiner, 2000; Grigorenko & Kornilova [on 

Vygotsky], 1997, etc.).

Following Rorty (1999), I do not wish to position myself on one side or another of 
a duality. Hence my discomfort with the reading wars. While dualities are indispensable 
in discourse and thought, they are only tools, not truths. Our understandings are found as 
much as made, which suggests, at the very least, that there are dialectical processes in 
play. With the “linguistic turn” (Rorty, 1967), neo-pragmatist and post-Nietzschean 
philosophy moved from explaining experience and justifying science to explaining how 
language positions us on behalf of the efficacious fulfillment of certain desires. Our grand 
narratives are stories of how we believe we and the world are best presented on behalf of 
edifying conversations, and are not reflections of the way the world is in itself (Rorty, 
1979, 1999). Our selection and creation of stories to stand as grand narratives is a matter 
of appropriating convention and contingency as personal linguistic strategy. Nonetheless, 
by implication, positions are embraced as effective by virtue of how their own internal 
logic facilitates edification and positioning. Content and response both matter, but only so 
long as they are in relation.
I rely here on Berger and Luckmann’s (1966) empirically-oriented theory that our common sense understanding of the world, reality, or what stands to reason, is in large measure the result of the dialectic between persons in community and the traditional practices and beliefs of the society into which they are born. The struggle to appropriate a meaningful identity in relation to others within larger frames of sociocultural reference is at the heart of this dialectic. (I review this and related perspectives on social constructionism in Chapter 7 of this dissertation.) Work in psychology, linguistics, etc. (Hermans & Kempen, 1993; Sarbin, 1998) connects social constructionist dynamics to work in life science, thereby grounding the much remarked facility of humans in social relationship to position themselves with language and narrative as behavior quite consistent with what has been studied in cognitive ethology, animal communication, and primate sociality.

These, then, are some of the philosophical assumptions and choices underlying my approach to arguing for a third way in reading and literacy educational research. My goal, again, is to provide a theoretical framework that can coherently synthesize and make sensible research on both the cognitive and sociocultural factors in reading and literacy development. Moreover, the hope is that a bio-ecological theoretical framework informed by the best of what is currently on offer from the natural and social sciences will allow reading and literacy education research to rise to the recently mandated challenge of being authentically and thoroughly scientific.
In this chapter, I hope to demonstrate the value of easily grasped metatheoretical heuristics for focusing our understanding of a discipline’s theories and models in all their variety. I will use as an example the history of developmental psychology. I do so for several reasons. First, historians of developmental psychology have had excellent success applying Stephen Pepper’s theory of world hypotheses to the theoretical variety in their field in order to understand it better. I would like to apply Pepper’s framework to the field of reading and literacy education for the same reason. So developmental psychology stands as a good example of how Pepper’s ideas work, and how they can be applied.

Second, developmental psychology suffered many of the same disciplinary quandaries we are facing in reading and literacy education research today. These problems included acrimonious debate across a set of dichotomies that polarized into two supposedly incommensurable yet competing camps. Pepper’s framework for making sense of paradigmatic worldviews helped developmental psychologists move beyond those problems. I am suggesting that it might do the same for us. So the history of developmental psychology provides a case study of a potential solution to the paradigm debates in reading and literacy
Third, I assume that most readers in reading and literacy will not know very much about the history or conceptual organization of developmental psychology. I do not know why that should be, as I think it reasonable to place development as the preeminently pertinent topic in education theory. But from a review of the literature in reading and literacy education, after reviewing the literature in developmental psychology, it might strike one that reading and literacy education researchers are either averse to developmental psychology, or they restrict themselves to selective use of developmental theory from the 1930s (e.g., Piaget, 1932; Vygotsky, 1978). Clay (1991) has described some of the differences between the two fields, but what they boil down to is that teachers and teaching researchers have little patience with developmental psychologists who study human development rather than the interactions fostered by educational institutions. Therefore, it may be useful to review the central tenets of current developmental psychology.

Finally, the socionaturalist narrative I am championing in this dissertation is one informed by the rising tide of interdisciplinary syntheses going on in the life and social sciences. The task of integrating these syntheses—of synthesizing the syntheses—would be (a) enormous, (b) not directly of interest, in its undigested form, to most reading and literacy scholars, and (c) beyond the scope of this conceptual-manuscript hybrid dissertation. Happily, developmental psychology is one of those social science fields that
are right in the middle of this kind of synthesis. Using the predigested results of these syntheses can save us a lot of needless reinvention.

For all of these reasons, I shall briefly review the theoretical history of developmental psychology and how scholars in that field have applied Stephen Pepper’s theory of world hypotheses to making sense of it.

*The Varieties of Developmental Psychology*

It would be beyond the scope of this dissertation to review developmental psychology in detail, so I will instead review the history of commonly identified schools within the discipline. Shaffer (2002) numbered seven developmental perspectives:

1. psychoanalytic [Freud, Erikson];

2. behavioral and social learning theory [Watson, Skinner, Bandura];

3. cognitive-developmental [Piaget];

4. ethological/evolutionary [Bowlby, Gottlieb];

5. information-processing [Klahr, Siegler];

6. sociocultural [Vygotsky]; and

7. ecological [Bronfenbrenner].

Miller (1993) also identified seven schools, but, unfortunately, not the same seven:

1. cognitive-stage [Piaget];

2. psychoanalytic [Freud, Erikson];

3. social learning [Bandura];
(4) information processing;

(5) ethological/evolutionary [Bowlby, Eibl-Eibesfeldt];

(6) perceptual-development [E. Gibson]; and

(7) contextualist [Vygotsky].

Thomas (2000) identified fourteen perspectives grouped into six families:

(1) psychoanalytic [Freud];

(2) behaviorism and social learning theory [Skinner, Bandura];

(3) growth theories [Piaget, Vygotsky];

(4) computer analogues and humanistic models;

(5) bio-ecological theories; and

(6) moral systems [Kohlberg].

Thomas (2000) also found time to briefly treat common sense attribution theory, connectionism, dynamic systems theory, sociohistorical life-course theory, evolutionary psychology, ethnography, disadvantaged social conditions theory, and peer abuse theory.

As these textbooks suggest, the perspectives and theories within the history of developmental psychology are numerous and their interrelation potentially confusing. For this reason, many reviewers of the history of developmental psychology, including those in the fourth and fifth editions of the *Handbook of Child Development* (Damon, 1998; Mussen & Kessen, 1983) have appealed to metatheoretical organizing frameworks (e.g., Bornstein & Lamb, 1999; Hermans & Kempen, 1993; Lerner, 1986, 2002; Overton,
Metatheoretical organizing frameworks were popularized as disciplinary and conceptual heuristics for scientific inquiry by Thomas Kuhn’s *The Structure of Scientific Revolutions* (1962), and subsequent work in the philosophy of science (Lakatos, 1978; Laudan, 1977). But of the metatheoretical organizing structures employed in developmental psychology, by far the most prominent, and one of the more easily employed, was Stephen Pepper’s theory of world hypotheses (Pepper, 1948, 1967, 1973).

Rather than bog down this historical narrative with theory from the philosophy of science, I will jump ahead and use the history itself as an example of how Pepper’s theory works. For a more detailed and abstract review of Kuhn’s and Pepper’s ideas, see the Appendix of this dissertation.

*The History of the Varieties of Developmental Psychology*

Developmental psychology in North America began in positivist experimental psychology, much as research in reading education did (Hiebert & Raphael, 1996; Lerner, 2002). Early research involved simple experiments and the collection of descriptive data (Bornstein & Lamb, 1999). In the 1920s, the field shifted from purely descriptive reports toward explanatory research using conventionalist hypothesis testing (Popper, 1959). No longer was the developmental quest to demonstrate that operational changes appeared to occur in childhood, but to ask and possibly answer how these occurred, for what reasons, and to what degree (Bornstein & Lamb, 1999). Behaviorist
theories and learning theories were the most commonly applied. Only a few scholars pursued psychoanalytic, cognitive, linguistic, or biological research.

However, by the third quarter of the century, developmental psychology began to burgeon with theoretical analyses complementing the formerly dominant research report (Mussen, 1970; Overton, 1998). As the third edition of Carmichael’s Manual of Child Development (Mussen, 1970) made clear, this theoretical emphasis on explaining developmental processes was accompanied by an acknowledgment that there were multiple ways (theories and models) to account for findings (Bornstein & Lamb, 1999; Mussen, 1970). This increased attention to theory was largely due to an influx of European scholars into American universities, particularly after the second world war. As a result, formerly marginalized perspectives grew to a disciplinary counterpoint to the behaviorists. Freud’s and Jung’s work was rediscovered by American psychologists in the 1940s and was prominent in the 1950s. Piaget was rediscovered in the 1950s and dominated interest in the 1960s. The organicism of Werner, Schneirla, and the ethologists found eager adherents in the 1960s and 70s (Lerner, 1998). At the same time, mediated stimulus-response theories, psycholinguistic research, information processing models, and gestalt theory were also apparent.

The increase in theoretical work and the number of theoretical schools led to an increase in theoretical debates. But despite the apparent plurality of positions, the debates nonetheless gravitated around antithetical dichotomies, most notably the infamous nature-
nurture controversy. The European schools held for nature, the behavioral schools for nurture. Although extreme views were rare (the debate was far more nuanced than most non-specialists perceived), differences were sufficient to foment heated and at times rancorous argument (Lerner, 1998; Overton, 1998; Overton & Reese, 1973). Other antithetical dichotomies in developmental theory included continuity versus discontinuity in development, constancy versus change, and stability versus instability of form and behavior (Lerner, 1986). Still other debates raged over experimental versus non-experimental (field-based observational) research methods, the relative value of applied versus basic research, and the conceptualizing of the child as subject versus the child per se (Lerner, 1998; Overton & Reese, 1973).

Again, these summations suffer from their extreme condensation, but they suffice to suggest what they suggested to scholars at the time. By the third quarter of the 20th century, North American developmental psychology was increasingly polarizing into dichotomous camps. The growing stress on the organism as such and on the term *organicism* by European scholars (Schneirla, 1957; Werner, 1957), implying a holistic, biological conception of an active agent, was countered by the behaviorist and conditional schools’ own elementalist assumptions about organic entities. “Everything we learn of organisms leads us to conclude not merely that they are analogous to machines but that they are machines… organisms, even brains, are machines” (McCulloch, cited in Overton & Reese, 1973, p. 71).
In the wake of Kuhn’s *The Structure of Scientific Revolutions* (1962), and Berger and Luckman’s *The Social Construction of Reality* (1966), the debate shifted from one about theoretical positions to one about paradigms and models. Drawing from Kuhn (1962) and Pepper (1948), Reese and Overton (1970; Overton & Reese, 1973) identified two of Pepper’s world hypotheses at play in these paradigm debates: *organicism* and *mechanism*. (Pepper had actually provided five examples of world hypotheses that had proven historically fruitful in philosophy and science, each predicated on its own conceptually constraining and incommensurable “root metaphor.” Besides organicism and mechanism, there was *contextualism*, *formism*, and *selectivism*. See the Appendix for more detail on this typology and how it was used to illustrate the interpretation of theoretical argument.)

According to Reese and Overton (1970), operating within these metaphysical world hypotheses were general models that informed different families of theory. From the world hypothesis of organicism and its root metaphor of the living organism, the general model of the holistic, systemic, active agent, emerged. This informed both Piaget’s (1952) work on cognitive development and Erikson’s (1968) work on social and emotional development. Their working theories constituted two families of organicist theory. Similarly, from within mechanism and its root metaphor of the machine, the model of the statically structured, reactive agent emerged, in which families of behavioral and learning theory could be found. Thus, according to Reese and Overton (1970) much
of the debate about nature vs. nurture in development—as well as on the nature of
change, the essence of the human entity, the appropriate methods for studying
development, and the truth criteria by which to determine fact in developmental
research—could be understood as based in the tropic differences between mechanism and
organicism, or located in theoretical families within one or the other paradigm.

We will see that the crucial difference [between behaviorist research and theory,
and that of researchers like Piaget and Werner] is so fundamental and broad in its
implications that syncretism is impossible… (Reese & Overton, 1970, p. 116)

*World Hypotheses as Paradigms*

Because we will be applying organicism, mechanism and other paradigmatic
categories to reading and literacy, it is worth our time to consider the ways in which these
worldviews and their intuited metaphors were extended by the developmental
metatheorists who applied them. I will not over-elaborate this because these specific
theoretical applications do not transfer directly to reading and literacy education’s needs.
Still, some feeling for the adaptability of these constructs is in order. To begin, Pepper’s
world hypotheses are higher-order metaphysical *models*. From these, general theories of
particular phenomena might be drawn. These general theories can give rise to pragmatic
models that can inform still lower levels of theory, and so on down to scale models and
testable hypotheses (see Figure 2).
Figure 2. Models and Theories in Relation
(Inspired by Reese & Overton, 1970)
… [V]arious metaphysical and epistemological models form the determining context with which lower-order, more specific, theoretical models are formulated. Basic metaphysical models are categorically incompatible, and this incompatibility is maintained through the descending levels of models to the level of theory construction. Theories formulated within different, basic models are therefore irreconcilable and irreducible to each other. … This categorical determinism based on model presuppositions does not terminate at the level of theory construction. Rather, it extends further to influence what are and are not considered to be meaningful problems for investigation, what types of methods are to be employed, and what alternative explanations may be applied in the interpretation of the data generated. (Overton & Reese, 1973, pp. 65-66, emphasis in original)

But not every opinion could lay claim to being paradigmatically incompatible and thus immune to critique by others.

… theories formulated within one basic model constitute a family of theories. The theories in a family may differ in content, e.g., focus on cognitive or social-emotional dimensions, and may differ with respect to specific theoretical issues, but such differences will be compatible or resolvable. (Overton & Reese, 1973, p.66)
Thus, an important question was whether different theoretical positions were operating within a single worldview, or in fundamentally different worldviews. This at least provided a means of brokering agreement and discussing differences within one or the other world hypothesis.

By the latter 20th century, as the state of developmental theory was becoming clearer thanks to meta-analyses such as Reese and Overton’s (1970), it was also becoming more vexing. One concern was that if mechanism and organicism were paradigmatically incommensurable and communication between the two positions was impossible, then the central dichotomy dividing the field would never be resolved. A dialectical synthesis was precluded; the insularity of ideas looked ready to ossify.

Then metatheatrists began to identify other perspectives suggested by Pepper’s framework, but not hitherto considered. The result was the identification of dialectical and contextualist perspectives (Overton, 1984, Lerner, 1986). These perspectives emphasized change and novelty as central categories of their theories, and focused on ecological, social, and/or cultural factors in development (Herman & Kempen, 1993; Overton, 1984; Sarbin, 1998). Interaction between the agent and its environment, both of which were perceived as inherently active, were emphasized in these perspectives (e.g., Dewey & Bentley, 1949; James, 1890; Riegel, 1976; Vygotsky, 1978).
Examining the Three Metaphysical World Hypotheses of Developmental Psychology

In order to clarify what Pepper (1948), Reese and Overton (1970), and others meant by mechanism, organicism, and contextualism, particularly as these terms applied to developmental psychology, we should review these categories or frameworks in more detail.

Mechanism. The intuitive metaphor employed in the mechanistic world hypothesis is the machine. The particular pragmatic model that develops on the basis of this trope depends on the type of machine considered. The watch, the pump, the engine, or the computer are all possibilities, but the fundamental categories generated by this intuited metaphor remain the same and therefore result in the same theoretical assumptions. Behaviorists and learning theorists such as Watson (1925), Skinner (1953), and others fall into this category when it is applied to developmental psychology.

This family of models would assume that the universe is composed of discrete units whose interrelation operates like a large clock or similar machine. Causation is linear and unidirectional, and analyzed in terms on antecedent-consequent relations. Knowledge, in this view, is predicated on a naive realist epistemology, wherein meaning is thought to be a reflection of the world, or transported into an agent. Whether deliberately so or not, these views were coherent with 17th-century British empiricism (e.g., Locke, Berkeley, Hume, Mill), the worldview of America’s founding principles and its reigning populist and practically-oriented modernist ideology.
In a mechanistic worldview, human beings are understood as passive, reactive agents whose operative mechanisms are an assemblage of simple learned associations cued by an external source. The machine-entity is presumed to be at rest unless activated by external or peripheral forces, or efficient causes. Psychological functions such as thinking, desires, emotions and sensations are complex processes that can be analyzed by recourse to the simpler processes of which they are made (i.e., an elemental analysis). The structure of the organism only becomes more complex in a quantitative way by an increase in the arrangement of additional discrete units. Operations cued to chronological stage are thus switched on or off, but are inherent in the design from start to finish. In theory, the agent’s plasticity is a matter of its capacity to be programmed, and understanding which environmental alterations produced more productive behaviors was an assumed goal of this research. Given that only conditional, or antecedent-consequent causation is admitted, the default assumption of passivity, the belief in developmental continuity, and the use of elementalist analysis, scientific methodologies built on statistical quantification are encouraged by mechanistic models.

Organicism. The intuitive metaphor employed in the organicist world hypothesis is the living organism. The particular pragmatic model that develops on the basis of this trope depends on the type of organism considered. The single cell, the plant, various animals, the human body, and the ecosystem are all possibilities, but, again, the fundamental categories generated by this intuited metaphor remain the same and
therefore result in the same theoretical assumptions. The ideas of Piaget (1952), Freud (1964), Lorenz (1965), and Werner (1957) exemplify the organicist position in developmental psychology.

The universe is conceived, in this worldview, as an unfolding process following a generally constrained plan, or repeating in cycles, or in spirals accommodating temporal variations. Thus, a certain amount of teleology is at play in the progression of events. Causation is reciprocal and all four of Aristotle’s causes are presumed to be valid. Causative accounts employ structural-functional as well as antecedent-consequent analyses. As a result, a holistic analyses is required, rather than an elementalist one. The whole is different than the sum of the parts and “constitutes the condition of the meaning and existence of the parts” (Cassirer, 1951, p.31). Continual differentiation and integration are central processes in organic growth.

Knowledge is seen as being constructed by the inherently active knower by way of particular cognitive constraints, developmental dynamics, or fundamental architectures, usually on behalf of certain typical ends, but adaptive plasticity is central to this perspective, too. Cognitive constructivism follows from this worldview. These ideas were informed by continental philosophy, including the work of Leibnitz, Kant, and Hegal (the last both directly and by way of his influence on natural scientists such as Lyell, 1850, Darwin, 1871, and Haeckel, 1879).
Qualitative change in the structure of the organism is real, not illusory, and operations over the life span can be qualitatively different, hence the metaphor of the stage in development. Instincts and inherent desires develop and/or evolve to motivate situationally adaptive behaviors. The plasticity of an organism is also species-specific, and species plasticity can be located along a continuum, with humans as most plastic of all (excepting certain strains of virus and prions). Given a constructivist theory of meaning, the default assumption of inherent activity, and the importance of species-probable environments for the development of coherent, adaptive behaviors, field-based observations and methods emphasizing ecological validity are encouraged in this worldview.

The time component is understood to be as crucial to the typical or probable behaviors of an organism as is its morphology, and this allows for evolutionary and functional factors to be incorporated into accounts of development and learned change. Like all living organisms, human beings have an evolved, species-specific morphology, and species-typical behaviors geared to species-probable or preferred environments (such as social environments). These template typical development, and we, like all developmentally bound organisms, naturally gravitate to them in a discriminative fashion. Our behaviors are plastic in order to be adaptive, but this plasticity is not unlimited, and can only be sustained if it is adaptive. Our life course follows certain general
progressions, but there is a good deal of free play in that progression to develop adaptively.

**Contextualism.** According to Pepper (1948), the historic event is the intuited metaphor in contextualism, and every behavior, thing, or act, is seen as an historic event and in relation to other historic events. Novelty and unpredictability are central categories of these models, and as a result, timing is everything. Whereas organicism is interested in the integration at work in a living entity as a process, contextualism is interested in the duration and extension of the process. Contextualism assumes constant change at all levels of analysis. Given the embeddedness of every level within others, changes at one level have far reaching effects at other levels (an idea elaborated today as complexity theory), and this rebounding guarantees constant change at all levels continuously.

Because of this, any change in an object of inquiry must be understood in relation to changes occurring within the object as context and in the various contexts of that object. Therefore, in such a model, an organism is always understood *in relation* (Looft, 1973), or *in transaction* (Dewey & Bentley, 1949; Sameroff, 1983).

Lerner (1998) suggested that contextualist theories gathered increasing attention because the other two paradigmatic camps, and the antithetical dichotomies they had generated, had begun to exhaust the interest of developmental scholars. Sarbin (1998) re-articulated Pepper’s contextualism to locate his notion of the psychological importance of emplotment and narrative in thought and development of identity. Poststructural and
postmodern perspectives on development have also been described as examples of contextualism. In their *Dialogical Self*, Hermans and Kempen (1993), drawing from Pepper (1948) and Sarbin (1998), argued for contextualism as the appropriate world model for interpretive narrative theories in psychology. Hermans and Kempen (1993) also stress the importance of unexpected change (as opposed to the expected changes at the center of organicism) in human development. However, Overton (1984), and Lerner (2002), have both noted a limitation with contextualism as a scientific world hypothesis: it eschews comprehensive synthesis, and thus systematicity and predictability.

*The Professional Impact of Explicit Worldviews*

Influenced by these disciplinary events, textbooks of developmental psychology began to organize their materials accordingly. Shaffer (2002), relied on mechanism, organicism, and contextualism to group his seven theoretical perspectives of developmental psychology. So, too, Lerner (1986). But Bornstein and Lamb (1999) extended these three by suggesting three additional hybrids, thereby organizing the history of theory in developmental psychology into six traditions. These were Organicist (early Hall, Gesell, Baldwin, Janet, Piaget, Werner, and contemporary neo-Piagetians); Psychodynamic—a subtype of organicism with elements of mechanism (Freud, Hall, Jung, Erickson, and contemporary ego and depth psychologists); Mechanistic (Preyer, Galton, later Hall, Watson, and contemporary mechanistic and information processing psychologists); Dialectical—a mechanist-contextualist hybrid (Hegel, Marx, Vygotsky,
Luria, Riegel, and contemporary Soviet, activity, and dialectical psychologists); and Contextual (Peirce, James, Dewey, Mead, Bartlett, and contemporary neo-pragmatist and contextualist psychologists). Bornstein and Lamb (1999) also noted that, by the turn of the millennium, the contextualist-organicist hybrid of *developmental contextualism* (Lerner, 1986) was attracting the most interest in developmental psychology.

Developmental contextualism incorporates dynamical, emergent, and transactive notions of agency, and is suggestive of complex systems theory, as well as bio-ecological and evolutionary dynamics (Damon, 1998). *Probabilistic-epigenesis* is another term for this perspective, stressing that the organism is somewhat constrained by its form and influences, but due to the vagaries of chance inherent in a continually fluxing universe, the negotiation of structure and function result in only a probabilistic developmental trajectory, not a teleologically determinative one. Socionaturalism is also a type of contextualist-organicism, so we shall be explaining this hybrid worldview in greater detail, particularly in Chapter 4 and Chapter 10.

To recap, historical accounts (Damon, 1998; Lerner, 1986, 2002; Mussen & Kessen, 1983) suggested that by the fourth quarter of the 20th century, developmental psychology was proliferating perspectives within at least three and possibly six potentially incommensurable paradigms. But as confusion and consternation gave way to comprehension, or at least some sense of order, thanks to these theoretical meta-analyses, comprehension allowed for tolerance, and tolerance allowed for acceptance (Lerner,
Whether, and how an increase in theoretical work, metatheoretical analyses, and identifiable contextualist and hybrid worldviews led to (or were caused by) an increased tolerance for theoretical diversity is uncertain. But, in coordination with advances in life science research undermining the categorical foundations of the nature-nurture debate, the dualisms of mid-century development theory fractured into multiplicity. This diversity was not, as some feared, the start of a growing dissolution. On the contrary, such differentiation portended integration.

There is some evidence from the past decade that these diverse perspectives have begun to coalesce around syntheses centered in a neo-organicist (probabilistic-epigenetic, or developmental contextualist) worldview and interrelated by dynamical system theories of living organization (Bornstein & Lamb, 1999; Damon, 1998; Lerner, 2002; Michel & Moore, 1995; Schore, 1994; Siegel, 1999; Thelen & Smith, 1994). This framework is also taking on a meta-analytic function as well, helping to locate the various research programs and foci of the field into the various embedded levels in its multi-tiered model of human developmental systems. The popularity of Pepper’s analysis is giving way to this more sophisticated metatheoretical framework. (I will have more to say about this current paradigmatic turn in developmental psychology and in other fields in Chapter 4.)

The foregoing ought to suggest to those of us in reading and literacy education research that it is possible to move beyond paralyzing dichotomous debates and paradigmatic incommensurability without giving up high theory. And one of the ways to
do that is to apply *more* theory, particularly metatheoretical analyses such as Pepper’s theory of world hypotheses. And that is precisely what I will try to do in the next chapter.
In this chapter I want to explore whether a Pepperian meta-analysis similar to that employed in developmental psychology during the second half of the 20th century could prove valuable in understanding the research debates in reading and literacy education. My claim is that it can. To that end, I will consider how the history of reading and literacy education research compares to the history of developmental psychology reviewed in the previous chapter. There is a lot of history here, so my review will constrain itself to the development of theoretical frameworks. I will also attend to concerns in our field about the reading wars and paradigm proliferation, and re-assert my claim that the reading and literacy education research literature only suggests all of two closely related epistemological frameworks undergirding the wealth of individual agendas in reading and literacy education theory.

I will disagree with the prescriptions of several reading scholars that we should retreat from global and epistemological theory (e.g., Dillon, O’Brien & Heilman, 2000; Stanovich, 2000). Instead, I will insist that what we need is (a) more such theory, (b) attempts at metatheoretical analysis that move beyond mere descriptive listings of our theoretical perspectives, but instead make their relationship coherent, and (c) the
establishment of a viable third alternative (at least one, for starters) to break up the
dialectical tension between the two currently dominant stances. I will then attempt to
interpret the various positions in reading and literacy research by the light of Pepper’s
theory of world hypotheses (Pepper, 1948). This interpretation will be cursory, because
the assortment of perspectives and issues are great, but sufficiently detailed to be
exemplary of how such meta-analyses can be useful. It will establish that there are
currently only two dominant world hypotheses in reading and literacy education research.
Having done all this, we will be ready to explore the possibility of a third position
elsewhere along the theoretical circle in the chapter to follow.

*Trends in Developmental Psychology and Reading Research: A Comparison*

My review of the history of North American developmental psychology suggests
an agreement among historians of that field on there having been a turn from strict data
gathering and descriptive research early in the 20th century, to greater attention to
explanatory research and theory in the middle 20th century. These historians also
acknowledge a move from strict behavioral and learning approaches in the early 20th
century to debates between behavioral, psycholinguistic, psychoanalytic, ethological,
social programming, learning, and other perspectives in the second half of the century.
What began as arguments between a number of theoretical positions, polarized into a set
of theoretical dichotomies. But these could be organized within metatheoretical structures
such as Stephen Pepper’s theory of world hypotheses (Pepper, 1948). Such matrices were
used to organize the disciplinary fragments into mechanistic, organicist, contextualist and hybrid metaphysical worldviews (Bornstein and Lamb, 1999; Lerner, 2002; Reese & Overton, 1970).

Recent work in developmental psychology has tentatively attempted to synthesize some of these positions (e.g., Elman, et al., 1996; Hendriks-Jansen, 1996; Schore, 1995; Siegel, 1999; Wachs, 2000). Incommensurability is apparently no longer taken to mean incomprehensibility in that field, and thus communication and conceptual translation is possible across paradigms. Human development is apparently a many-splendored thing, and there is a place in the grand expanse of it all for numerous research programs and theoretical perspectives. Differentiated integration is not reduction and simplification, but a path to coherence and enriched coordination (Lerner 1998).

What I find upon comparing this history of developmental psychology with that of reading and literacy education research (which I will review in more detail later in this chapter), is that both were born of experimental psychology, both endured half a century of behaviorist hegemony, both experienced an influx of new ideas from elsewhere, and, as a result, theoretical debate and model and theory construction burgeoned. But so did divisiveness. What seemed like a multiplicity of agendas condensed in both fields around antagonistic dichotomies that aligned into camps. Here the similarities end, in part because reading research has only recently arrived at this juncture. But using the experience of developmental psychology as a guide, we might consider the value of
metatheoretical analyses for making sense of our arguments. Perhaps a good place to begin would be by employing Pepper’s theory of metaphysical world hypotheses. It worked for developmental psychology; it might work for us. Also of value might be a paradigmatically legitimate third perspective with which to break up the polarity of the current situation. Again, it seemed to be a factor in developmental psychology’s resolution of its most acrimonious debates.

However, the foregoing recommendations assume that what we in reading and literacy are suffering from really is paradigmatic incommensurability. But this might not be the case. The influx of researchers who enlivened developmental psychology came mostly from continental Europe, and brought continental philosophical and epistemological assumptions with them into the field (Lerner, 1998). Thus, a true paradigm debate between different sets of epistemological commitments was enjoined, as it was in many other sciences and in the humanities in North America during this period (Lincoln & Guba, 2000).

In reading and literacy education research, by contrast, the influx of new research came from researchers in different fields within the North American scientific enterprise who were already philosophically and epistemologically located in the anglophone empiricist tradition. Thus, the move from behavioral to cognitive research (during the 1960s through 1980s, but still current) did not really constitute an epistemological paradigm shift as some have suggested (e.g., Gaffney & Anderson, 2000; Kamil, 1984).
but merely a shift in theoretical paradigms. Cognitive models were and still are largely mechanistic, and empiricist assumptions are still favored in cognitive research. As Kamil (1984) noted, what makes this confusing is that cognitive theories of learning are about knowing, and hence are inherently epistemological. But to suggest, say, a constructivist rather than a transmission model of knowledge is, in this instance, a theoretical shift. The researchers themselves are still using hypothetico-deductive methodology to assess the truth of things on behalf of common sense problem solving. Thus, reading researchers did not need to throw off any major epistemological commitments to move from one perspective to the other.

The subsequent move in reading and literacy to sociocultural research (1980s and on) also claimed to represent a paradigm shift (Hiebert & Raphael, 1996; Lincoln & Guba, 2000). As with the cognitive shift, this turn required researchers to embrace different research foci and theoretical commitments (Heath, 1991; Stanovich, 2000). But it also insisted on radically different epistemological commitments. Still, it is important to note that while the debates in developmental psychology were engaged first, and recognized as evidence of paradigmatic incommensurability later, the debates in reading and literacy in the 1980s onward seem to start with the claim of paradigmatic incommensurability. Whether this claim is substantiated by anything but a listing of dichotomous differences and a desire for insularity is a good question (McKenna, Stahl & Reinking, 1994; Stanovich, 2000). My suspicion is that the need for professional self-
definition and the necessity of the new in academic scholarship are in play here—professional and institutional factors, not epistemological ones.

Having stated all this by way of caveat, I am nonetheless going to assume that the paradigmatic differences in reading and literacy education research between cognitive and sociocultural factors aficionados are legitimate, but not so numerous or severe as some might suggest. Whatever they are, I will assume these two positions can be located on the theoretical circle developed in developmental psychology (Figure 1, p. 9). Such assumptions lead me to suggest that there really are only two paradigmatic perspectives in play, and they are epistemologically related: mechanistic organicism (the cognitive factors group), and mechanistic contextualism (the social and cultural factors group). They are thus both hybrids, and, as we have noted, this is itself cause for caution. (We have already reviewed Pepper’s claim that hybrid world hypotheses are confusing.) In an epistemological sense this is a shift only in the limited sense of a modest movement or rearrangement.

A History of Reading and Literacy Theoretical Frames

Let me review the basic historical outline of reading and literacy research that informs these claims. Venezky (1984) noted that the history of reading research during the first half of the 20th century did not present a unified, “continuous stream of human endeavor but at least four and perhaps as many as six independent threads, each with its own methods and each moving to the beat of a different drummer” (p. 3). These were (a)
basic research on reading processes emphasizing perception and to a lesser extent comprehension, (b) research on reading instruction, (c) the testing movement, and (d) the study of literacy and the historical role it has played in society. Other possible research areas included readability, legibility, and reading disabilities. Venezky noted that throughout the century research on reading processes was mostly cognitive research, by which he meant general research on the mind’s attributes. This work included perceptual research from the first decades of the century as well as later schema theory explanations of comprehension. (Venezky employed a broad definition of cognitive psychology, one not entirely focused on the cognitive revolution of the 1960s.) But despite this thematic continuity of cognitive research, the history of reading research turned out to be uneven.

In reflecting on this history, it is difficult to ignore its fragmented, staccato nature.

Reading research has not made a disciplined journey over the landscape of time. Instead, it has started and stopped, then gushed forth again for a few years here and there, sometimes in many places at once, but seldom with the continuity that accumulates strength and definition with the addition of each merging stream. Ideas were pursued vigorously and then abandoned, some to be rediscovered many years later and others to be ignored. No single cutting edge was ever definable; only a series of different foci that waxed and waned, often without sight of each other. (Venezky, 1984, p.27)
To evaluate Venezky’s complaint, consider Harris (1969), who summarized reading by each decade’s most favored research approach or program. His chronology begins with perception studies (1910s); extends to case studies (1920s); then to evaluation and behaviorism (1930s); to reading comprehension defined by psychometrics and factor analysis (1940s); to experimental research with accompanying hypothesis testing and statistical tests (1950s); to an influx of work by scholars from other disciplines including psychology, linguistics, sociology, and medicine (1960s) (cited in Dillon, O’Brien, & Heilman, 2000).

The result of this “influx” of scholarship from outside of reading education in the 1960s is also described by Holmes and Singer (1964):

… at least three new and exciting trends are clearly discernable: a) a concerted effort at theory building, b) a greater concern for design, and c) a host of new instruments and techniques. (p. 150)

This was precisely the trend observed by historians in developmental psychology starting in the 1950s due to an influx of researchers from Europe (Bornstein & Lamb, 1999; Lerner, 1973; Reese and Overton, 1970). Nonetheless, Holmes and Singer (1964) saw no cause for concern:

A field of study is generally headed for a spurt of creative productivity when theory construction and experimental research become closely interdependent and mutually directed. All signs indicate that the psychology of reading is on the
threshold of just such a forward thrust and that both stimulating and disturbing
days lie immediately ahead. In this new atmosphere, cherished ideas are found to be challenged, and new ones will contend for their places when the old ones fall.

(p. 150)

Kling (1971a) related the genesis of this trend towards model building in reading research:

Systematic theory building in reading essentially began in 1948 with Holmes’ Substrata-Factor theory and gained momentum in the late 1950’s (sic). While most of the earlier theories tended to rest largely on the observation and psychology of reading, theoretical formulations of the middle and late sixties emphasized concepts drawn from linguistics, psycholinguistics, and cognitive psychology. (p. 1-11)

This attention to models and theories in reading research led to attempts to categorize the models into families of research or research influence, not unlike the early attempts in developmental psychology. The first volume of *Theoretical Models and Processes of Reading* (Singer & Ruddell, 1970) identified five types of models: (a) Linguistic, (b) Psycholinguistic, (c) Information Processing, (d) Cognitive Processing, and (e) Perception. Reviewing the published research, Kling (1971b) similarly identified five sources of reading models, although his choice was a bit different: (a) Psychology,
(b) Psycholinguistics, (c) Information Processing, (d) Sociolinguistics, and (e) Biobehavioral Sciences.

In spite of this heady and potentially confusing increase in models, theories, influences, and perspectives, Kling (1971b) was hopeful about the prospects for the field of reading research as a result.

There seems to be a tendency toward reconciling the differences between the models proposed to explain the nature of reading. Behaviorists, for example, are modifying the familiar S-R paradigm of learning to include the cognitive functions found in the S-O-R paradigm…. Other differences will tend to disappear as changes occur in terminology and level of knowledge in the underlying disciplines, in the type of measurement and analysis employed, and in the methodology used. (p. 2-4)

But 13 years later, in the first *Handbook of Reading Research*, Kamil (1984), focusing on reading research in the second half of the 20th century, still observed several perspectives informed by “cognitive and physiological psychology, linguistics, anthropology, computer sciences, social psychology, learning theory, and educational practice” (p. 39). Reading research was informed by three central ideas, according to Kamil, the idea of the reader as an active information processor, the development of discourse analysis applicable to reading, and an interdisciplinary interest in translating research into practice. Although Kamil likened this to a Kuhnian paradigm shift from the
earlier behaviorist research framework, he warned that “what has looked like a shift has not consolidated, despite the use of seemingly appropriate jargon in much published reading research on traditional problems” (p. 40). One of the difficulties with applying Kuhn’s epistemological paradigm theory in educational research, according to Kamil, was that it broke down when applied to research on learning, an inherently epistemological enterprise. “[M]uch educational research undertakes to verify or validate what amounts to epistemological beliefs…. Underlying [this] research are epistemological assumptions about what knowledge is, how it is obtained, and how it is used….Empirical testing of [these] assumptions is inappropriate…” (p. 43). In an uncredited echo of Pepper (1948), Kamil (1984) concluded by stressing the need for the development of consistent and extended theories.

By the fourth edition of Theoretical Models and Processes of Reading, Ruddell, Ruddell and Singer (1994) identified 35 reading processes grouped into six families (language processes, social context and cultural processes, literacy development, comprehension, reader response, and metacognition). They also identified 10 models of reading, six of them cognitive processing models (the other four being sociocognitive processing, transactional, transactional-sociopsycholinguistic, and attitude influence), and even three new self-declared paradigms. Two historical meta-analyses are also included in this edition. Subsequently, Stahl and Hayes (1997) provided treatments of fifteen models of reading instruction, two of them conceptually metatheoretical.
This burgeoning of models and the appearance of historical and conceptual meta-models indicates that growing theoretical diversity required scholars to apply metatheoretical analyses as organizing systems. These can be distinguished as either historical or conceptual meta-analyses. Following are some examples of historical and conceptual meta-analyses of reading and literacy research.

**Historical Meta-analyses of Reading Models, Theories, and Paradigms**

Several reading scholars have applied historical overviews to the unwieldy multiplicity of models, processes, theories, and frameworks in reading and literacy education research theory in order to make this diversity more comprehensible. Historical narratives are good at that, and we often employ them without concerning ourselves too much that description is not always explanation. But as we shall see, they do have a serious flaw: they tend to divide the world into dichotomies.

Detailing “a 30-year journey,” Pearson and Stephens (1994, p. 22) suggested that, prior to the 1960s, researchers generally thought of reading as a perceptual process. Then in the 1960s, according to these authors, reading research was influenced by work in linguistics and psycholinguistics, as well as cognitive psychology and, later, sociolinguistics. As a result, researchers began to see reading as a psycholinguistic process. Eventually, sociological, philosophical, political, and critical perspectives became part of the growing diversity in reading and literacy research. Reading came to be seen as a social process.
Gaffney and Anderson (2000), surveying abstracts in the principle reading research journals for the central year of each decade of the second half of the 20th century, also identified a move from behavioral to cognitive to sociocultural perspectives. Both of these brief histories emphasized a major paradigm shift between behavioral and cognitive perspectives, with less emphasis paid to the shift towards social and cultural factors in reading and literacy. In fact, Gaffney and Anderson (2000) claimed that the move to sociocultural research was only an extension of the cognitive/psycholinguistic paradigm. Alexander (1998) confirmed these generalizations in more detail, and Gambrell (2000), canvassing the membership of NRC for the most influential instructional scholarship during the last three decades of the 20th century, painted a similar picture.

But Heath (1991), writing in the *Handbook of Reading Research, Volume II*, demonstrated that an historical narrative emphasized very different themes and trends when described through the eyes of a sociocultural rather than a cognitive researcher. In her history of reading and literacy education and its research, Heath noted that behaviorist and cognitivist research both failed to address how cultural and historical forces are factors in language socialization, particularly for non-mainstream students. How one learns to talk, according to Heath, has everything to do with how one comes to understand the world, and be seen by certain dominant codes as literate or not. Heath (1991) challenged researchers and teacher educators in literacy to study more “about alternative and expanded genres of language and patterns of learning across cultures and
situations” (p. 20), and to expand the ways teachers can use this knowledge in their classroom practice. Heath’s analysis was a major statement on behalf of the social constructivist turn, or paradigm shift, in reading and literacy research. This turn has also been noted in teacher education research more generally (Floden, 2001).

As an example of this paradigm shift, contained in Heath’s *Handbook* contribution (1991) there is a two column chart dating from 1986 (adopted from Hedegaard, 1986, in Heath, 1991, p.17) contrasting cultural-historical and behavioral-cognitivist approaches to thinking. According to this graphic organizer, the cognitive-behaviorist tradition is said to assume that concepts begin with perceptions of the world, but for cultural-historicists, concepts begin with the cultural and historical genesis of objects. For cognitive-behaviorists, thinking is studied as something in the thinker who is separated from the world about which he/she thinks, whereas in the cultural-historicist view “there is no conceptual border between the world to be thought of and the thinking subject because the content is in the objective world but only receives status through the thinking process of the individual” (Hedegaard, 1986, cited in Heath, 1991, p. 17). The cognitive-behaviorist is concerned with the structure/function of thinking, the cultural-historicist with the content of thinking. And so on.

From this perspective, then, the sociocultural turn most decidedly was not a mere *extension* of the cognitivist paradigm, as Gaffney and Anderson (2000) claimed, but a distinctly different epistemological stance, a perspective from which the epistemological
similarities of behaviorism and cognitive research can be easily seen. It was a radical departure, both from traditional historical accounts of reading and literacy research, and from the worldview of elementalist empiricism. There would seem to be a lot of shoehorning going on in this chart on behalf of othering anything and everything not cultural-historical in nature. But it does provide a quick and dirty demonstration that dialectical perspectives in reading and literacy are similar to those in developmental psychology, which will expedite our analysis of where to place this perspective around the theoretical circle later on.

In a highly detailed review of the reading and literacy research for the *Handbook of Educational Psychology*, Hiebert and Raphael (1996) put social constructivist perspectives and research on the same plane as behaviorist and cognitivist research deserving of roughly equal space in their review. They noted that they themselves had taken the turn from a strictly cognitive to a sociocultural perspective. They delineate social constructivism as assuming that a) higher mental functions (e.g., reading, writing) derive from social life; b) human action, both social and individual, is mediated by tools and signs; and c) knowledgeable members of the culture assist others in learning. But Hiebert and Raphael stressed that social constructivism was young and still needed to address: a) how literacy is acquired by all students, b) how well socially constructivist oriented methods work in making students successful readers, and c) how single factors such as texts, tests, and teaching can be researched given social constructivism’s
interactionist, holistic perspective. The insinuation seemed to be that researchers might need on occasion to retreat to standard empirical inquiry. In a dualistic universe, as Hiebert and Raphael (1996) discovered, there is nowhere else to go but over to the other side. And then back again.

*Limits of Historical Meta-analyses*

Historical meta-analyses such as these provide helpful narratives about the current situation in reading and literacy education research. Unfortunately, these histories consistently cite only three paradigms: behaviorism, cognitivism, and sociocultural perspectives. The first of these paradigms is defunct, so that leaves only two viable paradigms and such pairing is always problematic. Paired elements tend to repudiate one another, as if the pairing automatically suggested an opposition, possibly a reflex informed by the pervasive tendency toward moralistic polarization in Western religious and cultural idioms (Campbell, 1969b). If there are two stances and one is good, then the other must be bad, or so this assumption all too quickly presumes. Indeed, the Manichean battle of good against evil, darkness against light, life against death, and so on, are central to a host of Western narratives, from fairy tales and fables to myths and religious histories (Campbell, 1969b). Perhaps it is our familiarity with this form that actually requires its motivating presence in our disciplinary narratives (Sarbin, 1998).

Yet these histories sound credible because they reflect what does seem to be a dependable alignment of the various dichotomous arguments along predictable fault lines.
(McKenna, Stahl & Reinking, 1994; Stanovich, 2000). Do the narratives reflect the polarization or foster it? A little of both, perhaps. Reading and literacy theories probably display much greater variety than can be accounted for by only two conceptual frameworks. But the story being told claims as it explains why the entire field of reading is rent along a great divide. Because histories by their nature tell us about what has been rather than what might be, the possibility of more than two current choices rarely gets examined.

*Conceptual Meta-analyses of Reading Models, Theories, and Paradigms*

In contrast to historical meta-analyses, conceptual meta-analyses employ more than two elements/perspectives, and so can avoid knee-jerk dialectic. Stahl and Hayes (1997) provided two conceptual metatheoretical models. Hayes (1997) attempted a general model to give specific models of reading some relational coherence. He condensed the variety in the field to four curricular justifications and orientations to teaching and learning. His four categories were described as Structuralism (concerned with transmission of cultural heritage and explanation of generalizations), Stimulus-Response Connectionism, (concerned with the efficient training of minds and behaviors), Social Constructivism (concerned with social change by engaging students in reflecting and acting on problem solving), and Romantic Naturalism (concerned with facilitating human development). These four perspectives were thought to generally align with
explicit explanation, direct instruction, cognitive apprenticeship, and whole language, respectively.

Stahl (1997), drawing from Garcia and Pearson (1991), identified four instructional perspectives (direct instruction, explicit explanation, cognitive apprenticeship, and whole language), implying an extension of this continuum with references to programmatic approaches (behaviorist basals) and principled eclecticism (a mindful reliance on those methods best suited for any given task).

Basically, each of these approaches is a solution to a different problem in reading. Each approach was originally developed to deal with a specific aspect of reading, and was later extended to encompass the whole of reading instruction. In the process of extension, educators developed a view of reading rooted in their analysis of the original problem. (Stahl, 1997, p. 8)

So, according to Stahl (1997), as an instance, research on decoding leads to an elementalist task analysis which is thought to be applicable to reading overall, and can be understood as related to behaviorist assumptions about investigative methodology. For Stahl, then, the central conceptual constraint inherent in a model would be the problem it was originally constructed to explain, not some vaguely intuited metaphysical metaphor. This would explain the target-directed nature of scientific inquiry.

Then again, Stahl (1997) seems to assume that problems are self-evident, and he downplays the importance of the intuited assumptions that go into identifying a problem
as such in the first place. After all, how could identifying one problem proceed to blind a researcher to other, presumably equally self-evident, problems? For instance, why do whole language advocates not see phonemic awareness as as crucial a problem as do direct instruction advocates? Stahl’s useful problem-solving constraint of model construction does not necessarily contradict Pepper’s analysis of how a problem is identified by way of a metaphysical metaphor. Indeed, because Stahl does not explain how the originating problem being addressed can be effectively extended as a metaphysical assertion about the world (or the phenomena of reading overall), it is hard to imagine how such a categorical error could occur so often without some deeper if less explicit grounding. The two positions are complimentary.

As another example, Cunningham and Fitzgerald (1996) identified five clusters of research methodologies distinguishable by their assumptions about epistemological issues. Most of these clusters, unfortunately, do not qualify as epistemological schools or philosophies in their own right (positivism, hypothetico-deductive inquiry, and so on, are not schools of epistemology). Nor do the authors situate these methodologies in any larger historical or conceptual framework. Their interpretation seems rather sui generis. In any case, Cunningham and Fitzgerald are concerned with methodological paradigms, not epistemological paradigms or metaphysical worldviews. Apparently, practitioners believe in one or another of these approaches simply because they do.
Commeyras (1999) devised a metatheoretical continuum of five descriptors about gender theory to survey literacy educators’ beliefs about gender. These descriptors were gleaned from the extant theoretical positions in the literature, but were not an exhaustive list of all possible positions, nor, according to Commeyras, could they fully capture the diversity of opinions literacy educators had on the questions posed in the survey. Still, Commeyras, like Cunningham and Fitzgerald (1996), demonstrated the value of such conceptual organizers. As a final example, Hruby (2001a) used a three-fold conceptual analysis to make sense of the history of social constructionism (and vice versa) and its employment in reading and literacy research (see chapters 7 and 9 of this dissertation). None of these attempts takes on the entire expanse of epistemological positions in literacy and reading.

Conceptual meta-analyses like these employ more than two perspectives, largely because the relation of two antagonistic opposites is hardly sophisticated enough for an academic construct (even if it does make for an engaging historical narrative). The advantages of this is that a greater variety of potential theoretical positions can more accurately contain the variety of perspectives to be found in the actual field of reading and literacy education. More needs to be said about the need for constraining categories in such analyses, however.
Between Dichotomy and Multiplicity

The great lamented divide in reading and literacy (Dillon, O’Brien & Heilman, 2000; Kamil, 1995; Stanovich, 2000) runs between differences on method (both research and teaching), the relative importance of basic versus applied research, the location of textual meaning (in the text or in linguistic surrounds, versus in the head), favored epistemological grounding, which areas of research foci ought to be central (e.g., internal cognitive processes, strategies, sociocultural factors, equity and justice), and the like. Similar arguments afflicted developmental psychology in the 1950s, 60s, and 70s (e.g., holism versus elementalism, basic vs. applied research, methodological preferences, antecedent-consequent versus structural-functional analysis, continuity versus discontinuity in development, etc.; Lerner, 2002). These, too, consistently aligned along a great divide, nature versus nurture being the chief distinction between them.

In reading and literacy, as elsewhere in educational research, quantitative explanatory research is favored by the mental processes crowd, qualitative descriptive and interpretive research is favored by the cultural processes crowd (Lincoln & Guba, 2000). The one side prefers cognitive constructivist epistemologies, the other social constructivist epistemologies (Raphael & Brock, 1997). Development in reading and literacy, when it is addressed directly, is either described by cognitivists in terms of stages (Alexander & Jetton, 2000; Chall, 1996) reminiscent of Piaget (1932), or by socioculturalists in relation to scaffolding environments (Forman & Cazden, 1994; Moll,
2001) often invoking the theories of Vygotsky (1978). The term *reading education* to signify something focused and precise is preferred by the one group, *literacy education* as signifying something broad and amorphous by the other (D. Alvermann, personal communication, n.d.).

And finally, while the cognitivists (Stanovich, 2000) insist their intentions for the children are as egalitarian and progressive as anyone’s—the sincerity of which I do not doubt—it must be admitted that the instructional and research methods they favor are also supported by a decidedly conservative federal administration willing to use its legislative and financial clout to curtail non-quantitative research for possibly ideological reasons (Allington, 1998). At the same time, in the sociocultural camp, the impact of otherwise excoriating critiques of American injustice and inequity is muted by arguably anachronistic Frankfurt school rhetorical stratagems as mired in the mythic culture wars of the 1960s as is the vitriol of public education’s more conservative critics.

I would suggest that a retreat from theory in order to avoid dichotomous argument is the wrong direction for resolving this situation (cf. Dillon, O’Brien & Heilman, 2000; Stanovich, 2000). One cannot do science without theory, and if theoretical argument and coherence are problematic, addressing rather than turning away from the difficulties is in order. A better alternative to duality might be multiplicity (Stanfield, 1985), and such theoretical diversity was justified by Tierney (1994) as a natural extension of the constructivist turn inaugurated by the cognitive revolution.
The logical extension of proceeding constructively would be to approach each model as a somewhat separate instance of knowledge construction. Just as there are different ways individuals pursue and delineate their models, there are different views of the purposes of models, of the model’s relationship to potential readers, and of the projections of how the model might be generalized or applied.

(p. 1163)

Tierney nonetheless reviewed what he felt were shifts in past and current models of reading that effectively boiled matters down into two sets: past and current, with past models portraying readers as passive and singular in nature, while current models portrayed readers as involved and multiple. Similarly, Raphael and Brock (1997) divide current paradigmatic differences between two postpositivist/behaviorist perspectives: constructivism, “emphasizing intraindividual processes such as how individuals construct knowledge or engage in strategic thinking” (p. 15), and social constructivism, “exploring how individuals come to the values, competencies, and uses related to literacy through their interactions with more knowledgeable others” (p. 15). So one of the unacknowledged drawbacks of supposedly boundless multiplicity is a tendency to make sense of it in terms of dualities anyway.

The only way to avoid such dualities, then, is to employ a metatheoretical analytic framework that requires more than two categories but less than an incomprehensibly boundless number of perspectives, one which can relate the perspectives to one another
with sufficient clarity to allow for conceptual translation and communication. Conceptual meta-analysis has a limited history in reading and literacy (e.g., Commeyras, 1999; Cunningham & Fitzgerald, 1996; Mosenthal, 1999), but it has usually been focused on particular aspects or issues in the field, not on the conceptual landscape of reading and literacy overall. For such a task, we need a more comprehensive approach.

Although appealingly egalitarian, calls for unlimited diversity of paradigmatic assumptions begs the central claim to incommensurability around which the dichotomous distinctions have been drawn in the first place. Donmoyer (1996, 2001) has called this tendency toward special interest group or individual paradigms, each with its own claim to epistemological incommensurability, *paradigm proliferation*. He suggested this must be rejected out of hand if educational research is to continue as a science, as have Stanovich (2000), and others (Dillon, O’Brien & Heilman, 2000; Kamil, 1995; Shulman, 1986).

*Global* paradigms, it has been demonstrated, are the only kind of worldview that can result in incommensurability due to conflicting, metaphysically grounded, epistemological commitments (Kuhn, 1962; Pepper, 1948). This assumption is shared with Lakatos (1978), Overton and Reese (1973), and others. Reading and literacy theories, models, methods, programs, or philosophies that cannot articulate or identify an *explicit* epistemology cannot lay claim to paradigmatic incommensurability. With all due respect, most scholars of reading and literacy—and most scholars outside of philosophy
generally—do not have anything as finely wrought as an epistemology. What they have are general, often vague, epistemological assumptions grounded in their culture’s common sense, or the common sense of their particular discipline. Such assumptions are more often than not rough intimations of what is likely, and I will hold with Pepper that it is an intuited metaphor, or something rather like it, that can be said to constrain such assumptions and thereby occasionally preclude their coherent integration.

**A Pepperian Analysis of Reading and Literacy Educational Research Theory**

To sum up, in reviewing the history of reading and literacy educational research theory, we have found a narrative similar to the one we traced in developmental psychology up to the 1960s. At that time, developmental psychologists had also suffered from numerous theoretical positions that nonetheless aligned dependably into a disciplinary divide. But in the 1970s, the application of metatheoretical analyses gave that field a sense of coherence allowing it to accept multiplicity as such without needing to reduce it to antagonistic dichotomies.

There is no absolute justification for considering the history of developmental psychology to date as a standard of comparison for the distinct progression of reading and literacy education research. As Monaghan and Hartman (2000) have cautioned: “Making straightforward, one-on-one applications of the past to the present can distort the unique dimensions of each event and lead to erroneous conclusions. Even judiciously constructed lessons are no guarantee of what to do or decide in the present” (p. 109).
Citing the poststructural historian Michel Foucault (1972), and the deconstructive textual analyst Jacques Derrida (1976), they add that the ways in which language mediates meaning “casts doubt on language’s ability to represent reality” (Monaghan & Hartman, 2000, p.109). Or as Foucault himself has stated, you cannot solve problems by borrowing solutions from other people at other times (in an interview with Rabinow, 1984).

That having been said, I think the foregoing comparison of the history of developmental psychology with that of reading and literacy education research indicates that there are several intriguing similarities, enough to argue for employing a Pepperian analysis to the conceptual landscape of reading and literacy research. I believe it reasonable to identify cognitive factors orientations in reading and literacy education research as being located somewhere as a mechanistic organicist metaphysical framework, and I believe it is reasonable to locate sociocultural factor orientations somewhere as a mechanistic contextualist metaphysical framework. There is a great deal of variety within each of these camps, and that is to be expected. These frameworks are hybrids, each borrowing a little of this and a little of that from two clashing metaphors. In the case of hybrid frameworks, what gets borrowed and what does not in each particular theory within a family of theories is not constrained by a single central metaphor. Two metaphors are competing within the borrowings, which is what makes these perspectives metaphysically and epistemologically confusing, and this is the source of much argument. But incommensurability due to conflicting epistemological (or intuited
metaphorical) commitments is probably an overstatement. It is too difficult to determine with any clarity just what those commitments might be. So let us consider the cognitive factors folk first as an example of this, then the sociocultural folk second and more briefly. Finally, let us consider what is missing.

*Cognitive Factors in Reading: Mechanistic Organicist Frameworks*

A mechanistic organicist framework is trying to describe reading and readers as a little like a machine, a little like a living organism. In Chapter 2 we reviewed in some detail how a mechanistic and organicist perspectives differed, so the conflicts or clashing of these two metaphors can be imagined. Nonetheless, in developmental psychology, psychoanalytic and psychodynamic perspectives (e.g., Freud, Jung, Erickson, etc.) take exactly this approach. The developing individual is said to possess certain innate architectural constraints or propensities, yet these architectures are usually described in mechanistic ways. So Freud (1964) likened psychic processes to pressures that built up and needed to be released suggesting all of the mechanistic regularity of the laws of thermodynamics. Inspired by Freud, Lorenz (1965), early in his career, actually proposed a hydraulic model of drives, which he later abandoned.

Similarly in cognitive research on reading processes we find acknowledgement of innate architectural constraints (Pinker, 1994), but the architecture itself is described as if it were a machine, in fact, as if it were a computer (Pinker, 1997). This preferred metaphor stems from the heyday of the cognitive revolution incorporating structural
linguistics with computer science models of computation to provide the theoretical bases for experimental psychology on the structure of the mind (Clancey, 1997). Many early cognitivists confused this North American structuralism with Piaget’s research on cognitive structure, and as a result imagined themselves to be organicists, a suitable rhetorical move, as it helped them to claim that their work represented an authentic paradigm shift from the mechanistic frameworks of the behaviorists (Wigfield, Eccles & Pintrich, 1996).

But North American scientific structuralism, true to its dominant empirical epistemology, saw structure as an assemblage of parts amenable to elementalist analysis. The parts were understood in their relation to one another only by way of antecedent-consequent relations. This was the same way behaviorists analyzed the structure of behavior between responding agents and stimuli. Cognitivists simply moved this approach “inside the head” in order to apply it to mental structures (Clancey, 1997). The segue from behaviorism to cognitivism involved the development of the mediated stimulus or dual process model of behavior; $S \rightarrow R$ became $S \rightarrow r_m \rightarrow R$. In this fashion the door was opened for cognitive behaviorism (Fodor, 1975). The causative relations of cognitive models are far more complex than this, but they amount to the same thing by virtue of a more intricate and expanded mediating function. The cognitive processing flow charts are still representative of unidirectional (if at times recursive) antecedent-consequent relations between elements of a structure (Hendriks-Jansen, 1996).
But European structuralism was concerned with structures as historically emergent systems, the whole of which was different than the sum of the parts and that must therefore be understood in their entirety through both antecedent-consequent and structure-function relations. Structure-function relations are not causally unidirectional as antecedent-consequent relations are. Structure-function relations are simultaneously reciprocal in that the parts make possible the whole, but the whole comprises and gives function to the parts. In other words, the means accomplish the ends, but the ends are the reason the means are employed. Such structural relations are ubiquitous in the living world, and thus inform the organicist metaphysic.

Here then we see the influence of two philosophers every bit as important to an organicist world-view as Kant—Leibnitz and Hegal. To an empirical cognitivist focused on antecedent-consequent relation, Hegal’s historicist speculations are teleological, and could in no way factor into cognitive or other mechanistic accounts. And, yet, for European naturalists, these teleological relations were central to understanding living entities. The European developmental assumption drawn from this is: as with history and evolution, so as with development (and, on an even more tightly constrained time scale, so as with learning). This is the resulting “structure” Piaget (1932) was trying to uncover in cognitive development. It is not very similar to what North American cognitivists were (and still are) searching for.
Employment of foundational, nativist architectures in the mind inspired by Kantian epistemology is not a sufficient basis for labeling oneself an organicist. Machines have native architectures, too. Locke himself suggested the innate capacity for reflection was a native means to cogitate sensation. Using a computer as a metaphor for the mind is, of course, a dead giveaway. Computers are machines, and to use a computer to represent human minds is to suggest that minds are symbol processing machines. This is indeed what cognitivists are claiming (Bereiter, 1990). So, by their own account they are working within a mechanistic worldview, not an organicist worldview. The same goes for cognitive educational researchers (e.g., Afflerbach, 1998; Perfetti, 1998; Pintrich, 1994; Van den Broek & Kremer, 2000). Addressing the influence of motivation, affect, and emotion on learning by devising ways to represent such self-regulatory functions as computable symbols (Pintrich, 1994), not only is not an organicist analysis (or contextualist, for that matter), it flies in the face of the current neurobiological research on the development of emotion and affect regulation (Schore, 1994; Siegel, 1999).

Although they are highly sophisticated in their process orientations, it would be a stretch to identify Pintrich (1994), or Stanovich (2000) as an organicist in the same breath as Ceci (1990), or Scarr (1992).

*Sociocultural Factors in Reading: Mechanistic Contextualist Frameworks*

Sociocultural factors folk in reading and literacy education are contextualist mechanics for several reasons. They are concerned with social, cultural, and linguistic
contexts, for instance (Heath, 1991; Moll, 2001). They locate meaning in those contexts, rather than in the individual. Indeed, they distribute the individual’s sense of individual identity across those contexts (Lave, 1990; Moore, 1996). Many are also very concerned with historical processes, especially cultural-historicists such as Heath (1991), as well as Critical Theory-informed researchers (Moll, 2001). The central metaphor for contextualism is the historical event. Change is a crucial category in contextualism, as it is for many sociocultural researchers.

But change is not usually seen as unconstrained, unpredictable, or aimless by these researchers. Rather, there is a dependable and preferable historical progression in play, according to socioculturalists, at least if you get all the factors right. This is because human beings can be brought to certain dependable developmental end points given the right contextual factors. Thus, in some ways, the agent is portrayed as dependably reactive, similar to mechanistic accounts, and the historical processes are, too. The learner is conceived as a little like an historical event, a little like a machine. These approaches are similar to dialectical approaches in developmental psychology which have already been identified as mechanistic contextualist (e.g., Riegel, 1976).

Unexplored Factors in Reading: Contextual Organicist Frameworks

So if Behaviorists are mechanistic, cognitive factors folk mechanistic organicist, and sociocultural factors folk mechanistic contextualist, what is left to explore along the theoretical circle? According to figures 1 and 4 (p. 9 and 205, respectively), the entire
expanses from contextualism through organicism remains to be explored by reading and literacy theorists. As we have already noted, and will note further in the next chapter, this is not wholly unexplored territory. Scholars in many other social science fields have scouted the theoretical parameters these positions suggest and have applied them fruitfully to unanswered questions in psychology, anthropology, linguistics, and philosophy of mind. We might flesh things out a bit by attending to those schools of thought often overlooked in the great reading debates. We could consider Pragmatists and poststructuralists as pure contextualists. Piagetians, and transactional reading folk (i.e., Rosenblatt, 1994) pure organicists. We may also consider whether whole language folk fit in between (they may—we will get to that in Chapter 10). And what of contextual organicist hybrids? Although there is much promising work in developmental psychology in this vein—indeed the central thrust of the recent developmental turn towards theoretical syntheses is centered in it—it has not been a mainstream position in reading and literacy education research theory.

Yet this is precisely the perspective socionaturalism would inhabit. In the next chapter, we shall review some of the fundamental concepts and categories of a contextualist-organicist hybrid theoretical framework.
CHAPTER 4

ON SOCIONATURALISM

Up to this point I have been making an argument on behalf of a third way in reading and literacy education theory. I have drawn from philosophy of science, and the history of developmental psychology, comparing that history to the history of reading and literacy education research. I have noted that Pepper’s theory of world hypotheses proved useful in developmental psychology, and that it might also be helpful as a way to parse the current debates in our own field. I cannot think of anything more to say to convince you that we should entertain the idea of a third epistemologically credible theoretical framework, if I have not succeeded in doing so already. But even if you were to allow that a third credible paradigm in reading and literacy is conceivable, you probably are still unclear as to what it might look like. I have called it the socionaturalist narrative and it seems to be the epistemological opposite of whatever it was that behaviorism was all about (if Figure 1, p. 9, is any guide). Beyond that, its outline is probably uncertain.

In this chapter I wish to sketch out the thematic motifs that distinguish the socionaturalist narrative from the other perspectives around the theoretical circle illustrated in Figure 1 (p. 9). Socionaturalism is a bio-ecological theoretical framework, which is to say it is a contextualist-organicist hybrid world hypothesis. For the socionaturalist, a human being
is a little like a living organism and a little like an historic event. Although it would be
more accurate to say that from the socionaturalist perspective, a human being is a lot like
a living organism and a lot like an historical event—not merely metaphorically speaking,
but quite literally, at least to the best of our scientific knowledge. Human beings are
presumed from the outset to be ecologically-situated, biological entities with a personal,
developmental, and evolutionary history and it is further presumed that this matters
greatly for a socionaturalist interpretation. This central naturalistic assumption is fleshed
out with scientific and theoretical work from current developmental psychology,
philosophy of mind, autonomous agent research in AI, evolutionary psychology, the
various neurosciences, cognitive ethology, situated cognition, adaptive sociolinguistics,
ecological anthropology (either cultural or biological), ecological models of perception,
and current activity theory. In a word, it is informed by and centered in the naturalistic
turn in the social sciences over the past twenty years thanks to a growing body of
theoretical and empirical synthesizes (what Brockman, 1995, called third culture work).
Readers familiar with this turn probably can guess what socionaturalism looks like.

Because of the constrained form of this manuscript (being only half a conceptual
work), a wide-ranging review and synthesis of the new research in the previously listed
fields would be beyond the warrant of this dissertation. So instead I will provide a
thumbnail sketch with enough reference to extant examples of scholarship to assist
readers in pursuing their own detailed investigation into what has been going on in the
academy outside of teacher education. As Schore (1994) noted in his impressively comprehensive synthesis on affect regulation and socio-emotional development:

… an integration of the findings of many related fields is essential to the ultimate creation of a heuristic model of development that can accommodate interdisciplinary data, and can freely shift back and forth between their different levels of analysis…. It is difficult enough to keep up to date within one’s own area of study, let alone to be aware of the newer concepts in related fields. Nevertheless, it is absolutely necessary in light of the current emphasis on multidisciplinary research (p. 6).

In this chapter, then, I will give an introductory definition of socionaturalism, a theoretical framework that employs bio-ecological motifs to re-describe cognitive and sociocultural influences on learning and agency. In order to illustrate the foundational constructs of socionaturalism I will focus on three key concepts: bio-ecological organization, transactive relation, and emergent phenomena. I shall elaborate on the nature of transactive relation and how it allows socionaturalism to provide an integrative narrative of human behavior and development across varying levels of bio-ecological organization without recourse to explanatory reduction.

Socionaturalism and the Investigation of Adolescent Literacy Development

One must never lose what Barbara McClintock called “the feeling for the organism.” It makes no difference at what level one works, whether it be
molecules or ecology or any level in between: all is lost if one forgets that

*Dictyostelium* is an organism. In this way one can keep one’s work in tune with

nature; in this way one can see the all-important connections between all levels of

inquiry. (J. Bonner, personal communication, as reported in Loomis & Insall, 1999).

Socionaturalism (Sinha, 1988) is a theoretical project that attempts to re-describe

higher-order human phenomena (the “socio-“ part) as natural phenomena (the natural part). Unlike sociobiology (Barkow, Cosmides, & Tooby, 1992), socionaturalism does not attempt to explain away social phenomena as merely the accrued result of biologic and genetic processes. Instead, socionaturalism employs bio-ecological motifs to re-narrativize higher-order human phenomena (cognitive development, language, representational systems, social relations, cultural change, etc.) in ways that are coherent with what is currently understood about the dynamics and generative relationships of the natural world across levels of organization. (By “natural world,” socionaturalists are not making an ontological commitment to a privileged view of truth or reality, but merely referring to that realm of living organization known as “nature” as currently entertained in the discourses of the life sciences.)

In this fashion, socionaturalism hopes to avoid the long-standing, ethically weighted dualism of nature vs. society and the many ancillary dualisms to which it is related (flesh versus spirit, brain versus mind, nature versus nurture, reductive mechanism
versus transcendentalist contextualism, the absolute versus the absolutely arbitrary, mother earth versus father sky, etc.). This tradition of dichotomy between the bound and the ethereal can be observed in the paradigmatic incommensurability of cognitive and sociocultural research projects in reading and literacy education, where the opposing narratives informing those research projects predicate a similar opposition. Rather than being forced to choose between the bounded or the ethereal, socionaturalism opts for the grounded, and rather than the dependably interactive or the uniquely inspired causative relation, socionaturalism requires the developmental or transactively emergent relationship.

For application in literacy education research, this means fashioning a naturalistic narrative that can incorporate our interest in the cognitive and sociocultural factors that mediate the literacy behaviors and development of learners and classrooms in such a way as to integrate our understandings of these levels of organization without reducing one to the other and without falling afoul of matching incommensurable paradigms (Kuhn, 1962; Lincoln & Guba, 1985; Pepper, 1948). The central focus is thereby kept on the developing learner, and the learner’s transactive relation with the multivariate ecological surround, not deflected towards the study of inner and outer heuristics for their own sake.

In order to do this, socionaturalism first embraces the naturalistic assumption: that human beings, whatever else they can be described as being, can, with a fair degree of dependability and confidence, be described as being natural entities, which is to say,
bio-ecological organisms. As a result, that which can be described as being human, including our conscious experience of the phenomenal world, our sociality, our semiotic systems, or any other of our cultural appropriations, ought also be thought of as natural phenomena likely demonstrating the same bio-ecological dynamics at play throughout the varying levels of organization in the natural world.

The philosophical implications of such a stance for theories of knowledge, learning, comprehension, and memory, as well as concept formation, symbolic representation, language, consciousness, and identity are profound (Block, Flanagan, & Güzeldre, 1997; Lewis & Granic, 2000). Discussion of these implications is beyond the warrant of this chapter (we shall tackle this in Chapter 10), but the reader should not therefore imagine that they have been swept under the rug. Flanagan (1992) observes:

One important part of the [naturalistic project] has to do with getting clear on whether there are any shared phenomenological features of conscious mental life, whether, that is, there is anything it is like to be a member of our species. In trying to frame an answer to this question, [we should] be somewhat less interested in how exactly things seem for any particular individual than in the overlap among individuals. But this greater interest in the species than in the unique features of the individuals in no way implies that the naturalist doubts that there is something it is like to be each particular one of us. The issue here is simply interest-relative. For obvious reasons, you, your loved ones, and your therapist will be much more
interested in the fine-grained details of exactly how your inner life seems than
will the framer of a general theory of mind (p. 91).

The term bio-ecological is a mnemonic device to remind the reader that biological
organisms always require transactive relation with a probable, supportive, and informing
ecological surround. Biology always implies ecology and vice versa. Indeed, this is true
not only of the relationship between the organism and its ecological surround, but
between any two inter-nested levels of living organization. At each level of transactive
relation there is a level that can be thought of as agent and a higher level that can be
thought of as surround. In the case of the genome, that surround is biochemical; in the
case of the cell, it is cytobiological; in the case of the simple animal, physical and
biological; in the case of humans, also social, linguistic, and cultural; in the case of
communities, political and economic; in the case of cultures, ecosystemic.

Science as Narrative

It should be understood that socionaturalism is a narrative. It is not itself a
program of scientific research, at least not yet. But we have to start somewhere. As we
have already explained in chapters 2, 3, and in the Appendix, all programs of scientific
research draw from or inhabit larger informing conceptual domains variously known as
paradigms (Kuhn, 1962), disciplinary matrices (Kuhn, 1969), conceptual domains
(Shulman, 1986), world hypotheses (Pepper, 1948), or, as I shall call them here, thematic
narratives. These thematic narratives are predicated upon root metaphors (Johnson, 1987;
Lakoff, 1987; Pepper, 1948) and reiterative motifs (Booth, 1983; Burke, 1945) that constrain narrative structure and give it coherence. The terms thematic narrative and motif underscore the idea that scientific and philosophical assertions are forms of human expression subject to the same articulatory dynamics in evidence in all forms of human expression (art, music, dance, religious and secular ritual, language, mathematics, mimicry, drama, technology, architecture, fashion, ideology, and so on).

This follows from the idea that all such acts of expression are the result of and thus reflect the structure of human cognition which is itself narratively constrained (Lynn, et al., 1998; Sarbin, 1998). A motif (from the French for motive) is an element of an act of expression that is repeated, often with variation, to provide coherence and profluence (forward momentum) to that act (Booth, 1983; Burke, 1945). Rhythm in dance and music, and visual pattern in design are general instances. The first four notes of Beethoven’s Fifth Symphony (Van Beethoven, 1994) provide an obvious example of a motif, and the first few bars of that symphony of how reiteration of a motif with mounting variation makes for progression.

As a thematic narrative, socionaturalism draws from current work in the life sciences and the social sciences, particularly the numerous and growing number of syntheses in the life and social sciences known as third culture work (Brockman, 1995). Ecological, bio-ecological, and etho-ecological programs of research, particularly in developmental psychology, are also brought to bear (Bronfenbrenner, 1995; Ceci, 1990;
Ceci, Rosenblum, de Bryun, & Lee, 1997; Gibson, 1991; Pellegrini & Bjorklund, 1998; Schore, 1994; Wachs, 2000) These are employed to inform a heuristic narrative for reading and literacy education research.

For instance, acts of expression as described in the previous paragraph are clearly higher-order social phenomena. Yet a socionaturalist analysis of human forms of expression (forms of text and inter-textuality included) could not help but note that reiteration with variation allowing for progression is also the key dynamic for Darwin’s theory of evolution (Darwin, 1871; Depew & Weber, 1995), the functioning of the body’s auto-immune system (Edelman, 1992), the basis of synaptogenesis, and possibly cortical functioning (Rosenzweig, Breedlove & Leiman, 2002). However, it can also be implicated as the dynamic at work in language change (Pinker, 1994), cognitive development (Dawkins, 1996), the spread of ideas (Stanovich, 2000), and the evolution of textual forms (see Chapter 8). Indeed, philosopher Daniel Dennett (1995) has termed reiteration of a theme with variation allowing for selective adaptation the universal algorithm. Thus, the reiteration of this dynamic in both the life and social sciences, as well as the humanities, invites the socionaturalist narrative.

Socionaturalism would assert that such a complementarity across disciplines is not accidental. All neuro-endocrinologically endowed organisms, including humans, are pattern perceivers (Churchland, 1995). Due to basic biochemical mechanisms, it is variability in the environment that triggers the firing of most neurons; invariance leads to
neuronal habituation (Bear, Connors, & Paradiso, 1996). At a higher order, though not
dissimilar level of organization, pattern and regularity dependably lull and assure us;
novelty and progression provoke and engage us. So, according to socionaturalism, human
expressive forms can be re-narrativized as the appropriation of a particularly useful
physio-biological affordance in the psycho-social surround: the neuro-endocrinological
self-regulation of conspecifics and their natural capacity to be manipulated via patterns of
variance and invariance, conflict and resolution, discord and harmony, in communicative
acts. (The socionaturalist project draws its definition of *communicative act* from ethology
where communication is defined as behavior that expresses the internal states of the
communicating organism and modifies the internal state and behavior of a target
organism, usually conspecific; Hauser, 1996.) And, for humans, these species-specific
communicative means can mediate species-specific sociality, much as the communicative
means of other primates mediate their sociality (Tomasello & Call, 1997), as the
communicative means of single celled organisms such as *Dictyostelium discoideum*
mediate their sociality (Strassmass, Zhu, & Queller, 2000), or as the communicative
means of neurons mediate their collaborative activity (Churchland, 1995).

What this leads us to is a bio-ecological theory of language-as-social grounded in
what we know empirically about actual psychobiological, cognitive processes. Such a
theory, given its emphasis on the transactive relation of living organisms with their
perceived ecological surrounds, is in accord with what we know with a fair degree of
dependability about the natural dynamics of living organization and the nature of animal communication. This leads us toward a definition of communication as coordinated activity—no surprise there, perhaps, but that we arrive to that conclusion by way of biology. In education research, communication is more generally understood as a culturally specific pattern of behavior, utterly arbitrary but for its collective popularity, yet nonetheless largely determinative of thought and behavior (Gee, 1990; for a cognitive critique of this position, see Pinker, 1994).

Life science-informed linguistic anthropologists (e.g., Dunbar, Knight, & Power, 1999), have suggested that human language actually evolved as a species-specific communicative form due to the ecologically-situated need for a more facilitative sociality among early hominids. Though predicated on individual variation, the result over generations for the entire species has been greater facility for adaptive social organization on behalf of a more fruitful and satisfying condition for the species. (The tendency towards the more fruitful and satisfying condition is a possible definition of motivation, even at the cellular level, provided, of course, one redefines satisfaction in non-phenomenological terms.) In this way we can imagine, in highly visceral fashion, how linguistic acts are social due to bio-ecological dynamics.

To put all this in more literacy-friendly terms, patterns and their variation are employed in human expression (such as in texts) to viscerally (emotionally) engage others (such as readers) towards collective behaviors (such as shared experiences). It
would be beyond the scope of this chapter to demonstrate how this dynamic stands as more than an extended analogy, but the point of such a socionaturalist narrative is that neither human communicative reference, nor human sociality are transcendent phenomena. According to socionaturalism, appeal to transcendent forces, either mental or cultural, is an act of philosophical bad faith, and likely fostered by the inadvertent reification of heuristics (Flanagan, 1992).

Be that as it may, socionaturalism recognizes the dangers of reifying its own heuristics as fact, reality, or truth. Socionaturalists do not need to prove that social processes are in fact natural phenomena—whatever that assertion could possibly mean—only that it is conceptually useful to imagine them as being so for heuristic, pedagogic, and professional purposes. Of course, while it is clear that humans are not merely computing machines, nor merely nexuses of historically unique contextual influences—popular tropes in current literacy research—it is the long standing and quite fruitful assumption of the life sciences that humans are literally bio-ecological organisms. Given the impressive advances in the life sciences to mediate and modify the conditions of our lives based on such an assumption, there may be impressive and effective rhetorical value in appropriating this motif for use in the social sciences. An argument can be made on behalf of the greater significatory value of models that are coherent with our scientific if socially constructed understandings of the more-than-human world (Abram, 1996; also see Chapter 9). A narrative articulation gains both rhetorical power
and psychological effectiveness insofar as it is coherent with what we already take to be literally, or at least dependably true (Campbell, 1986; Kuhn, 1962). Whether the narrative itself is literally true is beside the point. Whether it gives rise to useful theoretical assumptions and fruitful research questions is the issue.

Caveat Recap

It is crucially important to attend to an important distinction. Literacy narratives informed by the life sciences are not suggesting that life science research should preempt educational or literacy research. This is a common error in the brain-based and brain-compatible education movements (Bruer, 1999; also see Chapter 5). Only scientific (quantitative and qualitative) research on classrooms and learning can tell us anything scientific about classrooms and learning. But all scientific inquiries are drawn from and presume theoretical frameworks, and research in the life sciences can inform such theory thereby in turn giving rise to novel and promising programs of educational research. To inform theory, however, that life science needs to be mindfully re-narrativized lest the paradigms of the life sciences be smuggled into education research without notice or interrogation. For this is possibly how the narrative of reductive mechanism arrived into educational research from behaviorist and cognitive psychology, and how the narrative of transcendentalist contextualism arrived into educational research from continental philosophy and cultural anthropology.
Both of these current reading/literacy narratives are suited to the purposes to which they are usually put. Socionaturalism is not attempting to displace them. But, as with all such narratives (including socionaturalism), they do have their limitations. The socionaturalist project may offer a mindful re-narrativization to address the theoretical and conceptual lacunae in reading and literacy education research in regard to development. If so, bio-ecologic transaction would not be an unworthy compliment to reductive mechanism and transcendentalist contextualism.

Would We Recognize a Paradigm Shift If We Saw One?

As it turns out, a review of trends in theory and research in the social sciences indicates that similar moves have been increasingly employed in psychology, cognitive science, artificial intelligence research, philosophy of mind, anthropology, and linguistics over the past quarter century. For instance, the revolutionary usurpation of behaviorism by cognitivism is still recounted in glowing terms at literacy education graduate seminars, even as cognitivism in psychology is currently being usurped in turn by a move toward psychobiology, psychopharmacology, and the various neurosciences (Churchland, 1995; Pfeifer & Scheier, 1999; Schore, 1994; Siegel, 1999).

The move in autonomous agent (robotics) research towards a situated model of cognition informed by Gibsonian ecological psychology (Gibson, 1986), comparative ethology (Allen & Bekoff, 1997), cognitive anthropology (Lave & Wegner, 1991), and philosophy of mind (Block, Flanagan, & Güzeldere, 1997) is another example (Brooks,
The impetus here is not theoretical so much as practical: robots based on the old model of an agent with a centralized processor that performs computations on symbolic representations of the agent’s surround has repeatedly failed to negotiate simple but novel environments, something even an earthworm can do (Hendriks-Jansen, 1996). So AI researchers who once helped galvanize the cognitive revolution with the promise of easily parsable symbol processing minds have had to switch to off-loading the symbol processing necessary for computers (but not living organisms) onto the environment itself (Clark, 1997). In biologically grounded organisms, this means the explanatory necessity of non-conscious symbolic processing evaporates all together (Hendriks-Jansen, 1997).

Philosophy of mind provides another example of what that discipline calls the naturalistic turn (Flanagan, 1992). Debates over the symbol grounding problem (how do symbolic representations get their referential meaning in non-programmed computational systems?), the frame problem (how does an autonomous agent update its representation of the environmental surround as it travels through it if it needs that updated representation to do so?), and the determination of natural kinds problem (how do organisms establish pertinent environmental categories from scratch?), have been quelled by the above mentioned demonstrations in AI and the neurosciences (Brooks, 1999; Pfeifer & Scheier, 1999). Even philosophers like Jerry Fodor, the last holdout for symbol processing models of mind (and innate categories to tackle the philosophical dilemmas
they posed), has stepped toward the naturalist camp with *The Mind Doesn’t Work That Way* (Fodor, 2000), a philosophical refutation of Steven Pinker’s mind-as-computer model in *How the Mind Works* (Pinker, 1999).

European philosophers have also been getting into the act in an attempt, to cite the title of a recent edited volume, at *Naturalizing Phenomenology* (Petitot, Varela, Pachoud, & Roy, 1999), a project which must have Husserl, against all odds, livid. Similar moves in anthropology and linguistics conducted under such labels as biological (Bickerton & commentators, 1984; Boaz & Almquist, 1999), ecological (Moran, 1990), biocultural (Goodman & Leatherman, 1998), adaptive (Cronk, Chagnon, & Irons, 2000; Haviland, 2000), and evolutionary (Dunbar, Knight, & Power, 1999) are equally evident. Through most of the 20th century, a battle raged between reductive materialists in physical anthropology, and transcendental idealists in cultural anthropology (Haviland, 2000). Today, in many quarters, physical anthropology is now re-titled biological anthropology, and the traditional trinity of cultural anthropology’s interests—belief systems, social relations, and economics—is now widely augmented by the study of human or cultural ecology (how cultures relate to and are mediated by their ecosystems) (Harris & Johnson, 2000; Haviland, 2000; Kehoe, 1998; Park, 2000). This is not by any means to suggest that everyone in the social sciences is embracing a life science-informed theoretical narrative. But certainly a significant and growing number of scholars in these fields have done so.
Ecophilia, Biophobia

If an author were to propose an ecological theory of literacy development, this proposal would probably muster some hopeful interest within the discipline, and, indeed there have been several such attempts (e.g., Abram, 1996; Davis, Sumara, Luce-Kapler, 2000; Guthrie & Wigfield, 2000; Pearson and Raphael, 1999; Sumara, 2000; Weaver, 1994). But were the same author to suggest a biological theory of reading, the discipline would probably be highly dubious if not strenuously dismissive (e.g., Coles 2000). This is odd because biology and ecology study the exact same thing: the nature of living organization. The convention of distinguishing between biology as that which occurs at the level of the body inward, and ecology as that which occurs at the level of the body outward, is merely an historical convention grounded in our human tendency to privilege our multicellularity as the center of the natural universe. More importantly to socionaturalists, the organizational dynamics that distinguish the organic from the merely mechanical or contextual are similar across the bio-ecological spectrum (Kauffman, 1995; Thelen & Smith, 1994).

The imbalance in pedestrian attitudes about biology and ecology can thus not be accounted for by any conceptual distinction between the two sciences. Rather, it would seem, what is being reflected is an unease with the body and a privileging of external (and thus potentially authoritarian) influences. Long-standing religious themes in Western culture, and more current historical critiques support this unease and distrust
with our biology, our bodies, our pleasures, our mortal selves. Too, a bias for contextual effects over cognitive structures in learning in the reading and literacy field may be borrowing an inappropriate ecological/biological distinction as a metaphor. Echoes of the nature/nurture debate, with a decided bias in favor of nurture, may also be informing this distinction. (It is not difficult to understand why educators would favor nurture, as it is what educators do. There is nothing more disempowering for a teacher than an uncooperative nature. But as we have already reviewed in Chapter 2, this debate is an anachronism.) It would be beyond the scope of this chapter to explore the many rationales for what amounts to biophobia, although such an analysis would certainly be of interest. What can be said here is that the ethical dualism that casts biology as “bad” nature as opposed to ecology (and other contexts) as “good” nature is not supportable as a thematic narrative by current life science. And an older, less enlightened cultural duality that cast all nature as suffering of the spirit, ecclesiastical repudiation of gnosticism not withstanding, may continue to haunt us in our current disregard of the environment and its resultant and dangerous degradation.

Transaction

Being biological necessarily implies a transactive relationship with an ecological surround, not merely an interactive one (Dewey & Bentley, 1949). Unlike interaction, transaction is not a set of linear relationships between an organism and its surrounds as if agent and environment were discrete entities at the same level of organization. Rather, a
transactive relationship *includes, defines, and gives mutual viability* to two proximal levels of organization. Thus an entity and its context are in transaction. And this is true not only at a given point in time, as would an interaction be, but over time, both developmentally and evolutionarily. The contextual surround need not be emply physical or biological, it can also be psychosocial, cultural, or linguistic. For socionaturalism, the same dynamics of negotiating ecological surrounds could be expected in each of these. The linguistic surround would include texts, thus, a reader and a text are in transactive relation. This idea was taken up by Louise Rosenblatt (1994) and provided the inspiration for her transactional theory of reading. It is unfortunate, if understandable, that many scholars of language education who embraced Rosenblatt’s ideas failed to pursue her reference to Dewey and’s work of epistemology. On the other hand, they might have been shocked at the many references in that work to “the organism,” meaning, for the most part, human beings.

Our position is simply that since man as an organism has evolved among other organisms in an evolution called “natural,” we are willing under hypothesis to treat all of his behavings, including his most advanced knowings, as activities not of himself alone, nor even as primarily his, but as processes of the full situation of organism-environment; and to take this full situation as one which is before us within the knowings, as well as being the situation in which the knowings themselves arise” (Dewey & Bentley, 1949, p. 104).
Dewey and Bentley are not here using “environment” merely as a synonym for “social context.” As the pioneering ethologist Niko Tinbergen (1963) would point out fourteen years later, cognitive predispositions (how it is to be like a particular species of organism in that species’ particular world, or *Umwelt*) and behavior were the result not only of the organism’s structure, but also of its functions, its development and its evolution. Thus, all organisms, including human beings, are not in their world, but *of* their world, as is our uniquely human capacity for species-specific categorization, comprehension, perception, and memory. Suggesting, of course—and this is Dewey and Bentley’s point—that the world is also of us. A transactive relationship, that.

The concept of transaction certainly has implications for cognitive development and for reading theory as well (e.g., Biddell & Fischer, 1997; Goodman, 1994). But it should be noted that, many developmental psychobiologists (e.g., Michel & Moore, 1995), ethologists (e.g., Allen & Bekoff, 1997), and ecological psychologists (e.g., Reed, 1996) use the term *interaction* in the sense that Dewey and Rosenblatt used *transaction*. These life science-informed social scientists can afford to retain this expanded use of the term interaction because the likelihood of confusion with naïve interactionism in their field is now slim. The dynamics of transactional relation are that well ingrained in most of the life sciences (biochemistry being a notable exception; Harold, 2000).

The use of the term interaction in reading, however, tends to indicate the more linear model, and often transaction is similarly used (e.g., Tierney & Shanahan, 1991).
For current purposes in reading and literacy education research, it would probably be better to maintain a distinction between interaction and transaction. A simple comparison chart may clarify the differences between them (See Figure 3, p 101). I also propose that for the study of human behavior in culturally structured learning environments such as our schools, including learning and literacy behavior, Tinbergen’s four causes ought to be complemented by two more: phenomeno-linguistic, and cultural-historical. Although Tinbergen’s, immediate, functional, developmental, and evolutionary causes are adequate for the study of animal morphology and behavior (and thus equally useful for studying the morphology and behavior of humans), it fails to address two uniquely human causes of behavior. One is our conscious awareness as the locus of the self, a montage of qualic sensation dependably representative of environmental and somatic-emotional states, linguistically mediated and sharable. The other is the cultural heritage of beliefs and values into which we are born and within which we are socialized. Although transcendentalist theorists may have give these causes too much responsibility for human behavior, it would be unjustifiable to ignore them.

Emergence

The concept of emergence in inter-nested levels of dynamic organization, or bio-ecologic transaction, is a tricky one. The term is used in widely different ways even within non-linear dynamic systems theory from which it has, appropriately enough,
**Figure 3. Interaction versus Transaction**

<table>
<thead>
<tr>
<th>Interaction</th>
<th>Transaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanistic</td>
<td>Organic</td>
</tr>
<tr>
<td>Linear relations</td>
<td>Recursive relations</td>
</tr>
<tr>
<td>Sum of parts equals whole</td>
<td>Whole greater than sum of parts</td>
</tr>
<tr>
<td>Antecedent-consequent causation</td>
<td>Structural-functional causation</td>
</tr>
<tr>
<td>Reductive analysis</td>
<td>Dynamical analysis</td>
</tr>
<tr>
<td>Level field or Russian Doll structure</td>
<td>Multiple levels in evolved relation</td>
</tr>
<tr>
<td>Static</td>
<td>Emergent</td>
</tr>
<tr>
<td>Organism in environment</td>
<td>Organism of environments</td>
</tr>
<tr>
<td>Environment is constraining</td>
<td>Environment is probable, implicit,</td>
</tr>
<tr>
<td>or deterministic</td>
<td>and informative</td>
</tr>
<tr>
<td>Agency requires external motivation</td>
<td>Agency is inherent, distributed, and proactive</td>
</tr>
<tr>
<td>Reiterative</td>
<td>Generative</td>
</tr>
<tr>
<td>Interactive system</td>
<td>Transactive system</td>
</tr>
</tbody>
</table>
emerged (Thelen & Smith, 1994). For some, emergence is a special case of reductive explanation, one with limited predictive power (Clark, 1997). For others, emergence, or supervenience, is the way in which a critical mass of lower level phenomena can give rise to higher order phenomena which then self-organizes the lower level phenomena unpredictably (Marion, 1999). For still others, particularly poststructuralists, emergent phenomena are simply inexplicable, thwarting the controlling imperative of modern science (Cilliers, 1998).

For socionaturalists, emergence is the simultaneous development or evolution of form and function within a transactive relation between two inter-nested levels of living organization. The interdependence of organism and surround, of genome and cell, of culture and ecosystem, and of communicative form and recipient are all examples of this relation; the first three examples would give rise to the emergence of agency, while the last would give rise to the emergence of meaning—possibly suggesting that agency and meaningfulness are not as distinct as we might have believed (cf. Millikan, 1984; Reed, 1996). Emergence does not allow for reductive explanations of dynamic systems with any predictive value, but neither does emergence imply transcendence. (There are several good books on dynamical systems in various social sciences applications, but three edited book chapters are a good starting point for the beginner interested in applying emergence to learning, development, emotion, and identity: Freeman, 2000; Schore, 2000; Van Geert, 2001.)
Take as an example a genome and the cell in which it is located. A genome cannot create a cell. It takes a cell to create other cells. This is because the structure of the mother cell templates the structure of the daughter cells. But the cell’s structure requires its parts, and certainly its genome, in order to replicate. But on the other hand, the genome requires location within a functioning cell with all of its other parts in order to do what it does. This relation can only be understood causatively if mapped over time. Genome and cell (or multi-cellular organism) have evolved together over vast expanses of time in a transactional relation which iterates beyond the genome and cell to the entire organism and the organism’s species-probable environment. Such a time-factored causative relationship requires structural-functional as well as antecedent-consequent explanations, as we explained in the previous chapter.

This capacity for reiteration with variation in a proactive search for adaptability is what allows living organizational forms to defy the second law of thermodynamics—the cosmological trend toward entropy—and what distinguishes actual living organisms from machines (often employed as tropes in cognitive narratives of mental processes). Agency is an inherent part of such a relationship. What appears to be a “will” or proactivity in the level of living organization under investigation (the cell, say), is in fact a distributed process of emergent self-organization across levels (genome, cell constituents, cell, cellular environment). The same observation can be made of humans, and this gets tricky because such an observation seriously challenges our assumptions about will, agency,
mind, and consciousness being the source, director, or cause of our behavior. Rather, mind and consciousness are possibly the emergent result of our behavior which is actually caused by its transactive, developed and evolved relations with a transactive, developed and evolved surround. Notwithstanding my will to develop this idea further, to do so would again be beyond the scope of this chapter.

However, let me at least warn against overstatement of this insight. However leery I may be about the idea of reified minds (e.g., Fodor, 2000), I do not mean to suggest that our conscious experience is epiphenomenal. Our sense of awareness, identity and agency are all actively in play in mediating our behavior. But there is more to the generation of our behavior than meets our mind’s eye, otherwise, it would be a lot easier to teach children to read. Our assumptions about the central importance in behavior of conscious, linguistically mediated, cognitive or metacognitive thought are possibly overstressed and much too simple. The behavior of living organisms is much more complex than we have acknowledged in reading and literacy education. Socionaturalism leads us toward some of that complexity.

Second Recap

Again, a biological organism is always in transactive relation with its ecological surround, a surround the organism is not merely in, but of—structurally, functionally, developmentally, and evolutionarily (Tinbergen, 1963). This is true not only of multicellular organisms like ourselves, but of all levels of living organization, from the
genome to the cell, to the visceral sub-systems, to the psycho-social surround of human communities, to a community’s situated relationship within a particular ecological niche, the niche within the ecosystem, and the ecosystem as part of the entire living earth itself (Lovelock, 1987). Similarly, cognitive, phenomenological, semiotic and sociocultural phenomena, their dynamics and relations, are all grounded within such transactive relations with higher- and lower-order constraints and affordances. Acknowledging this, a socionaturalist framework avoids both the reductive mechanism of cognitive models and the transcendentalist contextualism of sociocultural models, as well as their mutual incompatibility as heuristics. It offers instead a more inclusive and integrative narrative of meaningful activity (the appropriation of culturally significant representational forms) grounded in an understanding of bio-ecological dynamics and transactive relation.

*The Nature, if not the Meaning, of Life*

In this chapter I have attempted to describe several of the concepts and issues related to the socionaturalist project, bio-ecologic transaction being chief among them. It would be useful, if I had the space and time, to give illustrative examples of how bio-ecologic transaction plays out between genome and cell, between single celled organisms that demonstrate patterns of sociality during times of stress, between the transactive relation of the nervous and endocrine systems in mammals and how this serves as a suite of self-regulatory processes between the organism and its environment, between the imagined, narrativized self and the psycho-social surround, and between readers and
texts, howsoever reading may be defined. Even, how the sociocultural realm is itself in relation, whether it acknowledges it or not, with the more-than-human or ecosystemic surround.

I have claimed that the socionaturalist project as applied to reading and literacy education is a life and social science-informed narrative that can provide the foundation for a naturalistic theory of communicative acts, language, texts, and other representational systems, as Sinha (1988) originally attempted. Such a theory will not displace cognitive and sociocultural theories, but will compliment and inform them. As Flanagan (1992) noted:

Any *a priori* decision about what line of analysis “gets things right” or “has the last word” prejudges the question of whether different analyses might be legitimate for different explanatory purposes and thus compatible with each other, or at least capable of peaceful coexistence. As theory develops, analyses at each level are subject to refinement, revision, or rejection (p. 11).

While socionaturalism is a far cry from thinking of literacy education as a life science, it suggests that we might begin to re-imagine literacy in all of its manifestations, cognitive, affective, psychosocial, and cultural-historical, as living process. Moving us in that direction is what the socionaturalist narrative is all about. In the next five chapters you will see how it has slipped into and woven its way through my few published scholarly writings over the past four years.
CHAPTER 5

COGNITION AND THE MIND


If you will excuse the strained metaphor, when it comes to learning and comprehension, the brain is clearly at the heart of the matter, and so the connection between brain/mind research and educational practice may seem an obvious one. In Teaching with the Brain in Mind, Eric Jensen is eager to demonstrate the connection and attempts to show how research on the brain places education "on the verge of a revolution" (p.1). Unfortunately, upon careful consideration Jensen's text stands rather as a case study of how the enthusiasm for education reform - this time promoted under the mantle of "brain science" - can run away with itself.

Brain in Mind was written to acquaint teachers, administrators and parents with both the fundamentals and the current research on brain processes, as well as on their

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implications for teaching practice. At 133 pages - index, references, glossary, and notes on resources and the author included - the text can best be described as succinct. The magazine-sized paperback is attractively laid out and composed for ease of reading. The writing is clear to the point of simplicity, and the illustrations, though numerous, are generally more ornamental than informative. Daunting it is not. However, brain science is not home gardening, and brevity, in this instance, appears to be the soul of obscurantism.

If Jensen's treatment is sketchy, his range is comprehensive. In the course of eleven chapters he traces the fundamental findings of brain and learning research. Each chapter starts with a thumbnail review of select citations, then quickly moves towards implications for the classroom. Most chapters conclude their topic with "practical suggestions" for teachers. Jensen, a former teacher himself, gets off to a rocky start, however, when he goes out of his way to dismiss "theory" and academic inquiry. This seems odd considering the crucial role theory plays in scientific research methodology - in the formulation of research questions, for instance. Such theoretically grounded scientific research is responsible for the very brain science Jensen cherishes. Moreover, the discerning reader may find Jensen's aversion to the academy ironic given the neuroscientific and cognitivist work he cites, most of which has come out of the academy. Thus, the "practical strategy" section of Chapter 1 baldly suggests that teachers themselves should learn about brain science, apply this knowledge to their classroom observations, and share their observations with the general public. Yet Jensen fails to
explain what source will allow teachers to achieve the first, in what manner they can credibly do the second, or through which conduit they are to accomplish the third.

Chapter 2 reviews the brain's physiology and chemistry in five and-a-half pages, and then tries to explain how learning occurs as a result. Unexplicated statements like "Learning changes the brain because it can rewire itself with each new stimulation, experience, and behavior," (p.13) are dismaying. Other paragraphs brim with enough cascading information to confuse a neurochemist. But the chief problem with Chapter 2, and it is one that haunts the entire text and, indeed, the brain-based education movement, is the notion that dendritic density is the cause of intelligence and learning ability. "The key to getting smarter is growing more synaptic connections between brain cells and not losing existing connections. It's the connections that allow us to solve problems and figure things out," claims Jensen (15). Unfortunately, there is not enough evidence in the extant literature to support such an assertion as inarguable fact, and even some evidence to the contrary (some of it indicating that our greatest dendritic density may be at age 18 months).

Even if the density assumption held up, it does not follow logically, nor is there any evidence to support the notion, that we can engineer geniuses, as Jensen suggests in Chapters 3 and 4, through "enriched" environments and brain-based teaching. His is a heartfelt hope, but the countervailing influence of psychobiological development on brain structure and the probable propensity of the infant brain to find any natural environment
as opposed to contrived laboratory ones) formatively "rich" are considerations that undermine the "enriched environments = high dendritic density = greater intelligence" claim.

Chapters 5 through 11 respectively treat attention, stress, motivation and rewards, learning and emotions, movement and learning, the creation of meaning, and memory and recall. Alas, while subsequent chapters do build upon and fill in Jensen's initial outline of brain science, they do so without care, particularly when drawing conclusions. For instance, in Chapter 6, where Jensen treats the effects of stress on learning, he fails to distinguish between chronic stress (the focus of many of the studies he cites) and intermittent classroom anxiety. Garden variety "stress" is a normal neuroendocrinological response to challenges, as Jensen notes. But chronic stress is a self-sustaining pathology wherein the body's normal stress response feed-back mechanism habituates and thus fails to re-regulate the sympathetic system. The result is continuously high cortico-steroid levels even without external stressors; this state correlates to a host of maladies from heart disease to depression and, as recent studies on tree shrews and primates have demonstrated, the apical dendritic atrophy of pyramidal neurons in the hypothalamus, the part of the telencephalon central to learning and memory.

Although Jensen's recommendations for dealing with students suffering from stress, trauma, and learned helplessness are humane, there is little compelling evidence environmental factors will reset glutocortisone levels in the chronically stressed. In any
event, biological conditions require the diagnoses and interventions of medical professionals, not the guesstimations of brain-aware teachers. (Imagine the potential law suits.)

Undoubtedly well intended, Jensen's book demonstrates many of the common failings noted of brain-based education by its critics: confusing the brain and the mind; confusing neuroscience (physio-chemical based) and cognitive science (behavior based); assuming unproblematic transfer of findings on animals to humans; interpreting correlation as causation; prematurely claiming as fact conjectures and hypotheses; and, most of all, drawing unwarranted conclusions about teaching practice from this empirical yet speculative research.

Happily, Jensen's chapter-ending recommendations are applaudable: classrooms should be intellectually stimulating environments; instructors should leaven the school day with appropriate amounts of novelty; students should not be malnourished; students should get adequate physical exercise; students should not be stressed or humiliated; students should be able to get a drink of water when they are thirsty; and so on. Such "practical strategies" are without controversy. Most of us would think of them as common sense. Yet any mindful teacher can recognize that such "strategies," while long on sense, are short on infrastructural particulars. Such superficial advice fails to acknowledge the many reasons why poor teaching often takes place, or note that the interventions of good teachers do not always insure student success.
In the end, Jensen's brain-based revolution is founded on his failure to give credit where it is due. There is nothing revolutionary about the academically advocated proscriptions he reiterates such as teaching to a child's developmental level, generating effective learning through activity, engaging students in affectively meaningful cooperative learning, or recognizing that learning is a social process. While current neuroscience research does not contradict the fundamentals of sound pedagogy, it would be disingenuous to suggest, as Jensen does, that it has just discovered them.

It may be hoped that both the current coalescing of the neurosciences and the naturalistic turn in philosophy of mind bode well for an eventual neo-naturalistic framework for educational research. It is distressing, therefore, to see the hasty appropriation of the "brain science" label on behalf of a chimerical "revolution." For those seriously interested in an introductory review of current brain (neuroscientific) research, the following titles selected from a breadth of perspectives will prove helpful. All are written for the educated general reader by highly respected researchers. None suggest the possibility of a quick fix for education.

*Suggested Readings:*


Churchland, P. M. (1995). *The engine of reason, the seat of the soul: A philosophical*
journey into the brain. Cambridge, MA: MIT Press.


While reading “Knowledge, Self-Regulation, and the Brain-Mind Cycle of Reflection” (Iran-Nejad, in press this issue), I was repeatedly reminded of the work of the ecological and perceptual psychologist James Gibson (1966, 1986). This is not as peripheral an observation as it might at first seem as Gibson’s work has been much on the minds and tongues of educational researchers recently (e.g., Wertsch, 1999). Being a researcher in reading education myself, I have for some time been interested in the affordances inherent in an ecological theory of learning and knowledge (Hruby, 1999a). So allow me to review some of the parallels.

Iran-Nejad uses the demands of driving an automobile to illustrate how the nervous system functions as an intuitive figure-ground navigation system. Driving is precisely the navigational conundrum which initially inspired Gibson’s perceptual research in the 1930s (Gibson and Crooks, 1938). The gestalt figure-ground trope is

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central to Iran-Nejad’s theory of self-regulation; Gibson himself was much influenced by Kurt Koffka whom he met while both were teaching at Smith College (Reed, 1988). Gestalt psychology’s perceptual alternative to Helmholtz’s concept of internal processing of sensory inputs likely influenced Gibson’s ecological approach to perception (Reed, 1988). And Gibson (1966, 1986) made use of the figure-ground distinction as the basis for his oppositional pairings between permanence and change perceived in the environment, and between invariance and disruption of the optical array (Gibson, 1966, 1979/1986).

More substantially, Iran-Nejad’s distinction between thematic and categorical knowledge (though more finely discriminated) seems strikingly parallel to Gibson’s distinction between perception of the environment and recognition of things and sets (which Neisser [1993] has playfully described as “where” and “what” systems). On the basis of this, Gibson was able to address the symbol grounding problem by distinguishing between what he termed tacit knowledge (from perceiving information in the ecological surround directly) and explicit knowledge (represented indirectly through symbolic communication systems). Thus, symbols get grounding because “perception precedes predicating” (Gibson, 1986, p. 260), the gist of which is shared by Iran-Nejad’s biofunctional theory (see below). So Iran-Nejad’s use of the term “direct representation” calls to mind unbidden Gibson’s controversial notion of “direct perception” (Gibson, 1979/86). There are important differences, but let us first explore some of the similarities.
Gibson, like Iran-Nejad, rejected outright the idea of the mind as a storage-retrieval system and rejected the ubiquitous conduit metaphor. Instead, somewhat like Iran-Nejad, Gibson maintained that animals, as a matter of evolutionary necessity, had evolved the capacity to make direct use of the information provided by their environment as presented at any given point by way of the surrounding optical array. As Gibson explained in *The Ecological Approach to Visual Perception* (1979/1986):

> Words and pictures convey information, carry it, or transmit it, but the information in the sea of energy around each of us, luminous or mechanical or chemical energy, is not conveyed. It is simply there. The assumption that information can be transmitted and the assumption that it can be stored are appropriate for the theory of communication, [but] not for the theory of perception. (p. 242)

For Gibson there is no communication necessary in perception because there is no space across which to communicate; the organism and its environment (or the perceptual array it emanates) are continuous and complementary, hence perception is “direct.” The “information” available to the perceptual systems (Gibson’s term for the senses) was not the same as that postulated by cognitivists for mental processing, and this distinction allowed for Gibson’s theory of ecological self-regulation.

> [In ecological psychology] information is conceived as available in the ambient energy flux, not as signals in a bundle of nerve fibers. It is information about both
the persisting and the changing features of the environment together. Moreover, information about the observer and his movements is available, so that self-awareness accompanies perceptual awareness. (Gibson, 1986, p. 263)

According to information pickup theory, information does not have to be stored in memory because it is always available. (p. 250)

There are sound evolutionary reasons for conceptualizing an organism’s navigational system this way. As Iran-Nejad and colleagues have noted elsewhere, “the brain’s evolution-tested biofunctional processes evolved as survival solutions to figure-ground (FG) problems…” (Iran-Nejad, Marsh, and Clements, 1992, p. 474). The neuron itself does not merely respond to stimuli, but to variance in stimuli (otherwise, it quickly habituates). Neurons in congress, as in the retina of the eye, organize in levels of center-surround arrays that further particularize this phenomenon, allowing the brain to respond directly to the permanence and variance of evolutionarily meaningful distinctions in the environment.

While more complex theories of the cognitive processing of internal representations to regulate behavior may seem appropriate for the mighty human intellect, they sure seem a rather fanciful way to explain the behavior of a sea squirt, a salamander, or a squirrel (Cairns-Smith, 1996). In truth, they are perhaps even unlikely explanations for much human behavior as it is difficult to imagine how evolutionary
pressures would ever have generated such complex, rigid, and indirect structures to replace simpler, more adaptive, and more direct processes which had the added virtue of being time-tested and perfectly serviceable. So the human capacity for conscious symbolic representation and manipulation is not, as Iran-Nejad notes, an appropriate model for conceptualizing non-conscious brain functioning. The more fundamental processes of the brain (which consumes the lion’s share of its attention) require more visceral and environmentally responsive models.

If Gibson’s theory of direct perception intimates the need for such visceral and ecological models, it does not actually provide them. Although Iran-Nejad’s biofunctional theory does provide such a model, it has little to say about how such processes connect with the organism’s ecological surround. This is, I believe, a complementary distinction between the two perspectives, and one worthy of further consideration.

Although Gibson’s theory seems biologically credible, Gibson himself was uninterested in the neurological substrate and likely underestimated its complexity (Marr, 1982). As Neisser (1993) points out: “Because Gibson cared little for the study of the brain—and because he insisted on using the term ‘direct perception’ to describe the pickup of information from the optic array—it is often assumed that the ecological approach is incompatible with neuroscience. That assumption is quite unjustified…. The ecological approach does suggest, however, that we are unlikely to understand the
workings of the brain… without first having some idea of the task it must accomplish” (p. 158). According to ecological psychologist Edward Reed, “for ecological psychology, the study of psychological processes is a study of functional adjustment to the environment, in which input and output are not meaningfully separable” (1996, p. 65, emphasis in the original). It is precisely this neurological lacunae that Iran-Nejad’s biofunctional theory cohesively addresses.

An important difference (one of many) between Gibson’s ecological psychology and Iran-Nejad’s biofunctional theory is in localization of knowledge. While ecological psychologists seem focused on the complementary interaction of organism and environment, the biofunctional theory is focused on the nervous system and the mental processes that emerge from it. While Gibson claims an organism’s tacit knowledge derives from direct perception of environmental information in the sensory array, Iran-Nejad maps this knowledge onto an inner landscape, an “internal ground.” Indeed, aside from a few vague allusions, this inner ground seems the deepest grounding possible for symbols in Iran-Nejad’s model. In effect, he has moved Gibson’s directly perceived environment indoors as a non-representational wholetheme. From this emerges direct and indirect representations which are analogous to Gibson’s tacit and explicit knowledge. So, to recap, Gibson’s “direct perception,” which is a process of information pickup from the ambient sensory surround, is quite different from Iran-Nejad’s “direct representation,”
which is comprised of non-symbolic sensory images derived from a wholetheme itself presumably the result of perception, direct of otherwise.

This difference can be somewhat narrowed, however, once the special meanings Gibson attached to “perception,” “information,” and “environment” are acknowledged. Perceptions are not necessarily conscious, and according to Gibson (1986), “The environment of animals and men is what they perceive. The environment is not the same as the physical world, if one means by that the world described by physics” (p. 15, emphasis added). Presuming perception and knowledge require neurological activity of some sort, this would seem to move Gibson’s “environment” and the organism’s tacit knowledge of it nearer Iran-Nejad’s “internal ground” and direct representation. In both cases, the purpose is to facilitate the organism’s self-regulation, presumably both internal and external. As Iran-Nejad notes, “The brain’s figure-ground system may be described from many different viewpoints” (Iran-Nejad, 2001, p. 73).

Be that as it may, Gibson’s ideas do not extend well to developed theories of cognition, culture, and learning (although see Johnston and Pietrewicz, 1985, and Reed, 1996). His is a theory of perception which has implications for cognition, but does not displace the need for a theory of cognition. As Gibson noted, “The ecological theory of direct perception cannot stand by itself. It implies a new theory of cognition in general” (1986, p. 263). For Reed, the theory of mind that direct perception implies is one where,
cognition is a life process, not a mechanism. It is dynamic, not static. It is a suite of functions and processes, not a hierarchical system…. From the ecological point of view, in which knowing is not separated from living, cognition might best be defined as an animal’s capacity to keep in touch with its surroundings… This capacity is everywhere subject to perceptual learning…. In the case of human beings, perceptual learning is often a collective process, not a solitary one. (Reed, 1996, p. 169)

To his credit Reed acknowledges recent moves in anthropology and sociology to preserve personal agency against the reification of overly abstract conceptions of culture. He references anthropologist Michael Carrithers who has noted that “Individuals in relationships, and the integrative character of social life, are slightly more important, more real, than those things we designate as culture. According to the culture theory, people do things because of their culture; on the sociality theory, people do things with, to, and in respect of each other, using means that we can describe, if we wish to, as cultural” (1992, p. 35). Such moves have begun to temper sociocultural discourse in education, as witness Wertsch’s (1998) theory of mediated action. (Indeed, at an annual meeting of the American Educational Research Association, Wertsch [1999] devoted a considerable portion of his invited address to discussing the implications of Gibson’s theory of affordances for educational research!)
But is a demonstration of knowledge the same thing as knowledge itself? Is the enacted evidence of understanding the same thing as understanding? This is a question which haunts the periphery of theories of situated and distributed cognition currently piquing the interest of many educational researchers (Anderson, Reder, and Simon, 1996, 1997; Cobb and Bowers, 1999; Cole, Engeström, and Vasquez, 1997; Greeno, 1997; Kirshner and Whitson, 1997, 1998; Lave and Wegner, 1991). Reed himself connects many of Gibson’s concepts to the situativist work on apprenticeship of Lave (1990) and others in this vein. But he is quick to note ecological psychology’s extension of these ideas to explain the apparent internalization of social practices, “The appropriation of cultural activities rests on the ability to see things for oneself” (Reed, 1996, p. 181, emphasis added).

Given the current need among socioculturally inspired educational researchers for conceptual tools that can move their work beyond mere ethnographic anecdote or theoretic solipsism, the allure of Gibson’s thinking is not surprising. Yet, ecological psychology is not sufficient in itself to explain knowledge and knowing. While reasonable people can argue with the emphases of traditional cognitivist research models, any comprehensive theory of knowledge and understanding must be able to make integrative use of the critical mass of empirical research accruing in psychobiology and the neurosciences. This is precisely why I find Iran-Nejad’s work so exciting. The biofunctional theory of knowledge and learning provides a conceptual structure with
which to connect a biologically coherent explanation of cognition with an ethologically rich description of human behavior. Moreover, it is precisely along such a connection that I predict the bridging between the neurosciences and education (Hruby, 1999a, 1999b), a bridge others have dismissed as at best premature (Bruer, 1997).

Perhaps knowledge and understanding are not about the mechanics of data processing, but about the organic development of epigenetic, ontogenetic, and phylogenetic adaptations to an ecological surround (Bidell and Fischer, 1997; Hendriks-Jansen, 1996; Michel and Moore, 1995). Perhaps knowledge is not about the algebraic manipulation of representations, but about the meaningfulness inherent in the organism’s relationship to its perceived world (Bruner, 1990; Clancey, 1997; Neisser, 1993). But an understanding of understanding, as Iran-Nejad suggests, requires a disciplinarily integrative approach that is “wholetheme” in nature, that relates, in other words, to the many aspects of our perceived ecological surround—a surround at once physical, biological, psychosocial, cultural, linguistic, personal, sensory and symbolic.
CHAPTER 7

SOCIOLOGICAL, POSTMODERN, AND NEW REALISM PERSPECTIVES IN SOCIAL
CONSTRUCTIONISM:

IMPLICATIONS FOR LITERACY RESEARCH³

With increasing prevalence, the term *social constructionism* is cropping up at
literacy conferences, around graduate seminar tables, and during informal conversations
between literacy researchers and theorists. But just what this term means, or should mean,
in literacy education research, and whether it is of any disciplinary value is not at all
clear. *Constructivism*, a related term, seems reasonably well understood as a theory or set
of theories about how individuals fashion or structure knowledge rather than receive it
pipe-line fashion, all of a piece (Spivey, 1997). *Cognitive* constructivism, often
associated with the work of Jean Piaget (1932) as well as with more recent research from
cognitive psychology (Anderson, 1995; Kintsch, 1998; Zwaan & Graesser, 1998),
focuses on how these processes occur either metacognitively or unconsciously. *Social

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constructivism (Bruner, 1986), which is generally understood to include Soviet activity theory (e.g., Vygotsky, 1978), pays more attention to the social scaffolds and frameworks that promote the fashioning of such internal structures in a manner reasonably cohesive with an individual’s social surround (Schwandt, 1994; Spivey, 1997). But what, then, is social constructionism?

This question is an important one, I believe, because a reasonable case can be made that there is potential value in a well—if multiply—defined social constructionist framework for literacy education research. One of the long nagging lacunae hampering the construction metaphor in educational psychology and reading theory to date has been the implication in such a metaphor of a constructor who is in fact absent in most of the metaphor’s prevalent iterations (Spivey, 1997). Constructions do not just appear, after all. The existence of something constructed strongly implies a willful constructor with a deliberate purpose. In the case of metacognitive knowledge production, of course, the active agent is the conscientious learner, possibly assisted by adult or peer-aged counter-agents. But most learning or comprehension would seem to be consciously effortless, that is, automatic. The understanding that emerges as a result of presumed non-conscious processes thus seems to be received. Who, then, in these more common instances, is the willful constructor?

Were the construction metaphor merely a linguistic trope, this would hardly be a matter of much concern. But such structural metaphors guide our thinking (Lakoff &
Johnson, 1999), and, when incorporated into our models of cognition, stake out the parameters of our epistemologies. Seen this way, the constructivist metaphor, for all its seeming promise, is sorely lacking, even as a functional metaphor. Indeed, without an agent of some sort to act as constructor to construct the constructions, the whole notion of construction as an analogy for knowledge processes inside the head reduces to a piecemeal version of a transmission model of learning (Iran-Nejad, in press).

By contrast, because social constructionism situates knowledge processes outside the head and cites agents in congress as the willful constructors of shared understandings and narratives, the construction metaphor is made whole, the analogy coherent. In so far as this metaphor has any value for understanding literacy development, I believe it is worthy of some detailed review. (There is even growing promise, in the most current formulations of social constructionism, of eluding the inside/outside the head dichotomy all together.) In addition, social constructionism has evolved over several decades utilizing many of the same theoretical motifs and methodological lenses as literacy research, but it has matched these in very different ways with interesting results. Researchers in literacy development, therefore, may gain insights and inspiration from a review of how these different approaches have played out to date.

A Preliminary Definition

Perhaps the simplest way of distinguishing constructionism from constructivism is by defining the former as a sociological description of knowledge, while understanding
the latter as a *psychological* description of knowledge (Berger & Luckmann, 1966; Burr, 1995; Gergen, 1985). That is to say, while constructivism deals with knowledge formation *in the head*, constructionism deals with knowledge formation *outside the head between participants in social relationship* (J. Green, personal communication, May, 18, 1997). Although some scholars consider social constructionism synonymous with social constructivism (Spivey, 1997), such forms of macro-constructivism still primarily concern themselves with the influence of social processes upon an individual’s psychological (or phenomenological) construction of meaning. Constructionism, by contrast, may be usefully understood as being about the way knowledge is constructed by, for, and between members of a discursively mediated community.

This distinction is too simple, however, as it relies uncritically on the disciplinary distinction between sociological and psychological phenomena, a distinction that is itself socially constructed. It also ignores the lion’s share of the work in social constructionism on how collectivities generate meaning often without demonstrating an explicit intention to do so. Much socially constructed meaning is taken at face value by members of a community as fact, reality, common sense, or otherwise inarguably foundational. Social constructionism is as concerned with this constitution of life worlds as it is with the construction of particular phenomena.

Unfortunately, as this term has been borrowed into both adjacent and far-flung fields of inquiry, it has suffered egregious transmutation. Hence, while in communication
theory constructionism has been posited as an alternative to *transmission* and *constructivist* models (Gronbeck, 1981), and while in composition studies it has more recently been contrasted with *expressivism* (Fishman & McCarthy, 1992; Keppel, 1995), in feminist studies constructionism is opposed to *essentialism* (DeLamater & Hyde, 1998), and in social problems theory it is countered by *naturalism* (Gubrium, 1993). However, such simplistic dichotomies do not explicate what social constructionism is; they only intimate what it is not.

Even within ostensibly social constructionist literature, ambiguities and uncertainties abound. There is a distinction made by many authors (and blurred by others) between strong or extreme social constructionism, and weak or mild constructionism (Burningham & Cooper, 1999). Some cognitive constructivists appropriate the term constructionism to differentiate their particular take on Piaget (Feffer, 1988; Papert, 1993). Other analysts of what is clearly social constructionism (i.e., the work of Kenneth Gergen) inexplicably label it constructivism (Fuller, 1998; Lynch, 1998). Related terms such as *constructuralism* (Goodman, 1978) and *deconstruction* (Derrida, 1976) add to the confusion. And, increasingly, the adjective *social* and the verb *construct* get tossed loosely about in social science research, including literacy education research, where the terms signify nothing more than *productive collective activity*.

In this paper, I hope to clarify three ways in which social constructionism can be formally understood, and how these three models of social constructionism might prove
useful for literacy education theory and research. I will suggest that social constructionism can be subdivided historically and paradigmatically into three waves: a sociological social constructionist wave, a poststructural social constructionist wave, and a fairly recent third wave predicated on what I will term *the new realism(s)*. I will conclude by maintaining that any of these three may prove useful as a framework for current research in reading and literacy education. Of course, it would be beyond the scope of this paper to analyze these frameworks in comprehensive detail, so I will therefore restrict myself to close treatments of salient authors whose texts, I believe, can fairly be said to represent each wave.

Social Constructionism’s First Wave

*The Sociology of Knowledge*

The historical roots of constructionism emerge in the 1920s from Max Scheler’s (1980) founding and Karl Mannheim’s (1991) subsequent development of *the sociology of knowledge*. These scholars drew their ideas from (and often in refutation to) a substratum of 19th and early 20th century German philosophy including Marx’s (1967) historical materialism, Nietzsche’s (1967, 1996) anti-idealist critique, and Dilthy’s (1996) hermeneutic historicism (Berger & Luckmann, 1966). Subsequently, the anthropologist Emile Durkheim (1983), the sociologist Max Weber (1978), and, in America, the social psychologist George Herbert Mead (1982) and the sociologist Robert Merton (1996) all played formative roles in demonstrating the application of the sociology of knowledge
within their respective fields (Berger & Luckmann, 1966; Burr, 1995). The conceptual
taproot of all this would seem to be neo-Hegalian historicism (and its metaphysical
predicates in German Idealism, continental Romanticism, and neo-Kantian philosophy),
with the substitution of sociocultural forces replacing historical forces as the centrally
determinitive factor in human knowledge and behavior (Farrell, 1996). Sociology of
knowledge strove to analyze how these social forces constructed knowledge and the type
of knowledge they produced. Early work struggled with questions of ideology, false
consciousness, and the construction of true versus erroneous knowledge. (For a diverse
sampling of early writings in the sociology of knowledge, see Curtis & Petras, 1970.)

The commonly cited watershed works in Anglo-American social constructionism
are Thomas Kuhn’s *The Structure of Scientific Revolutions* (1962) and Berger and
Luckmann’s *The Social Construction of Reality* (1966). Kuhn dismissed the simplistic
notion that scientific progress was the result of the mere accrual of discoveries and facts.
Instead, following on the work of Ludwig Fleck (1979/1935) and Kuhn’s own mentor,
James Bryant Conant (1951), Kuhn argued that scientific research was ever conducted by
the light of those theoretical models coherent within a given paradigm or meta-theoretical
gestalt. Moreover, he noted that, given the right circumstances (e.g., the accrual of a
critical mass of paradigmatically incompliant findings), those paradigms could shift,
thereby rendering previous theories incoherent, and previous facts obsolete. Put crudely,
what counted as scientific fact was contingent upon the vagaries of scientific discourse;
scientific descriptions of reality were not discovered but symbolically produced and
confirmed by agreement within a scientific community. Berger and Luckman’s (1966)
seminal work is not as well known among literacy researchers as is Kuhn’s, so I will
devote more attention to it below.

*Berger and Luckmann’s* The Social Construction of Reality

Drawing from the aforementioned tradition in the sociology of knowledge, Berger
and Luckmann attempted to broaden the scope of the discipline by extricating it from
what they saw as cross-disciplinary confusions. They noted that the sociology of
knowledge had become mired, at a theoretical level, in questions of ideology and
epistemology, and, at the empirical level, in studies on the history of ideas. Taking their
cue from the sociologist Werner Stark (1991), they sidestepped ideological critique
altogether on the grounds that the validity of social constructions was not at issue for a
purely sociological analysis. Moreover, Berger and Luckmann insisted that
epistemological questions surrounding the methodology of the sociology of knowledge
were matters to be resolved by philosophy, not sociology. As Berger and Luckmann
(1966) put it, “To include epistemological questions concerning the validity of
sociological knowledge in the sociology of knowledge is somewhat like trying to push a
bus in which one is riding…. these questions are not themselves part of the empirical
discipline of sociology” (p. 13).
Berger and Luckmann’s second move was to insist that a proper sociology of knowledge cannot be interested in only the history of theoretical (academic) ideas, as these comprise but a small part of the knowledge construction in a society. Relying on theoretical justifications from their colleague, the social philosopher Alfred Schutz (Schutz & Luckmann, 1973), Berger and Luckmann called for a focus not on ideas, but on the commonsense knowledge of reality that has congealed as such for the man and woman on the street—reality *sui generis*. As to how such a fabric of meanings could be empirically studied, Berger and Luckmann, integrating the perspectives of Durkheim and Weber, noted that,

Society does indeed possess objective facticity. And society is indeed built up by activity that expresses subjective meaning…. The central question for sociological theory can then be put as follows: How is it possible that subjective meanings become objective facticities?… an adequate understanding of the ‘reality *sui generis*’ of society requires an inquiry into the manner in which this reality is constructed. This inquiry, we maintain, is the task of the sociology of knowledge.

(p. 18)

Centrally important to Berger and Luckmann’s framework is the utility of language as a medium of signification that allows the objectification of subjective meanings as well as the internalization (and subjectification) of social meanings. Moreover, the capacity of language to signify themes that span directly or analogically
across various spatial, temporal, causal, and conceptual domains frees subjectivity from
the immediacy of the embodied here-and-now to entertain more distant or abstract
spheres of meaning. This detachability is what allows for externalization and the
transference from subjective meanings to objective meanings and back again. Building
upon this, *The Social Construction of Reality* argues that societies dialectically augment
both objective reality, by way of institutionalization and legitimization, and subjective
reality, through socialization and the development of identity, and these two domains of
reality are inextricably bound up in, even as they constitute, the discursive fabric of social
meanings.

Perhaps as important as what Berger and Luckmann argued on behalf of, is what
they explicitly did *not* claim. For one thing, Berger and Luckmann rejected both
structural and process models of sociality, noting that “a purely structural sociology is
endemically in danger of reifying social phenomena. Even if it begins by modestly
assigning to its constructs merely heuristic status, it all too frequently ends by confusing
its own conceptualizations with the laws of the universe.… We cannot agree that
sociology has as its object the alleged ‘dynamics’ of social and psychological ‘systems,`
placed *post hoc* into a dubious relationship…” (pp. 186-187, emphasis in the original).
What they argued for instead was a dialectical relationship between society and the
individual and the interactive emergence of social constructions of both reality and
identity.

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Identity is, of course, a key element of subjective reality, and like all subjective reality, stands in a dialectical relationship with society. Identity is formed by social processes. Once crystallized, it is maintained, modified, or even reshaped by social relations. The social processes involved in both the formation and the maintenance of identity are determined by the social structure. Conversely, the identities produced by the interplay of organism, individual consciousness and social structure react upon the given social structure, maintaining it, modifying it, or even reshaping it. Societies have histories… made by men (sic) with specific identities. (p. 173)

It is also worth noting that Berger and Luckmann devoted what might seem to today’s constructionists to be a considerable amount of space to the crucial mediation of the biological aspects of the organism. Drawing from the work of European biologists, ethologists, and biologically informed anthropologists, Berger and Luckmann noted, “It is important to stress… that the organism continues to affect each phase of man’s reality-constructing activity and that the organism, in turn, is itself affected by this activity. Put crudely, man’s animality is transformed in socialization, but it is not abolished” (p. 180). Or, as cognitive ethologists and developmental psychobiologists might say today, human meaning-making is a species-specific activity, and is both constrained and afforded by species-specific morphology and species-probable behavior which develop interactively with their physical, social, and cultural surrounds. “Man is biologically predestined to
construct and to inhabit a world with others. This world becomes for him the dominant
and definite reality. Its limits are set by nature, but once constructed, this world acts back
upon nature” (p. 183). As such allowances for the foundational and visceral might
indicate, Berger and Luckmann’s social constructionist focus is on the symbolic
meanings constructed by society and the symbolic, behavioral, and technological
reorganization of the environment (including cultural environment); they are not making
an ontological claim about how society constructs physical or biological reality’s
underlying facticities. Thus, sociology of knowledge can remain an empirical form of
inquiry. Finally, Berger and Luckmann were explicit that sociology of knowledge “does
not imply that sociology is not a science, that its methods should be other than empirical,
or that it cannot be ‘value-free.’” (p. 189, emphasis in the original).

The Legacy of The Social Construction of Reality

Eagerly taken up in other branches of sociology, insights from the sociology of
knowledge (now dubbed social constructionism, thanks to Berger and Luckmann’s title)
spread to inspire theoretical variants in historical, anthropological, linguistic, literary, and
psychological research. With each leap of a disciplinary boundary, however,
constructionism was recontextualized and thereby reconstructed. Thus, looking back over
the 1970s, the scholar of rhetoric Gronbeck (1981) lamented:

Constructionism currently encompasses a dizzying maelstrom of scholarly
impulses. While its bible among rhetorical theorists and critics perhaps is Berger
and Luckmann’s *The Social Construction of Reality*, its many different forms pledge allegiance to innumerable other fountainheads. The political symbolists… are strongly Burkean… the “legitimation” scholarship (these days) is driven past Berger and Luckmann, past even Weber, to continental critical sociologists, notably Jürgen Habermas; sociologists such as Duncan acknowledge their debt to Mead, while anthropologists are wont to go back even farther, to Durkheim or to linguists in Saussurian traditions. (pp. 250-251)

Alas, in order to retrofit the framework of the sociology of knowledge for use in other disciplines, the concepts behind the framework were first translated into the intellectual *lingua franca* of philosophy—and thus back into the very epistemological quagmire from which Berger and Luckmann had hoped to extract it. According to some scholars (Coleman & Sharrock, 1998; Greenwood, 1994), this translation was often done carelessly, as few taking up this new framework in the 1970s seemed to appreciate Berger and Luckmann’s methodological end-run around the epistemological question of what constitutes true knowledge. Instead, acolytes often mistook the empirical focus on the construction of what passes for knowledge in a society as an ontological claim that what passes for knowledge in a society *is* truth. According to Coleman and Sharrock (1998), this error paralleled a similar misappropriation of Kuhn’s observation—that knowledge is authorized by the agreement of a scientific community—as a claim that factual knowledge was nothing more than what a community of scientists agreed upon.
an overdrawn conclusion which Kuhn disputed. Yet other examples of such
misappropriation can be found in the frequent citations of Wittgenstein’s work by second
wave social constructionist scholars, at least according to their critics (Ellis, 1989;
Greenwood, 1994). (For a second wave interpretation of this supposed misappropriation,
see the next section.)

If these critical observations are correct, one is prompted to ask the following
question. If the work of Berger and Luckmann, Kuhn, and Wittgenstein—or for that
matter Austin (Greenwood, 1994), Derrida (Olson, 1990), Quine (1969), or Rorty (Olson,
1989)—did not actually support the perspective that all is language and language is
arbitrarily assigned meaning by social processes, with all its implicit relativism, why did
this error so consistently accrue in the theoretical appropriation of social
constructionism? I will suggest an answer to that question in the next segment of this
paper. But I close this segment with an assessment of Berger and Luckmann’s work by
Lynch (1998), who hinted in his genealogy of social constructionism that it was their
failure to take their insights to more radical extremes that led to their work’s eventual
dismissal by many postmodern social constructionists.

… while the content of Berger and Luckmann’s theory may have had little
subsequent influence [on poststructural theory], their literary practice was
exemplary. They succeeded in developing a plainly written account that
integrated Schutz’s (1964) social phenomenology with more mainstream lines of
social theory. The word ‘construction’ was pivotally important for introducing the concept of phenomenological ‘constitution’ to a large social science readership that was, and remains, more familiar with causal and instrumental idioms.…

Berger and Luckmann did not capitulate to the demands of positivist sociology, but they did successfully integrate Schutz’s teachings with a Weberian programme of value-free interpretive sociology. (pp. 24-25)

Social Constructionism’s Second Wave

*The Postmodern Turn in Social Psychology*

To define what constitutes second wave social constructionism, I will quote extensively from the work of Kenneth Gergen, arguably one of the most cited and respected of the postmodern social constructionists. Gergen is a social psychologist (I would be tempted to say a social processes psychologist), and he has used the term social constructionism to refer to his own and others’ related perspectives regularly since the 1970s.

Gergen (1985, 1987) originally identified social constructionism by four salient themes: (a) understanding of the world is not derived by observation but by linguistic, cultural, and historical contingencies; (b) “understanding is not automatically driven by the forces of nature, but is the result of an active, cooperative enterprise of persons in relationship” (1985, p. 263); (c) “The degree to which a given form of understanding prevails… is not fundamentally dependent on the empirical validity of the perspective in
question, but on the vicissitudes of social processes (e.g., communication, negotiation, conflict, rhetoric)” (p. 268); and (d) negotiated understandings are a form of social action and as such are integrated with all other human activities, an idea with profound implications for the analysis of the metaphors and assessments used in psychology, and social science more generally. Burr (1995) further augmented Gergen’s four themes of social constructionism with six other characteristics: (a) anti-essentialism; (b) anti-realism; (c) language as a pre-condition for thought; (d) language as a form of social action; (e) focus on interaction and social practices; and (f) focus on process.

Elsewhere, Gergen (1995) has placed this discursively oriented conception of social construction in thematic terms.

… constructionism is not so much a foundational theory of knowledge as an anti-foundational dialogue. Primary emphases of this dialogue are based on: the social-discursive matrix from which knowledge claims emerge and from which their justification is derived; the values/ideology implicit within knowledge posits; the modes of informal and institutional life sustained and replenished by ontological and epistemological commitments; and the distribution of power and privilege favoured by disciplinary beliefs. Much attention is also given to the creation and transformation of cultural constructions: the adjustment of belief/value systems: and the generation of new modes of pedagogy, scholarly expression and disciplinary relations. (p. 20).
Gergen embraced the postmodernist divorcement of linguistic descriptions from a foundational or essential reality. “… there seems good reason to view mental predicates as semantically free-floating. That is, the vocabulary of mind is not anchored in, defined by or ostensibly grounded in real-world particulars in such a way that propositions about mental events are subject to correction through observation” (Gergen, 1989, p. 11). He has also noted that “descriptive languages are not derived from observation; rather such languages operate as the lenses or filters through which we determine what counts as an object” (Gergen, 1987, p. 2). Hence, like Sapir (1921) and Whorf (Carroll, 1956), Gergen believed reality is constituted by the linguistic and discursive conventions we appropriate. Moreover, he developed the implications of this insight far beyond anything put forth by Berger and Luckmann.

This shift from an empirical sociology to a poststructural epistemology within social constructionism cannot be explained by appeal to factors entirely internal to the sociology of knowledge (e.g., the insights of Gergen, and others, or the aforementioned putative misinterpretation of the works of Kuhn, Wittgenstein, and other philosophers, or even the borrowing of sociological ideas and poststructural idioms into psychology). Rather, a striking sea change in social constructionism during the 1970s seemed to occur which stands as an example of the very sort of paradigm shift hypothesized by Kuhn (1962). Taking a broader perspective, this disciplinary shift follows in tandem with a meta-theoretical shift across the social sciences and much of the academy overall.
Philosophy, social history, literary criticism and theory, linguistics, media study, and the theoretical sciences were all the beneficiaries of this new linguistic turn (Rorty, 1967).

[For a comprehensive, if succinct, period overview of these meta-theoretic developments, see Harland, (1987), but cf. Holton (1993); as to their lasting structural effect on social constructionism, see Gergen (1998a), upon whose account I base much of the following historical analysis.]

Perhaps as a result of the prevailing academic cultural milieu in the early 1970s, the conceptual liberation implied by relativist epistemology had an attraction for many young scholars of the period too tempting to resist. And if there was no legitimate, antecedent philosophical justification for introducing this liberatory relativism into academic scholarship, as critics have suggested, then the tenor of the times within which these scholars worked was such that they were prompted to construct such a justification, reading into these foundational texts what they were determined to find. As Gergen (1998a) noted, “It is interesting to consider the alternative course that history might have taken if Thomas Kuhn had not entitled his 1962 volume, The Structure of Scientific Revolutions. The political climate into which this title was injected virtually ensured that its reading would be charged with far more energy than the specifics of the book could warrant” (p. 40). This suggests that the putative misappropriation of writers like Kuhn, Berger and Luckmann, or Wittgenstein, noted earlier, might with only modest irony be considered case studies in the social construction of reality.
In light of these historical circumstances, Gergen (1998a) has identified three strands in postmodern social constructionism: social (drawn largely from the sociological frame of the first wave, but with a greater political consciousness), literary-rhetorical (drawing from the linguistic turn in poststructural philosophy and literary theory), and ideological (drawing from the highly charged radical politics of the period). What all three of these influences had in common was a commitment to the central importance of language/discourse in the social construction of reality, and a matching commitment to a spectrum of liberatory political positions. Some of the most important work in this vein was done by early feminist scholars who were largely responsible for bringing the insights of poststructuralism to bear on social discourse theory (Burr, 1995; Gergen, 1998a). (It is probable that the inflections of social constructionist, discursive, and poststructural theory in literacy education over the past decade have also stemmed from this source.)

Additionally, Derridian (Derrida, 1976), Foucauldian (Foucault, 1978), Lacanian (Smith, 1992) and Frankfurt school criticalities (Habermas, 1987; Horkheimer & Adorno, 1944/1997) were interwoven with the above three themes, often groomed to the needs of feminist and anti-colonial agendas. A heady combination, this, one fraught with emancipatory promise. (It should be understood that this is not a description of the development of poststructural philosophy or literary theory per se, but of the fashion in which poststructural idioms were taken up by influential social constructionist theorists.)
Trouble in Wonderland

Perhaps one of the most striking characteristics of postmodern social constructionism is its unlikely combination of uncompromising social critique with unbounded epistemological relativism to arrive at an unqualified cultural determinism.

An example of that determinism is provided by Burr (1995):

For each ‘thread’ of our identity, there is a limited (sometimes very limited) number of discourses on offer out of which we might fashion ourselves. For example, the discourses of sexuality on offer in our present society offer a restricted menu for the manufacture of sexual identity…. Given these representations of sexuality that are culturally available to us, we have no choice but to fashion our identity out of them. Our sexual activities (or lack of them!) can have no form of representation to ourselves or to the people around us other than in the form of these discourses… (p. 52, emphasis added).

Such statements are indicative of the move in second wave social constructionism from a sociological analysis of knowledge production (including subjective knowledge production) to an epistemological (indeed, an ontological) claim that knowledge is at all times and everywhere nothing but a social construct. Not only is subjective knowledge a social construct, according to this stronger formulation, the subject itself and its subjectivity are social constructs. The constraints presumably imposed by biology are in fact social constructions, as is the very notion of entities as biological organisms
(DeLamater & Hyde, 1998). And so on. In this fashion, distinctions between science and mythology dissolve into a miasmic sea of social constructions (Gergen & Davis, 1985). Simply put, everything is a social construct, including the concept of social construction (Burr, 1995)! [Indeed, this self-undermining paradox had already been raised against sociology of knowledge earlier in the century by philosopher Karl Popper (1970).]

This totalizing restatement of social constructionism has given rise to such startling paper titles as “Knowledge, consequences, and experience: The social construction of environmental problems” (Williams, 1998), and “Mass media and the death penalty: Social construction of three Nebraska executions” (Lipschultz & Hilt, 1999). It also gives rise to backlash reactions ranging from theoretical retreat (Carrithers, 1992) to critical refutation (Zuriff, 1998) to Alan Sokal’s notorious Social Text parody (1996a, 1996b).

Given the potential, over time, for shifts in political commitments, disciplinary interests, and philosophical conceits, it is not surprising that tensions have arisen within this second wave of social constructionism. Burr (1998) described her own experience:

When I first began to read about social constructionist ideas in the late 1980s, I was attracted, as I believe were many others, by the liberatory promise of its anti-essentialism…. if what we take ourselves and others to be are constructions and not objective descriptions, and if it is human beings who have built these constructions, then it is (at least in principle) possible to reconstruct ourselves in
ways which might be more facilitating for us, and social constructionism seemed
to me to offer the same basic message but on a wider social scale…. (pp. 13-14)
However, the promise social constructionism held for intellectuals such as Burr was not
without its limits.

…after a while I, like others, began to feel frustrated with constructionism and
somewhat disillusioned. The extreme relativistic views that were often espoused
under the banner of social constructionism seemed to lead down a road to social
and personal paralysis, for at least two reasons. First, if we must abandon any
notion of a reality which bears some relation, no matter how this relation is
conceived, to our constructions, then we are left with a multiplicity of
perspectives which become a bewildering array of… realities in themselves….
Secondly, the notion of “agency” slips between our fingers in the same way.
(1998, p.14)

Indeed, with the poststructural turn, cultural discourse seems to take on a unilateral role
in the production of not just social, but objective and subjective reality, obliterating any
account of agency, identity, individual differences, or conflict. As Burr (1998) herself
noted, how can one speak of oppressed groups if the concept of “groups” and
“oppression” are but social “constructions which can have no greater claim to truth than
any other?” (p. 14).
Summary of the Second Wave

Dissention has arisen within the ranks of postmodern constructionists as a result of this metaphysical solipsism. Critical researchers have grown increasingly disturbed by the way interpretive relativism undermines attempts at morally grounded political action. There is also evident distress within the ranks at the return to traditional modes of scientific inquiry by some researchers within the field and with those who have attempted positive reassessments of capitalist liberal democracy (Shotter, 1993). The suggestion has even been made that the political sensibilities of many fair-weather social constructionists are confined to the departmental hallway. (For a selection of these positions and arguments, and overviews of the situation, see Velody & Williams, 1998, and Parker, 1998.)

Dismayed at the current fractious condition of social constructionism and a perceived flight into realism, Gergen (1998b) noted, “How can we view this state as anything but unfortunate? It is not simply that we herald a condition of all against all. It is also a condition that deadens those within the contentious enclaves” (p. 149). Suggesting that constructionism and realism be thought of as not mutually exclusive forms of discourse, Gergen himself, donning a modified pragmatism that dare not speak its name, has appealed to the situational utility one discourse form may have over another (Gergen, 1998b).
It is too soon to speak of a poststructural social constructionist legacy. Although interest in this heady vein of inquiry may seem to have flagged in at least some fields, its promise for educational research has yet to be fully realized. This is particularly true in literacy education research, where the discursive orientation of second wave social constructionism could fit nicely with extant work in sociolinguistic and critical perspectives pertinent to classroom reality-making (Alvermann, Commeyras, Young, Randall, & Hinson 1997; Davies, 1994; Gee, 1990; Harste & Leland, 1998). To this end, an excellent introduction for literacy education scholars would be Jonathan Potter’s (1996) Representing Reality.

A Third Wave for Social Constructionism?

The New Realism(s)

Recent developments in postmodern social constructionism have led to a reappraisal of alternative perspective that, it is hoped, might avoid indiscriminate and disfunctionalizing relativism. One cross-disciplinary response has been the move towards a revivified realism, pragmatism, or naturalism. (Realism’s myriad definitions in philosophy are fair cause for confusion. For clarity, the term is not used here to refer retroactively to any ancient or medieval schools of philosophy, nor to the dubious philosophical category of naïve realism. [For a quick reference on 20th century realism, see Cunningham & Fitzgerald (1996). For a more extended review, see Putnam (1987).] Naturalism is a similarly overly applied term. [For a review of the various arguments in
the debate over naturalized epistemology stemming from the work of Willard Van Orman Quine (1969) and others, see Block, Flanagan, & Güzeldere (1998), or, from a decidedly antagonistic perspective, see Almeder (1998)]. I use these terms here loosely, and only because they are often used as self-descriptors by their various adherents.)

As with the second wave before it, this move towards a new realism or naturalism is not confined to social constructionism alone, but is a motif at work in current Anglo-American philosophy of mind, the various neurosciences, artificial intelligence and robotics, psychology, anthropology, and other social sciences. Its proponents, drawing from the methodology and philosophy of the natural sciences, are a varied group who utilize somewhat idiosyncratic terminologies, and while many agree on some things, none agree on all. This feisty and voluble crowd would include the scientific realism of John Greenwood (1994), the Marxist critical realism of Andrew Collier (1998), the biological realism of Daniel Dennett (1995) and Ruth Milikan (1984), the philosophical naturalism of Owen Flanagan (1992) or Fred Dretske (1995), the socio-naturalism of Chris Sinha (1988), the restricted harmless naturalism of Robert Almeder (1998), the coherence theory of Linda Alcoff (1996), the moral realism of Frank Farrell (1996), the pedestrian realism of Hilary Putnam (1987), even work on the limitations of discourse theory (Harré & Gillett, 1994; Hilton, 1988), supervenience (Drai, 1999), situated cognition (Clancey, 1997; Kirshner & Whitson, 1997), ecological psychology (Reed, 1996), and, as recently evidenced in this publication, a positive reappraisal of pragmatism
(Dillon, O’Brien, & Heilman, 2000). (The following caricature of the new realisms is based chiefly on the work of Farrell, Flanagan, and Greenwood.)

Many (though not all) of these scholars believe that there is likely a coherent and dependably consistent reality that is the basis for our sensations, even if our sensations do not resemble the causative onta that prompt them or demonstrate the same presumed cohesion or consistency. Moreover, both this ontological reality and the phenomenal experience (sensations and visceral associations) it generates are independent of our symbolic representations (i.e., reality precedes language, claims realists like John Greenwood (1994), who adds that there is a useful and important distinction to be made between epistemic objectivity and linguistic objectivity). Our symbolic representations of reality cannot therefore be said to resemble their cause, or even the reality of our experience, but do nonetheless reference the real, greater-than-human world. Thus, pace both empirical researchers and their poststructural critics, the truth value of our models and theories can never be predicated on the seductiveness of their seeming veridicality (the degree to which they seem to resemble the phenomenon under examination). Rather, the validity of our representations can only be determined by their pragmatic indexicality and the degree to which they allow us to make dependably accurate predictions about phenomena (a position also known as reliabilism). Such knowledge can demonstrably give us a greater or lesser capacity to negotiate the real constraints and affordances of our
world, including our social world, and allow us to pursue a more fruitful and satisfying condition. (Of course, the Devil still lurks in the morass of methodological detail.)

That our grasp of reality is provisional and mediated by socially constructed descriptions is fully acknowledged by these new realists or neo-naturalists. Yet they deny that this renders the empirical examination of theoretical models worthless, just difficult. Some theories do allow us a better purchase on phenomenological tendencies than others, and this is usually demonstratable. While our representational models of reality are socially constructed and hence always provisional, the phenomenal bases, or onta, they seek to explain are generally not socially constructed. Some realists and empirical naturalists (Block, Flanagan, & Güzeldere, 1998; Clancey, 1997; Dennett, 1995; Iran-Nejad, in press; Millikan, 1984) have insisted that our embodied nature requires that more attention be paid to biological and ecological systems if we are to understand human mentation and behaviors, including linguistic, cognitive, and social behaviors, and the meanings they articulate. This position is consistent with what has been embraced in mainstream anthropology over the past quarter century (Bates, 1998; Haviland, 2000, Konner, 1982).

Other new realists (e.g., Collier, 1998; Farrell, 1996) use realist positions to underscore the moral dimension grounding human action. Undermining relativism is thus outings as a strategy for preserving one’s socioeconomic advantages while gleaning the brownie points of liberatory criticality. All would seem to agree that utter relativism is
neither agreeable nor unavoidable. All acknowledge the limitations of empiricism, positivism, and hypothetico-deductive inquiry. And while acknowledging the importance of language or culture, most would limit the extent to which either can be constitutive of all human experience or behavior.

For these scholars, dyadic (Saussurian) linguistics and similar frameworks in continental semiotics that have heavily influenced current discourse theory seem in practice to suggest an unending inter-referentiality that must ultimately prove closed and circular, which is to say static, or at least adevelopmental. This is of course counter to what we know about the continual development evidenced within language systems (Coulmas, 1998). In addition, such zero-sum models, say the naturalists, miss the ecological grounding of, and thus the value-added nature of, human behavior and eco-biologic functionality more generally, a significant aspect of language purely analytic accounts have overlooked. For whatever else it may be described as, human language is most certainly a form of species-specific animal communication, the capacity for which is grounded in neurobiology (Hauser, 1996). That is, following Tinbergen (1963), language cannot be understood through analysis of structure or immediate function (linguistic pragmatics) alone. Developmental, evolutionary, and more general assessments of functionality must be brought to bear.
Relying on an ethological conception of sociality, the British sociologist and anthropologist Michael Carrithers (1992) has suggested the degree to which human behavior is underdetermined by social discourse alone.

[Individuals in relationships, and the interactive character of social life, are slightly more important, more real, than those things we designate as culture. According to the culture theory, people do things because of their culture; on the sociality theory, people do things with, to, and in respect of each other, using means that we can describe, if we wish to, as cultural (p. 34).]

And, again:

…collective representations have significance in their use by people in relation to other people and none apart from such use. … change [should] be thought of as natural, the setting of actual social life with all its fluidity, uncertainty, construals and misconstruals, its laboriously achieved continuity, its planned and its inadvertent innovations. So long as we think of humans simply as individuals subjected to a collectivity, or to disembodied cerebration, change of the sort human history so richly evidences becomes curiously distant and difficult to comprehend. A more thoroughly sociological view places change, not permanence, at the centre of our vision (p. 36).
Similarly, Minick, Stone, and Forman (1993) observed there is a one-dimensional reductiveness to frameworks that make the activity of the community the sole unit of analysis. Rather, they suggest that this needs to be replaced by the study of:

… real people who develop a variety of interpersonal relationships with one another in the course of their shared activity in a given institutional context.

Within educational institutions, for example, the sometimes conflicting responsibilities of mentorship and evaluation can give rise to distinct interpersonal relationships between teacher and pupils that have important influences on learning. For example, appropriating the speech or actions of another person requires a degree of identification with that person and the cultural community he or she represents. (p. 6)

In a parallel development, Wertsch (1998) has suggested reviving Kenneth Burke’s dramatistic pentad as a heuristic device for conceptualizing the necessary elements of action and motivation under study in activity theory in order to elude imposed reductivist or monadic models of causation.

**Summary**

It is certainly too soon to determine whether or not this move towards the new realisms is itself the next wave in social constructionism, or a bridge to something entirely different. (Of the scholars named previously, only some are formally participants in the current dialogues on social constructionism, though all are implicitly social
Most second wave social constructionists would understandably argue that a new realism perspective is antithetical to (their concept of) social constructionism. But, of course, the same criticism could be made by the original empirical sociologists about what postmodern idioms have done to their conception of social constructionism. In any case, a critical mass and momentum does seem to have developed in this neo-naturalist/realist vein reminiscent of the rise of interest in poststructural and postmodern work that occurred in the humanities during the 1970s and in literacy education in the late ‘80s and early ‘90s.

Social Constructionism and Reading

I have sketched out where social constructionism has been over the decades and where it may be going, and I have maintained that there have been three distinct waves: a sociological, a postmodern, and an emerging third wave grounded in new realism or neo-naturalism. I believe each of these has a potential utility for literacy education scholars, and in this final portion of the paper I wish to briefly suggest what those could be.

The central feature shared by all three waves of social constructionism, and other related variants such as situated cognition (Kirshner & Whitson, 1997), or activity theory (Wertsch, 1998), is a focus on how knowledge is socially constructed in communities. This stands in conceptual opposition to traditional work in reading education informed by cognitive constructivist psychology which has attempted to explain text decoding and reading comprehension by way of models of mental operations. Leaving aside the
question of how successful these interior models have been in promoting more effective classroom practice, we may well wonder how we can conceive of reading comprehension external to the student in a fashion that could prove useful in promoting students’ literacy development.

This line of consideration must be entirely speculative because it would seem that to date there has been little of methodological substance about reading education practice drawn explicitly from a social constructionist perspective. Still, work in literacy more generally has been implicitly informed by social constructionist themes, and there are teasing synchronicities between literacy research and social constructionism. Like social constructionism, literacy education has focused its research variously through developmental, psychological, and social lenses. Too, it has similarly enjoyed a substantial amount of empirical and theoretical work and a certain amount of poststructural and ideological critique.

However, it has not coupled these disciplinary motifs in the same way that social constructionism has. That is, it has never used poststructural critique to produce a socially and discursively modified psychological lens with which to address reading processes. On the other hand, much cultural theory in reading, as elsewhere in education, is perhaps too conceptually vague and reductive to be useful in state-of-the-art empirical studies (Schoenfeld, 1999). But this is not to say that a thoroughly empirical sociological approach to literacy, or a poststructural psychology of reading would be inconceivable.
Exemplars in first and second wave social constructionism might prove fruitful fonts of inspiration.

The usefulness of the third wave of social constructionism is more problematic. With its focus on subjective agency and the constraints and affordances of the organically constituted world, literacy might be reconceived as developmentally entwined with social structures and processes in a fashion far more subtle and complex than anything hitherto attempted. In such a naturalistic view, separating the mental from the actual, as the first two waves have done (the inside/outside the head dichotomy), is a mistake which misconceives the bio-ecological nature of neurologically endowed organisms in the living world (Abram, 1996; Biddell & Fischer, 1998; Hendriks-Jansen, 1996). But the implications of this for understanding language are unclear, and, for understanding literacy development, uncertain.

**Literacy Researchers Constructing Social Construction**

As noted at the beginning of this paper, the verb *construct* and the adjective *social* are often bandied about loosely in literacy education scholarship. Aside from the legitimate use of these terms in reference to social constructivist psychology (Sipe, 1998), or the less formal use of the terms to signify productive collective activity (Bean & Valerio, 1997), there are three quite distinct senses in which the term social construction is used. These are often used interchangeably, and, lest increased confusion confound our embrace of these notions, we would do well to try to clarify them. The reader should keep
in mind that these three uses of social construction do not correlate to the three previously reviewed historical waves.

The first sense of social construction is quite traditional, and can be found in literacy work borrowing theoretical justification from feminist scholarship on the social construction of gender (Lloyd, 1998). Here we have a phenomenon, gender, acknowledged by the average man and woman on the street. However, the pedestrian sense of gender often confuses it with sexual designation, and hence confers upon gender the status of essential, indeed biological, foundation. Social constructionist research would demonstrate not only how gender is constructed, but how we designate gender as a fundamental aspect of reality, thereby veiling its sociocultural origins. The social construction of identity through literacy is a similar example (Mahiri & Godley, 1998; McCarthey, 1998; Prentiss, 1998), as is the social construction of race (Hirschfeld, 1996).

A second, more obvious sense of social construction can be found in analyses of the social construction of literacy. Here, the phenomenon, literacy, as with gender, is acknowledged by the general public. But unlike gender, literacy is not generally presumed to be a natural state. Rather, literacy requires schooling. Schools are social institutions. Hence, literacy is socially constructed. There is also a less obvious sense in which literacy is constructed, of course. How we define literacy, how we choose to teach it, and how we hope to assess it are all the result of both deliberate and tacit social negotiation. But, given the recent media-publicized debates over reading methods and
testing, I believe it is likely that the average citizen would acknowledge this more subtle sense of literacy’s social constitution. At the very least, the pedestrian would have to acknowledge that the matter is far from settled and thus is in process, even if the pedestrian in question already has the, ahem, correct answer herself.

Finally, there is a rather paradoxical use of social construction, as in the social construction of power relations sometimes interwoven with work on subjectivity or identity. Here we have a phenomenon, power relationships, that ostensibly foment identity, membership, agency, motivation, ability, etc. That differences in power or social standing exist is something most people would acknowledge, but that these relationships constitute our sense of self and motivate our behaviors and beliefs is perhaps generally doubted, at least within North America. Whether these power relations are indeed socially constructed is therefore moot. Critical pedagogues would likely insist that the average citizen’s denial of the existence of such webs of power, dominance, and oppression, show that both the phenomenon and the process behind it have been constructively veiled. This is more commonly referred to as false consciousness. But the conundrum here is that false consciousness implies a true consciousness, an awareness of how things really are. But social constructionist theories would insist that true consciousness is as socially constructed as is false consciousness (Berger & Luckmann, 1966; Burr, 1998). There is no privileged position outside of the social processes that constitute our conception of reality. Indeed, 20th century-styled academics engaged
without irony in such critical assertions might well provide a case study of social
construction itself, or rather, of failed social construction. Such academics, after all, are
members of a powerful social institution (most are now tenured), and they are attempting
to construct a theory of power relations that they would have taken as reality. But the
man and woman on the street seem not to be buying the idea, even though it promises
them their freedom. Why not? This would be a fascinating topic to analyze by the lights
of social construction theory. In any event, it gets us back to the very arguments over
ideology and false consciousness Mannheim (1991) and other scholars of the sociology
of knowledge struggled with in the early decades of the 20th century.

Conclusion with Prefatory Cautions

I would be remiss if I did not acknowledge that the foregoing historical review is
a metanarrative, and like all metanarratives is subject to interrogation. Metanarratives
abound in all and every culture, community, and inner monologue. Even postmodernists
spin them, their deconstructions a form of renarrativization, but never denarrativization.
The ubiquity is with good reason: metanarratives are the indispensable result of the
dialectic between the production of meaning and the maintenance of a productive
sociality. Metanarratives are conceptual maps that locate us, or, rather, give us a sense of
location and hence orientation. They are the result of our sense making and they help us
make sense. I hope I have managed that to some extent here, but I concede that there are
other ways of spinning a metanarrative on the history of social constructionism.
For instance, as previously noted, some scholars (Phillips, 2000; Spivey, 1997) describe similar historical developments in the history of ideas as forms of social constructivism. Chinn (1998), reading from a science education perspective, also prefers the term social constructivism, choosing to restrict the term constructionism to only that work which examines knowledge construction by scientists in laboratories. I find the narrowness of this usage unjustified (Chinn fails to cite Gergen, or most of the other postmodern social constructionist cited in this paper). Other analysts (Greenwood, 1994; McCarty & Schwandt, 2000) cite Gergen exclusively (and harshly) as the be-all and end-all of social constructionism, and so offer a very different but equally truncated definition. Interestingly, Chinn (1998) identified three distinct perspectives in the social construction of knowledge similar to the three paradigmatic waves noted in this paper. He termed these the traditional view, social constructivism (including social interest theory, social constructionism, and methodological constructivism), and integrated constructivism. This last, which coincides with what I call the new realism(s), is described by Chinn as a continuum between realist and anti-realist positions, and he gives excellent examples of how this perspective can be related to research methodology.

As acknowledged at the beginning of this paper, distinguishing constructivism from constructionism is no simple matter. It would be erroneous and ironic to suggest that there are clear demarcations between the two that could be anything but contrivances of our own devising. Still, I believe there is a utility in constructing such a distinction,
because if every attempt to explain understanding – from cognitive processes, to developmental transactions, to social dialectic, to deconstructions of discourse forms – is labeled constructivism, then what is not? Serious differences in how we might describe human sociality and its inherent penchant for meaning-making require distinguishing terminology. Otherwise, we will not know precisely what it is we are talking about, as too often seems to be the case in the confused and confusing use of the terms constructionism and constructivism.

In this paper I have attempted a review of what I see as the three principle variants of social constructionism, hoping in the process to more clearly define what social constructionism has been, is now, and can be in the future. I believe the chief value of these three variants of social constructionism lies with their potential to formalize and detail our understanding of the social and interpersonal processes that order classroom learning. Work on these areas has tended to refer to sociality in overly generalized and often vague fashion (Schoenfeld, 1999). The three formal variants of social constructionism reviewed here provide theoretical frameworks of knowledge development that would possibly give greater precision and focus to classroom inquiry. And it locates the better portion of this development where the teacher can get at it: in the social realm of the classroom, a boon for teacher researchers. As for academics researchers, current formulations of social constructionism rely on and build upon a rich vein of recent inquiry by developmental, cognitive, sociolinguistic, anthropological, and
neuroendocrinological science. Theoretical applications for reading and literacy education are now a matter for future work in literacy studies. I hope here to have only encouraged such inquiry by articulating a vision of the paradigmatic history of social constructionism.
The sheer giddiness induced by a stroll through the Internet carnival, tripping the sites fantastic, can make it difficult to take seriously the web’s more scholarly promise. Indeed, the overwhelming online frivolity makes it hard at times to recall that researchers hoping to facilitate their scholarship originally launched the World Wide Web.

Nonetheless, there are presently over two thousand scholarly journals online (“More than 2,000 journals,” 2000), and libraries now face the prospect of Internet subscriptions replacing their onsite holdings (Chu, 2000; Lougee, 2000). This raises several contentious issues related to library costs and management (Odlyzko, 1999), publication subscription pricing (Buckholtz, 1999), and the adjustments necessary for peer-review, tenure, and other constructs of professional legitimacy in the academy (Speier, Palmer, Wren, & Hahn, 1999).

Fundamentally, these concerns center around the ephemeral nature and likely impermanence of electronic information forms and the databases they represent.

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Publishers see vastly reduced costs in publishing their journals on the Internet rather than on paper. But libraries find these savings accrue only to the publishers as increased revenues. Worse, a library’s electronic subscription no longer purchases a tangible artifact to maintain as a holding through the ages. There is a concern over what happens when a library, inadvertently or due to budgetary constraints, allows a subscription to lapse. Does the library lose access to the issues for which it has already paid? What happens when a publication folds or a publisher goes bankrupt? Who will maintain back issues of defunct journals? Indeed, who will maintain past issues of current periodicals as changing technology and its newer storage forms render current databases unreadable? Simply put, who or what will play electronic librarian?

These concerns have prompted complaints that the always-increasing subscription fees for academic e-journals do not give libraries their money’s worth. Libraries argue for passing on the expense of accessing an online journal to the individual user on either an individual subscription or a per use basis. But publishers counter that lack of library presence will seriously impinge upon the perceived legitimacy, and thus monetary value, of their journals. Moreover, such a move would entail significantly higher accounting costs, and it would force publishers to price their product on a demand basis. No longer would publishers be able to dip into the tax-and-tuition troughs of the universities where monies are often spent for the prestige of appearing competitively comprehensive, rather than on actual scholarly need.
The impermanence of electronic information is of equal concern to scholars. Although electronic peer-review may be every bit as exacting as that conducted by pulp-based publications, it is difficult to substantiate the value of scholarship whose accessibility cannot be guaranteed in ten year’s time. If a theoretical argument is in part dependent on the support of citations, and those references can no longer be referenced, what happens to the strength of the argument? One might just as well employ a literature review based entirely on personal communications from the dead.

Moves by some universities (e.g., The University of Georgia and Virginia Tech) to abandon the shelving of bound dissertations and theses in their libraries, requiring instead that these documents be submitted in electronic form for posting on the Internet, raises related dilemmas. Making dissertations available on line in order to avoid inter-library loan handling costs ends their status as non-published documents. Since reputable academic journals will not publish articles based on work published elsewhere (and book publishers have no economic incentive to do so), new scholars will find themselves unable to make use of their dissertation research to advance their careers – a severe handicap coming out of the gate into the publish-or-perish world with a tenure time clock ticking.

These are some of the political, economic, and cultural concerns surrounding the promulgation of academic journals, including journals of literacy, on the Internet. But I wish here to review a representative sampling of online literacy journals through a quite
different and mischievous lens. I wish to consider the influence of natural forces at work in the metamorphosis of text forms as they have climbed down from the tree branches of our libraries and stepped out onto the savanna of the Internet. Meaning to say, I wish to broach that most taboo of subjects in altruistically oriented social science: evolution.

Genes, Memes, and E-journals of Literacy

There are currently dozens of literacy education and reading research-related e-journals on the Internet. Some of the names are familiar, some new. These e-offerings range from the timid and perfunctory, through the serviceable if lackluster, to the bold and engaging. In fact, at the more inspired end of the spectrum, the boundedness of the traditional journal form is perforated with links, applets, and interactivity to such a degree that it becomes difficult to determine where an e-journal leaves off and a unique form of information nexus begins.

The web is abrim with information sites that offer resources to teachers, teacher educators, and literacy researchers. Where they are intelligently and substantively packaged, a journal-like interface seems naturally to arise. As an example, with its reports, minutes, proceedings, conference highlights, paper calls, and links to its publication sites, the home page for the American Educational Researcher Association (http://www.aera.net) is practically an e-journal in its own right. The same can be said for the home pages of the National Council of Teachers of English (http://www.ncte.org), the International Reading Association (http://www.reading.org), and the Educational
Research Network (http://www.ernweb.com/). Strictly speaking, however, these are not e-journals. On the other hand, some self-described e-journals of literacy, such as Kairos (http://english.ttu.edu/kairos/index.html), or PRE/TEXT: Electra(Lite) (http://wwwpub.utdallas.edu/~atrue/PRETEXT/info.html), stretch readers’ notions of what constitutes a periodical well beyond the original bounds set forth by Addison and Steele in the early 1700s (Drabble, 2000). Chat rooms, bulletin boards, e-mail alerts, and integrative hypertextuality engage readers in entirely novel ways (Bolter, 1991; Labbo & Reinking, 1999; Reinking & Watkins, 2000). When employed in online journals, the effect on the genre is a case of technological deixis (Leu, 2000) as literacy and its forms are regularly redefined.

The rapidly changing development and inherent fuzziness of web site genres is perhaps connected. Let us consider it as a case of form evolving on the basis of natural selection, with all of the inherent challenges to devising a serviceable typology this presents. Evolutionary psychologist Richard Dawkins (1996), and philosophers such as Daniel Dennett (1995) and Ruth Millikan (1984), have argued that evolutionary processes are not just fundamentally biological, but informational; Darwin only stumbled upon one example of the evolutionary algorithm. Genes can be said to be carriers of information, after all, as can neural networks and the auto-immune system, all of which work on the basis of replication with variation allowing for selection (Edelman, 1992). Perhaps, so the argument goes, the same is true of texts, languages, and other expressive cultural forms.
If the units of information these forms contain were to variously reassemble like genes (theorists term these units *memes*), then the growth, development, and evolution of thought, information, or semiotic systems, could be conceived of as meme networks, replicating with variation, upon which selection acts to advance form. As intriguing as this idea may seem, it is worth recalling the warning of the pioneering ethologist Niko Tinbergen (1963), that morphology and behavior cannot be understood entirely by evolution – or by structure, or function, or development -- alone. An integrated and holistic approach incorporating all four of these lines of inquiry is in order when addressing complex organic systems.

But if we accept momentarily the idea that organic systems are essentially information systems, and *vice versa*, dynamic, non-linear, and emergent in their complexity (Sumara, 2000), the application of structural, functional, developmental, and evolutionary analyses to text forms may have some merit. Tinbergen’s approach may shed light on why semiotic forms, like living forms, alter rapidly in novel or unstable environments until such time as adaptive variants are selected for, whereupon the rate of change seems to reduce and the behavior of the semiotic genre or medium stabilizes. It may also explicate the recursive impact of novel and more adaptive semiotic forms on their socio-cultural environments.

For instance, films in their infancy were little more than stage plays recorded on celluloid, often taken in one long shot that encompassed the classical proscenium arch in
an attempt to capture the long-standing conventions of Western theatre. But filmmakers quickly explored and affirmed the unique affordances inherent in the new medium until a grammar of cinema could be said to have evolved. Thereafter, changes in that grammar risked confounding the audience, one presumed conversant in the new literacy of cinema, and cinematic novelty was nudged forward only by advances in the technology (e.g., sound, color, and Panavision) in transaction with changing communicative needs (e.g., expressive, aesthetic, cultural, and political).

The same can be said of early television, which was initially little more than radio with pictures, but which quickly came to take the generic program forms that have continued for five decades (e.g., the game show, the talk show, the news program, the sitcom, the crime drama, etc.). Even traditional print journals rapidly evolved away from the shipping manifests that spawned them, yet the distance of three hundred years from an early number of The Spectator to the latest issue of The Atlantic Monthly does not hamper our recognizing the continuity of the genre and our making use of it.

Thus, e-journals of literacy can similarly be seen at a formative juncture, novel and unstable, one located at the intersection of Tinbergen’s four causes. There is first the publishers’ intent and the readers’ presumed purposes (function), the realization of which is circumscribed by the constraints and affordances of the technology in transactional relationship with the developed literacy skills of the audience (structure). This leads to an ever foregrounding historical trace preceding and providing the footing for each new
appropriation of an adaptive affordance (development). Over a longer time frame, we find the recursively and mutually informing relationship between genres and users negotiating and thus modifying, in trial-and-error fashion, their ever-changing historical and ecological contingencies (evolution).

If the foregoing analogies with cinema and television are pertinent, we might expect the dazzling representational innovation that exploded onto the Internet in the 1990s to settle down. The developmental curve will flatten as a critical mass of users become conversant with the newer forms demanding an adherence to a grammar that facilitates their purposes. Thus, in spite of predictions of increased technological innovation (Toffler, 1970; Leu, 2000), literacy scholars, in time, will have an opportunity to catch up with the new literacies. Forms of information representation are eventually constrained by human limitation and the need for utility (Kamil, Intrator, & Kim, 2000). We may therefore anticipate a step-like transmutation in communicative forms—what evolutionary ecologists refer to as punctuated equilibrium (Gould, 1996)—not a continuous and ever more rapid progression.

To clarify the analogy, then: the Internet is a semiotic ecosystem; electronic publications are an order; e-journals of literacy are a species, and issues are generations. E-journals are also rapidly developing as individual visions, and I would group them into three sub-species: (a) web sites for traditional journals of literacy, (b) literacy e-journals sui generis, and (c) e-journal/web site/info portal hybrids.
Web Sites for Traditional Journals of Literacy

Each site in this subcategory is uniquely positioned along what seems a common developmental curve. It begins with a publication info page. Next, a table of contents for the current issue is added. Then the table of contents from past issues appears. And then the titles of the articles are linked to brief or full abstracts. Next, full texts for selected editorials and columns are offered. Then full text articles from past issue are included. Finally, throwing in the towel, the full text for the current issue is accessible to the online reader. Interlinked references, notes, and author bios develop. Hypertext composition techniques are utilized. Bring on the multimedia, and it’s “welcome to the new millennium!”

If many of these web sites for traditional journals sport a family resemblance, it is because they are actually related; they are the offspring of a handful of our larger professional literacy organizations. As an example, the International Reading Association sites include The Reading Teacher (http://www.reading.org/publications/journals/RT/index.html), The Journal of Adolescent and Adult Literacy (http://www.reading.org/publications/journals/JAAL/index.html), Lectura y Vida (http://www.lecturayvida.org.ar/), and Reading Research Quarterly (http://www.reading.org/publications/journals/RRQ/index.html). For the most part these are all fairly simple interlinked billboards with current and past tables of contents including one or two sentence abstracts. Occasionally, abbreviated versions of particular
columns can be obtained, such as *The Journal of Adolescent and Adult Literacy’s* “Standpoints & Voices,” and “Technology” departments. Interestingly, of all of these IRA publications, it is *Lectura y Vida*, the Spanish language literacy site, that is the most fully realized because it contains the most resources.

A bit more individuality can be found at the National Council of Teachers of English (http://www.ncte.org/journals/), which includes Language Arts (http://www.ncte.org/elem/la/index.html), *The English Journal*, (http://www.cc.ysu.edu/tej/), and *Research in the Teaching of English* (http://www.ncte.org/rte/). These sites offer only general information about each publication (submission and subscription information, call for manuscripts, staff directory) and tables of contents for current and past issues. However, both *The English Journal* and *Research in the Teaching of English* provide literacy resource link lists which Internet-savvy English teachers and literacy instructors will find useful. In the latter, for instance, a surfer will find the following six link lists: (a) organizations, university programs, and centers; (b) conference and publication opportunities (including indexes of academic journals); (c) awards, funding, and jobs; (d) teachers as researchers; (e) Internet research resources; and (f) theorists. It also offers readers’ response forums for specific articles in past numbers.

Although attractive, these sites share a palpable timidity. Unrelated sites that share this same reticence include the National Reading Conference’s *Journal of Literacy*
Research (http://www.coe.uga.edu/jlr/), Journal of Computer Assisted Learning (http://www.lancs.ac.uk/users/ktru/jcaljrnl.htm), and most of the American Educational Research Association’s e-journals (http://www.aera.net/index.html). The guardedness here is about divulging the full text of current and recent numbers. Apparently, the editors do not wish to render the print versions of their periodicals superfluous and thereby endanger the professional value for scholars of being published in them. In fairness, however, Journal of Literacy Research does offer full text pdf. files for select past issues, and AERA is bravely sending forth its ever timely Educational Researcher in a current, full text, electronic version (http://www.aera.net/pubs/er/eronline.htm). The layout of Educational Researcher is uninspired, but it is serviceable. Besides such general timidity and occasional boldness, there is a third, mercenary variant that is happy to offer you full access to its contents provided you pay a subscription fee. The Lion and the Unicorn, an international, theme-based journal for the discussion of children’s literature, is an example of this type (http://muse.jhu.edu/journals/lion%5Fand%5Fthe%5Funicorn/).

Literacy E-journals Sui Generis

These titles do not have print counterparts, and their form and function clearly put them in a class of Internet site all their own. But it is a grab bag of a class, from the barebones Journal of Electronic Publishing (http://www.press.umich.edu/jep/JEPsubject.html) to the bells and whistle festooned Kairos. Professional decorum varies widely as well, presenting a variety of approaches to
balancing intimations of academic legitimacy against the demands of the foreshortened attention span of the Internet surfer.

Hands down, one of the most consistently rewarding literacy sites in this subset is Reading Online (http://www.readingonline.org/) A true Internet journal on literacy from the International Reading Association, it is commendably laid out with a wealth of links hierarchically packed into a well-organized interface. Articles are divided into linked segments outlined up front; citations are linked to references. This site features peer-reviewed and invited articles, book reviews, reprints from other journals and the Handbook of Reading Research: Volume III (Kamil, Mosenthal, Pearson, & Barr, 2000), and a link to Bertram Bruce’s technology column from the Journal of Adolescent and Adult Literacy. Special sections include “From the Editors” (Bridget Dalton and Dana Grisham), “The Electronic Classroom” (classroom applications), “International Perspectives,” “New Literacies,” and “Online Communities.” Copious information about the site is available, from a list of reviewers to instructions for authors and reviewers. An email alert service, “What’s New On Reading Online,” is also available. All past articles back to May 1997 are accessible through the index. The site is easy for novices to comprehend and navigate. Top notch!

The beauty of online journals is that because they have such a wide reach, and are so inexpensive to produce and maintain, they can be as focused and eccentric as they like. Many titles revel in this freedom, some perhaps even to excess. One such example from
the domain of rhetoric is \textit{PRE/TEXT: Electra(Lite)}

(http://wwwpub.utdallas.edu/~atrue/PRETEXT/info.html). From the education school at
the University of Texas, Dallas, this intriguing e-journal is best described by its own self-
characterization:

\begin{quote}
“PRE/TEXT: Electra(Lite)… is an "ad hoc" electronic journal. This
electronic version, like the forthcoming ones, is an X-tension of the print
("pulp") version of PRE/TEXT: A Journal of Rhetorical Theory. With the
publication of Issue 2.1, P/T:E(L) has become a WOO-E-Journal on its
way to becoming 'Whatever.'”
\end{quote}

WOO-E, indeed!

This is quite a contrast to the more sober \textit{Currents in Electronic Literacy}

(http://www.cwrl.utexas.edu/currents/), maintained by the Computer Writing and
Research Lab of the Division of Rhetoric and Composition at the University of Texas at
Austin. \textit{Currents} is a scholarly electronic journal for the study of electronic literacy,
presenting articles on technology and literature, composition, language learning, rhetoric,
hypertext, software, and book reviews.

More perplexing still is \textit{Grammatron} (http://www.grammatron.com/about.html), a
"public domain narrative environment" developed by virtual artist Mark Amerika in
conjunction with the Brown University Graduate Creative Writing Program and the
National Science Foundation's Graphics and Visualization Center. This site’s explanatory
liner notes sound impressive, but the actual execution may leave you scratching your head. It’s like, um, conceptual performance art, kind of, you know?

Far more substantial is Kairos (http://english.ttu.edu/kairos/index.html), an excellent, sharply crafted, peer-reviewed site for “teachers of writing in webbed environments” (i.e., hypertexts) offering features, news, reviews, and interactive linkages. Article titles link to abstracts with links to additional information about the author, and a choice of a published or active version of the full text. Features are highly hypertextual in organization. This makes for exciting reading, but also points up the limitations of some experimental textual forms.


E-Journals/Web Site/Info Portal Hybrids

These are sites that, if not quite e-journals, are so close as to be indistinguishable from what most e-journals either are or might someday soon be. Some of these are fancy
information sites or link lists. Others are more substantive. All are in process. These include formal sites such as the University of Virginia Center for the Liberal Arts (http://www.virginia.edu/cla/english.htm) and individual efforts such as Fred’s Finds (http://www.peotone.will.k12.il.us/fs/Finds/langarts.html), a highly useful personal web page with a cornucopia of helpful sites for teachers, teacher educators and curious researchers.

Some of these sites are designed to be valuable resources such as *Net Library* (http://www.netlibrary.com/), *Educational Research Network* (http://www.ernweb.com/), and *The University of Sidney Library List of Electronic Journals and Texts* (http://www.library.usyd.edu.au/Ejournals/ejalph.html). Some, of a commercial nature, promote educational products, while still others are related to paper periodicals such as *The Chronicle of Higher Education Magazine & Journal Reader* (http://www.chronicle.com/free/magarch.htm), and *The New York Times Learning Network* (http://www.nytimes.com/learning/).

Problems with the Evolutionary Analogy

As interesting a heuristic as Dennett’s (1995) notion of a universal algorithm for adaptive progression may be, it suffers at least one obvious flaw: information systems do not autonomously generate, develop, or evolve, as do biological systems. They are not inherently proactive. Information systems are technologies created by human beings, cultural artifacts that alter in form only with human use. Given the fact that humans are
biological organisms, and given the inventive parsimony of design in nature, it is perhaps
not surprising that human development of cultural affordances reflect selective
adaptation. But Dennett is thus turned on his head: biological systems are not special
cases of information systems, but just the opposite. Information systems are ecologically-
oriented adaptations by biological organisms and hence reflect bio-ecological dynamics,
a presumption that has had long standing and fruitful consequences in the study of
cultures by anthropologists (Kehoe, 1998; Konner, 1982; McGee & Warms, 2000).

Moreover, to describe natural phenomena by the light of analogies to human
inventions is to re-present them in metaphor. Although this can often be heuristically
useful, we must ever be on guard against reifying such rhetorical tropes, no matter how
viscerally intuitive they may seem, and thereby, once again, anthropomorphize the
greater-than-human world (Abram, 1996). The mechanical, if adaptive, contrivances of
living organisms are not themselves living organisms. They do not literally develop;
human use of them does.

The new technologies are perceptually and conceptually dazzling and easily mask
the persistent human psycho-sociality, which drives them. These cultural adaptations (and
their framing rationalizations) are designed to harness our sociality in situated, responsive
ways. But because they cloak the factors that incite them, technology’s undoubted
ideological (Gee, 1990), social (Kirshner & Whitson, 1997), and bio-functional (Iran-
Nejad, 2000) bases are open to piece-meal and highly speculative analyses (perhaps too
often of a deterministic and reductionist stripe). All of which is to say that studies of technology use in the home, classroom, or community need to be located in larger frameworks capable of integrating semiotic, cultural, and psychological theory. The complex dynamics of bio-ecological systems might just be such a framework.

Conclusion

In this review I have attempted to touch briefly on some of the socioeconomic issues surrounding online academic journals, have half-seriously suggested a neo-naturalistic account of their development as semiotic forms, and have given examples of three “subspecies” of literacy e-journal sites. I have then acknowledged the shortcomings of an evolutionary analogy, while maintaining that there may yet be some larger theoretic value for literacy research situated within integrative bio-ecological frameworks.

A central issue raised at the start of this review, concerning publishers, libraries, and scholars alike, is the potential impermanence of electronic information forms. That e-journals of literacy have appeared and evolved in the past few years without leaving any historical trace of their developmental trajectory does not bode well for future research in this area. While I have made several suggestions about the procession of electronic journal forms along a continuum from timid to daring, there is no way to empirically demonstrate this theory – and the phenomena in question transpired within just the past five years!
Lest serious scholarship just become another disposable commodity, the academic research community will need to demand an answer to where, how, and by whom their work will be preserved in the future, one hopefully more reassuring than the whims of market forces in the publishing industry. Otherwise, the wave of the future might turn out to be a wave “bye-bye.”
A wag somewhere once noted that there are two kinds of people in the world:
those who believe there are two kinds of people in the world, and those who don’t. By
extension and much elaboration, we might observe further that there are at least two
kinds of people in literacy education in regard to the paradigmatic narratives they employ
in their research: those who subscribe to mechanistic motifs and metaphors, and those
who subscribe to contextualist motifs and metaphors. The mechanistic motifs addressing
what goes on inside learners and knowers are drawn from research from behavioral and
cognitive psychology on learning (e.g., Anderson, 1995; Kintsch, 1998). The
contextualist motifs addressing what goes on between learners and knowers are drawn
from historical and anthropological research on learning communities (e.g., Kirshner &
Whitson, 1997; Lave & Wenger, 1991). We might thus hypothesize that it is because the
cognitivist (mechanistic) and anthropological (contextualist) paradigms are not

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commensurable (Kuhn, 1962; Pepper, 1948), that research on learning processes and
learning communities within education has often been at odds, at times quite vehemently
(e.g., the phonics-whole language debate; the basics-critical thinking debate; the
situativist-cognitivist debate, and so on).

For this reason, I was initially encouraged by the development of alternative
tries to explain learning and literacy development in bio-ecological terms (Abram,
1996; Bidell & Fischer, 1998; Bronfenbrenner & Ceci, 2000; Iran-Nejad, 2000; Guthrie,
2000; Hruby, 2001a; Pearson, & Raphael, 1999; Sumara, 2001; Weiner, 2000). Bio-
ecological dynamics, after all, account for both that which occurs inside the organism
(biology) and that which occurs outside the organism (ecology). The distinction between
the biological and ecological is one chosen for its privileging of the multi-cellular
organism as life’s ultimate level of organization – the center of the organic universe, as it
were. This is, of course, a “truth” only multi-cellular organisms such as ourselves would
find self-evident. However, the dynamics of structural organization, supervenience,
adaptation, and agency are similar across the bio-ecological continuum (Michel &
Moore, 1995). And, happy happenstance, it just so happens that human beings “are”
ecologically situated, biological organisms (at least that has been the long-standing and
highly successful narrative assumption of the life sciences). Thus, the ecological motif
seemed to suggest a way to reconcile the inner and outer—cognitive and social—domains
of literacy development.
Unfortunately, these efforts to employ bio-ecological metaphors have been largely unsuccessful, I believe, because they have generally failed to acknowledge that bio-ecological systems can only be properly understood within an organicist theoretical framework (Pepper, 1948). To misconstrue the organic as wet mechanics (Kosslyn & Koenig, 1992) as the cognitive neo-connectionists do, or as merely inter-nested contextual locations (Bronfenbrenner, 1972) as many “ecological” analyses of classrooms do, is widely off the mark. It is as much of a travesty as thinking of interpersonal transactions as the end result of cognitive processes, or of reducing psychological accounts of behavior to mere rhetorical ploys for privileging the individual over community. In other words, in paying only lip service to the organic nature of bio-ecological systems, some researchers promoting supposedly ecological frameworks have missed the most obvious and helpful characteristics of the organicist trope.

This is not an unimportant matter. Currently, RAND is funding a major long-term research planning initiative that will set the course for future research (and research funding) for years to come (Sweet, Kamil, Alvermann, & Strickland, 2001). (The RAND RSG web site featuring a downloadable pdf. file of the report draft can be found at: www.RAND.org/multi/achievementforall.) The researchers involved in RAND’s Reading Study Group are highly respected and justifiably so. But in patching together their quilt of personal research interests, the issue of just how mechanistic and contextualist research is to fit together in a theoretically cohesive fashion is not
adequately addressed. Theirs is not a proper resolution, but a temporary truce, one at best guaranteeing fragmentary and epistemologically anemic understandings of literacy development, and at worse, continued professional infighting into the future. The fact that the RAND group has gingerly indicated that development (i.e. growth) might act as a unifying bridge between the two positions (Anders, 2001) is a masterful bit of irony, for contexts do not nurture just anything, and machines do not grow regardless of their contexts. Human development, as it is scientifically understood today, is an inherently organic, transactional process of extension and integration between and within levels of bio-ecological organization (Bjorklund, 2000; Elman, et al., 1996; Michel & Moore, 1995).

Though theoretically unsatisfying for literacy education researchers, this situation is nonetheless a wonderful example of how social processes foster scientific understandings and worldviews almost without regard for the nature of the central objects of their inquiry. In a phrase, the social construction of reality, or at least that portion of reality centered on literacy education, has literacy research stuck in a pair of parallel ruts on behalf of professional prerogative and the protection of personal legacies. It is this issue and the thematic dynamics of its construction that I wish to explore in this paper. The following, therefore, is not a proper research report, but a meditation on the ways in which we come to construct our understanding of literacy classrooms—what one might
refer to as the ecology of classroom research—and how it can be understood as an example of scientific social constructionism.

**Which Classroom Ecology?**

There are two ways in which the ecologies of learning and literacy development in classrooms can be thought of as socially constructed. The first entails the study and analysis of the factors at play in fostering patterns of classroom discourse. The procedures and tone set by the teacher, the personal behaviors and cultural values brought by the students, the policies and agendas posited by the school administration and the local school board, as well as parents’ expectations, political pressures from special interest groups, national policy initiatives, and so on: all of these go into the construction of certain patterns of practice, discourse, workaday schoolroom reality, or what we might otherwise describe as a pedagogic ecosystem. By the light of this first definition, researchers attempt to inventory and account for the multiple and complex transactive relationships between factors that constitute even as they give rise to such ecologies (Pearson & Raphael, 1999).

The other approach to describing the construction of classroom ecologies focuses on the way in which researchers themselves posit and describe learning and literacy development in classrooms. That is, while the first definition above presumes a transparent objectivity by researchers in the observation and description of the behaviors and relationships under examination in a classroom, the alternative definition references
the construction of those observations and descriptions by researchers. Research itself is an example of the social construction of knowledge which informs our sense of reality—both directly, in the sense of an accumulation of knowledge artifacts, and indirectly, by the fostering of models and theoretical frames that allow for coherence across artifacts, and, indeed, which allow knowledge artifacts to be identified as such.

This second approach to studying the social construction of classroom ecologies might be considered a special case within the sociology of scientific knowledge, or SSK (Potter, 1996). I believe researchers ought to address this specialized sense of social construction before attempting the broader sense, and it is scientific social construction in literacy education research that we will address in this paper.

Allow us therefore to briefly review how the social construction of realities has been hypothesized in sociological, psychological, and philosophical research, and distinguish between the scientific construction of our understanding of the natural world and the scientific construction of heuristics. I will maintain that it is crucial to differentiate between these two types of scientific constructs. To make the case for that distinction, I will cite some well known constructs in psychology and sociocultural education theory as examples of heuristics that have been inappropriately reified as aspects of the natural world in either its physical or conceptual sense. I will assert that confusing our theoretical models with material or ideational realities engages our predisposition toward territorial claims and all of the aggression, dominance displays, and
promotion of hierarchy endemic to primate sociality at its human worst. I will conclude by offering a few suggestions on how we might develop an alternative and more cohesive theoretical framework for literacy research, one informed by empirical research on the natural world but pointedly distinct from it, that is, one knowingly constructed as a narrative purely for its heuristic value in advancing research on literacy and learning.

Social constructionism: Some clarification

Up front, it is important to distinguish between social constructionism and social constructivism. The latter is concerned with the social processes that facilitate the psychological dynamics that produce understanding in learners (Phillips, 2000; Spivey, 1997). Social constructionism, by contrast, is concerned with the social processes themselves and the cultural artifacts they produce and that identify them (Font & Hruby, 2000). These social processes would include identification, classification, and legitimization of knowledge as such; identity assignation; and the institutionalization, preservation, and dissemination of knowledge. Artifacts would include things like books, libraries, schools, universities, professional organizations, and so on (Hruby, 2000). These distinctions are generalizations based on historic use (Hruby, 2001a), but they are not set in stone. Different definitions, inappropriate equation across levels of analysis, and blurring between the terms is common (Font & Hruby 2000; Hruby, 2001b; Phillips, 2000). This confusion is perhaps fostered by the allowance that, in a weak sense, all culture is evidence of social construction, from driving a car, to building a work shed, to
dancing the hootchie-cootchie: all demonstrate and can facilitate the distribution of knowledge.

Use of social constructionist theory in literacy education research has been inconsistent and somewhat confusing because of the various and often allusive ways it has been applied (Hruby, 2001a). Some appropriations of the terms and trappings of social constructionism seem little more than window dressing for ethnographies of productive classroom practice. This is worthwhile work, but as social constructionist analysis it has been dismayingly vague. As Schoenfeld (1999) and others have complained, it is difficult to fashion testable hypothesis from overly broad definitions and overly general theoretical assertions about “the sociocultural.” On the other hand, some work in literacy education using social constructionist lenses has been exemplary, both theoretically rich and philosophically sophisticated (e.g., Blanton, Moorman, Hayes, & Warner, 1997; Rex, L. A., Green, J. L., Dixon, C. N., & The Santa Barbara Classroom Discourse Group, 1998). Nonetheless, the exceptions underscore the general tendency: a failure in most of this research to provide a precise working definition of what the social construction of knowledge entails, and scant attention to the processes of construction ongoing in the research itself.

Elsewhere, I have suggested that social constructionism can be historically and paradigmatically divided into three waves: an empirical wave in sociology beginning in the 1960s, a postmodern wave in social psychology beginning in the late 1970s, and a
new-realism wave in philosophy of mind and of science in the 1990s (Hruby, 2001b).

The use of the term “waves” in this context was perhaps unfortunate as it suggested more than that the three approaches in the study of social constructionism succeeded one another. It also seemed to suggest, in spite of my cautions to the contrary, that the earlier versions are no longer viable. In fact, all three approaches are possibly useful because they are paradigmatically distinct and therefore not commensurable (Kuhn, 1962). *Lenses* would have been the better term to describe these three ways of focusing inquiry on the social processes of knowledge formation in communities.

**A Brief History of Social Constructionism**

One of the more salient features distinguishing these three lenses is where the bounds of the social construction of knowledge are drawn. For the sociological empiricists (e.g., Berger & Luckmann, 1966) the natural world was acknowledged to include the human organism and its species-specific and species-probable traits. However, these traits were deemed to include the capacity both for language (semiotic systems) and culture (the appropriation and modification of aspects of the natural world, including those aspects directly relating to human lifeways). Hence, humans had the ability to collectively modify behavior through cultural systems built on language. The linguistic rationales, identifications, institutions, models of causation, and so on, developed within communities were matters of social construction born of the dialectic
between individual and society, a dialectic that was constrained by the natural world even as it was mediated by language.

In this, the empirical sociologists were much in line with what had been suggested already in pragmatist epistemology (e.g. Dewey & Bentley, 1949). However, many empirical constructionists had placed their theoretical focus squarely on what the common man and woman on the street took to be reality *sui generis*, something presumed to be quite different from what empirical scientists engaged in. But the pragmatists had already called this distinction into question (Dewey & Bentley, 1949), as had other philosophers of science (Kuhn, 1962; Quine, 1969; Pepper, 1948). It wasn’t long before research on constructionism in science as another variant of the same process gave way to the second wave in social constructionism.

The postmodernist social psychologists of the 70s and 80s (e.g., Burr, 1995; Gergen, 1985; Gergen & Davis, 1985; Shotter, 1993) claimed that scientific knowledge itself—and the greater-than-human world it presumed to represent—were all socially constructed. Rather than being the result of empirical observation of the natural world, science was actually the result of humans in social relations making meaning of their social and semiotic selves within historical and ideological contexts. Scientific reality, according to the postmodernists, had no more foundational or essential basis for being enshrined as inarguably factual or natural than any reformulation except insofar as it served political, ideological, or economic agendas. The numerous epistemological
problems with such an encompassing constructionism became immediately obvious to critics and eventually obvious even to proponents (Burr, 1998; Gergen, 1998).

For instance, it was difficult to explain how social oppressors were able themselves to successfully function free of the self-oppressing nature of our shared discourses and institutions. Worse, claims of oppression could be called into question as similarly being social constructions, for everything was a social construction – including the concept of social construction! This self-undermining relativism could only be deemed liberating by the most anti-rationalist among the postmodernists. Stresses between the politically driven critical theorists, literary and rhetorical analysts, and researchers in social psychology proved too great to maintain a growing critical mass in this vein, and the third wave of social constructionists began to step forward.

The new realists and neo-naturalists in epistemology (e.g., Putnam, 1987), philosophy of mind (e.g., Block, Flanagan, & Güzeldere, 1998) and philosophy of science (e.g. Greenwood, 1994) are a varied and recent lot, and it is therefore more difficult to characterize them. Suffice it to say that their positions are not simply a return to a naïve positivist empiricism, nor are they champions of reductionist, determinist, or mechanistic models of causation. Like the empirical constructionists, the neo-realists acknowledge a natural, greater-than-human world that humans are not merely in, but of. However, the new realists’ grasp of this bio-ecological relationship is considerably more sophisticated than that of social constructionists a half century earlier.
For the new realists, our ability to perceive and conceive of our world is constrained by evolved, species-probable capacities, capacities whose evolution and development carry the nature of our world (our Umwelt) within them. Those capacities are predisposed to give emphasis to levels of bio-ecological organization of long-standing species-specific significance. They thus structure our perceptions and categories through biologically-grounded qualic phenomena possessing an inherent level of base significance. By their nature, and by evolutionary necessity, these capacities for perception, categorization, and concept formation are variously plastic and adaptive to changing circumstances and can recursively mediate our categorical and conceptual distinctions in ever more sophisticated ways. Thus, our ability to construct better understandings of the world (i.e., more adaptive for a fruitful and satisfying condition), while far from simple or perfectible, is nonetheless usually serviceable and often improvable.

Like the postmodernists, the neo-realists caution against naïve suppositions about the seeming obviousness of fact or reality. Much that passes for reality is indeed a construction, especially in a highly articulated domain such as scientific research. In a limited sense, everything must be a social (linguistic) construction since everything is signified in a language that can never be the thing, perception, or conception itself (Derrida, 1976). But it is not true that every description is therefore equally (or nothing but) a social construction. Some things are more constructed than others (i.e., rationally
or aesthetically derived, less based on empirical observation). After all, if wishes were fishes, we’d all live like kings. And we don’t. So successfully negotiating our ecological surrounds, presumably on the basis of both perception and a knowledge base, must surely involve more than simply “constructing reality.” Some constructions about the greater-than-human world are more serviceable than others, and this is often demonstrable. Indeed, the purpose of science is to pursue such careful demonstrations. All empirical observation is based on qualic phenomena (sensation and memory) made coherent through theoretically-informed interpretation. It does not follow from this, however, that all observations are equally informed (let alone entirely informed) by theory, or, for that matter, that all statements are entirely informed by interpreted observation. To this end, there is a distinction to be made between epistemic and linguistic objectivity (Greenwood, 1995). Thus, we can distinguish at least two types of scientific construction: those that are attempts to signify careful observations of the natural world, and those that attempt to hypothesize causal factors not actually observed or observable, and which indeed may not exist in the natural world at all. In a word, this is the difference between naturalistic (empirical) and heuristic (rational) constructions. The psychologists Paul E. Meehl and Kenneth MacCorquodale have proposed a similar distinction between hypothetical construct (the scientific description of physical or physiological phenomena) and intervening variable (the stop-gap explanatory abstraction). The distinction in social constructionism is blurry, however, and these two
types of scientific construction are perhaps at the ends of a continuum. Still, a rifle barrel, too, is a type of continuum, so I would hedge that it is best to know which end is up when dealing with a continuum.

Failing to distinguish between when we are measuring and describing processes and systems of the natural world, and when we are constructing explanatory narratives or models of the invisible forces presumed at work animating that world is a serious categorical error. It is one, I believe, that has defined much scientific research in reading and literacy education over the past 30 years. And this ought to be a concern, for when we reify our heuristics we are led to embrace a ghost-in-the-machine or over-the-shoulder dualism that is both philosophically and scientifically unsatisfactory. Worse, we are led to stake territorial claims on what we mistake to be certainties within and of our phenomenological domain.

The Cautionary Tale of Research on the Psyche

Let us then distinguish between the scientific construction of heuristics and the scientific construction of our understanding of the natural world. The construction of heuristics is chiefly an exercise in constructing facilitative theories that allow us to rationally think about, discuss, and research things that otherwise we could not (i.e., the mind, society, unicorns, the number of angels that can dance on the head of a pin, etc.). By contrast, the construction of our understanding of the natural world is an exercise in articulating empirically observable and dependable patterns of ecological constraint and
affordance (i.e., the “laws” of nature that allow us to appropriate natural resources effectively; observations on how humans tend to use those resources, etc.). It is important not to conflate and confuse these two types of constructs.

There is a resistance to acknowledging heuristics as such once they have been thoroughly reified through the processes of social construction. Professions, institutions, careers, identities, and practices—these things take on a life of their own. Collective professional identities become as cults, their objects of inquiry fetishes, and their methodologies rituals. But the existence of such entrenched institutions, practices and professional communities is not adequate evidence of an empirical reality represented by the heuristics entertained therein. An example of entrenched institutionalization grounded on a reified heuristic might clarify what I mean.

Once upon a time, long, long ago, back before the days of the cognitive model of the mind, there was the psychoanalytic model of the psyche (several, actually). Indeed, it is worth noting that before the psyche there were religious, essentialist, empiricist, and romantic models of the spirit, the soul, the pneuma, the humors, the passions, elan vital, etc., many of which still persist in the general vernacular today (e.g., Moore, 1992; Redfield, 1993). The idea behind all of these is the same. Without some animating force, the body is presumed to be an inanimate glob of dross matter, nothing more. Historically, it was inconceivable that living things might, by their very nature, be self-animating, largely due to a legacy of essentialist, dualistic religious dogma, and to the early
scientific use of mechanistic metaphors drawn from Newtonian physics to describe biological organisms and processes in terms of distinguishable bodies and forces (Dewey & Bentley, 1949; Johnson, 1987). Something beside the body itself had to account for its behavior. The hypothetical cause was determined by the way behavioral explication was narratively justified, but the resulting explanation always suggested the causation worked the other way around. As a result, the dualism inherent in the initial assumption was presupposed in any understanding fostered by the model. This sort of circularity is an unfortunate hallmark of heuristic constructions.

In any event, one of the first major disruptions in the development of psychoanalytic theory occurred with the break between Sigmund Freud and his colleague, Carl Jung. One of the reasons for this break was Jung’s acknowledgement that Freud’s model of the psyche, with its Ego and Id and complexes and sublimations and other mechanistic arrangements, was not a description of an actual location bounded by time and space, but rather was a heuristic device. Ultimately, Jung noted, the physical mechanisms for the behavior of biological organisms such as human beings would be located in the neurophysiological substrates, but there was no way in the early 20th century to study such things. In the meantime, Jung explained, models such as Freud’s—or his own, or Adler’s—allowed researchers, therapists, and their patients to think about and talk about what would otherwise be ineffable. And this ability to
postulate and share structures of emotion and memory was in and of itself of therapeutic value (Clarke, 1992).

Freud, the logical positivist, vehemently denied Jung’s observation, decrying it as mysticism—although he himself tacitly acknowledged and tried unsuccessfully to address the problem in the 1920’s (Holland, 1992). Almost a century later, the consensus in psychology is that the success of traditional psychoanalysis is anecdotal, meager and limited to moderate emotional distress. Meanwhile, the impact of psychopharmacological interventions (based on psychobiological and neuroscientific research) has been astonishing even in severe cases of psychosis. Thus, the current trend in psychiatric intervention is based on a situation-specific blend of psychopharmacology, behavior modification, and talk therapy.

The point of this historical digression is to exemplify how easily heuristic models can be reified by even the most sophisticated of minds, and to note how such reification leads to delusions of pseudo-empirical grandiosity. More to the point, it can lead to entire research agendas, academic departments, professional organizations, publications of theory and practice, and highly lucrative professional identities fostered by heuristics that no more describe the real world than a vibrant description of the Easter bunny. Of course, every spring, countless grandparents across the land delight in the behavior modification they have encouraged as their grand children cavort about backyard shrubbery in search of painted eggs. But is that any basis for justifying a program of literacy research?
The point is, the existence of such an institutional status quo built around a reified heuristic is itself not proof that the heuristic represents causative aspects of the natural world. And the bald assertion that a heuristic must in fact represent unseen aspects of the natural world because it is useful as a heuristic makes no sense at all.

*Intellectual History Repeating Itself*

This brings us to the long and proud legacy of cognitive psychology’s influence in literacy education research. Like earlier dualistic explanations of human behavior, cognitive models rely on a stopgap, intervening explanatory device such as the psyche. That device is called the mind. The mind has a long pre-scientific history as a construct in the vernacular, so its use in psychology has a certain intuitive appeal. Models of the mind are said to account for behaviors, and research on behaviors is said to prove the validity of these models of the mind. The circular reasoning here is obvious, and has been described as “phlogiston theory” by neuro-philosopher Patricia Churchland (as cited in Churchland, 1995). (Phlogiston was an imperceptible gas postulated by fifteenth-century chemists to account for the deterioration of matter by rust and fire. The rationalists who championed this conceptual breakthrough were certain that phlogiston existed even though it could not be observed. Proof of the existence of phlogiston was to be had in the phenomena of rust and fire, the very phenomena phlogiston was supposed to explain. Similar circular reasoning allowed psychoanalysts to justify models of the psyche on the
basis of complaints, and cognitivists to justify models of the mind on the basis of behavior.)

The problem with the mind, as with other examples of phlogiston theory, is not that it makes for a poor heuristic. In fact, the mind is a very powerful pedagogic and rhetorical device. Research on the mind has allowed for important advances in educational and behavioral theory, which in turn have informed solid research. Current models of the mind are certainly more satisfying as intervening variable than the behaviorists’ black box. And the mind is destined to continue in the vernacular in the same way that constructs of the soul and of passion do today. The problem is our believing that because the mind is useful as a heuristic it must therefore represent an actual, if imperceptible, causative aspect of the natural world.

Such reifications, I suggest, entice researchers to take on the mantle of ontological certainty and thus engage in a territorial vehemence that demands and indeed fosters professional unity around an orthodoxy (as demonstrated in the case of Freud and Jung), but ultimately retards theoretical development within the profession. Such reification occurs through processes of social construction earlier described. For instance, to have challenged the hegemony of cognitive assumptions and institutions in psychology during the past quarter century would have been professionally disastrous. The more recent advances in psychology along psychobiological and neuroscientific lines has occurred thanks to an end-run around cognitive certainties that avoided openly acknowledging or
challenging them. Similarly, the development of sociocultural perspectives in literacy education had more to do with professional exhaustion by many literacy education researchers over arguments surrounding the minutia of mental processes than with a coherent critique of the inherent flaws of cognitive models (D. Alvermann, personal communication).

Again, the problem is not that the mind is “only” a heuristic. Heuristics are invaluable in advancing human understanding. Nor is the problem the cognitive choice of mechanistic (and thus reductionist and deterministic) metaphors to describe the mind. Mechanistic models are very useful at describing many things, particularly machines, and they are therefore pedagogically useful because they are easy to understand. Nor is the problem the inherent dualism presumed and promulgated through the circular reasoning commonly employed, although such dualism is generally in low repute among most current philosophers of mind (Block, Flanagan & Güzeldere, 1998).

The problem is the unwarranted assertion that the central construct is a natural fact, and thus inarguable, unmodifiable, and professionally possessable. The mind, however, does not exist in the natural world, except in so far as it can be described as a cultural artifact. This is perhaps one reason why research on the mind’s learning does not always readily translate into effective classroom practice. Theories of the mind’s structure can inspire literacy research, but it cannot displace or preempt it. Only research
on literacy learning in classrooms can tell us anything about literacy learning in classrooms.

*Intellectual History Repeating Itself Repeating Itself*

Lest those of a sociocultural stripe delight too much in this critique of cognitive psychology’s influence in literacy research, it should be noted that socioculturalists, too, have run afoul of the same problems. Because socioculturalists rely on a contextualist motif rather than a mechanistic one, the emphasis is on forces rather than structures, but the Newtonian-articulated dualism of inert bodies and motivating forces still undergirds this perspective as it has since Comte founded “Social Physics” in the 1820s.

Socioculturalists also rely on Idealist rather than Materialist philosophical positions, positing reality as a construct in the realm of ideas rather than in the natural world, but the determinism of their models is similarly manifest in their narratives (Farrell, 1996). As with psychological constructs, something other than the ecologically-situated biological organism in the process of negotiating its contextual surrounds is presumed to account for that organism’s behavior.

The contextualist motif asserts that phenomena arise from unique contextual influences or situations. The contexts of general concern are usually the social and the cultural, although linguistic, semiotic, economic, and ideological contexts are treated similarly (e.g., Gee, 1990). That which arises from such spatially and temporally unique circumstances is either itself unique (say some ethnographers and postmodernists), or
exhibits general tendencies of historical progression (say the Hegelians, Marxists, and Frankfurt School-inspired critical theorists) (Farrell, 1996; Foucault, 1978; Pepper, 1948).

Contexts are usually posited as being two-tier in nature, with an immediate, observable micro-cultural level of individuals in relation, and a higher, theoretically postulated macro-cultural level of societal forces contextualizing the micro level. Socio-historical determinists maintain that the macro socio-historical level constitutes the micro cultural level in accordance with certain presumed historical inevitabilities, which in turn constitutes individuals and gives them their sense of identity. Causation is thus basically top-down and reflects a theoretical rationale for authoritarian socio-economic arrangements. Other contextualists describe a more transactive relationship between individual agents and their immediate surround which gives rise to collective generalities that can feed back upon the lower levels of organization. In these views, agency and identity are developed recursively over time from immediate experience. Lev Vygotsky would be an example of a pioneering socio-historical determinist; John Dewey would be an example of a pioneering transactionalist (Glassman, 2001). Foucault might be an example of a postmodern contextualist emphasizing the incommensurability of historical experience.

But, again, as with the cognitivists, the central problem for sociocultural theory is not with its choice of framing motif. The problem is that socioculturalists posit a macro-
level construct—culture, the social, the socio-historical, etc.—the entirety of which would elude observation, were it to actually exist, except by way of a God’s-eye view. Human beings have never had, nor never will have, such an all-encompassing perspective. Such demiurgic macro-cultural constructs of historical destiny or cultural influence, therefore, like the construct of the mind or the psyche, by their very nature, can never be empirically demonstrated; rather, they are only rationally postulated. A non-believer might suggest that macro-cultural levels of social or discursive organization are actually abstracted generalizations based on anecdotal observation of behavior and demographic quantifications drawn from the level of immediate experience—measurements and observations undertaken and selected precisely because they bolster the presumed heuristic model of causation being asserted. Thus, the reasoning supporting these models is as circular as that employed by the cognitivists.

More phlogiston.

As with the cognitivists, the socioculturalists tend to reify their heuristic narratives as actual causative forces, and this encourages the same professional territorial prerogatives displayed by the earlier cognitivists. Indeed, a dismaying progression of parallel ideas in Western thought can be identified between those positing internal causation (the soul, the spirit, the conscious, the psyche, the mind) and those positing external causation (God’s will, fate, destiny, the zeitgeist, the world spirit, history, inevitable socio-economic progression, culture, the social, etc.). If the academic debates
between these incommensurable camps take on the tenor of religious wars, it should come as no surprise. Again, these reifications are bolstered by the processes of social construction that gives rise to institutional systems, identities, and communities of practice. And these, quite literally, apart from the posited intervening variables they entertain, are physical territories that can be fought over. And so they are.

The shibboleth that education is a social practice is often reiterated like a catechism at many a literacy conference and graduate seminar today. To observe that this is a rather banal observation is to invite professional rebuke in most quarters of the profession. To note in addition that history has not been kind to socio-historical prophecy is to provoke severe ostracization. We have not yet exhausted our recent fascination with the social, the continental, and the easy heroics of critical polemics. Thus, borrowing a page on tactics from the psycho-biologists, the best way to produce new knowledge in literacy education is to avoid challenging sociocultural and cognitive pieties altogether, and get on instead with an entirely different research agenda, one grounded in an alternative conceptual motif, staying humble until such time as it bears discernable fruit.

An Incautious Organic Conclusion

This leads us back to a justification of my original interest in bio-ecological motifs in literacy education. The current “peace accord,” on behalf of balance at RAND and elsewhere is an attempt at perpetuating the current Two-World Hypothesis approach, balancing one narrative motif against another, in an effort to preserve personal and
professional positions and legacies. This is understandable, but it can likely lead to the preservation of the reification, dualism, and theoretical turf wars endemic to our current condition. And this, I would insist, is an unhappy situation for 21st century researchers.

It would be premature and beyond the scope of this paper to speculate on just what an organic or bio-ecological motif would entail entirely. Indeed, the development of such a motif for literacy education research would be a rich area for extensive future inquiry. There are places to begin, however. Inspirations for an organicist motif might include work in philosophy (Allen & Bekoff, 1997; Block, Flanagan & Güzeldere, 1998; Millikan, 1984), activity theory (Wertsch, 1998); sociocultural dynamics (Minick, Stone, & Forman, 1993), situated cognition (Kirshner & Whitson, 1997), ecological psychology (Reed, 1996), cognitive ethology (Hauser, 1996; Tomasello & Call, 1997), developmental psychobiology (Michel & Moore, 1996), neo-connectionist models of neurological processing (Sinha, 1988; Elman, et. al. 1996), situated robotics (Clancey, 1997), and the integration of these perspectives (Bronfenbrenner & Ceci, 2000; Clark, 1997; Hendriks-Jansen, 1996).

Though informed by the life and social sciences, the organic motif also needs to be kept in mind as a heuristic. It should never be posited as an account of factual reality itself, but only as a means of promoting research on the nature of our realities.

Given the foregoing review, allow me to rather boldly make the following suggestions:
Literacy education researchers need to:

- allow for the value of heuristics as such and resist the seduction of reification;
- acknowledge that reification is a long-standing foundational problem for our theories of literacy development;
- address dualism, and accept that, whatever one’s personal or religious views might be on the subject, it has little place in a scientific understanding of learning or learning communities;
- explore encompassing motifs that can provide an idiom to include both cultural and cognitive phenomena – as well as developmental, emotional, motivational, ideological, and individual factors;
- keep in view our participation as researchers in practices that socially construct our sense of reality, and the inherent responsibilities to honesty, effectiveness, fairness, and truth such mindful participation entails.

Given these needs, and what I perceive to be the promise of organicist motifs in addressing them, I believe that bio-ecological narratives are deserving of a second chance. Only, this time around, we need to avoid half-hearted attempts and construct them for real, but not as reality.
CHAPTER 10

CONCLUSION

In the preceding eight chapters I have attempted to flesh out the dissertation I originally promised in Chapter 1. I have reviewed the history of developmental psychology, a field once ensnared in a predicament analogous to the paradigm wars in reading and literacy education research, but which moved beyond dichotomous argument to embrace and synthesize multiple perspectives (Chapter 2). This it did with the help, in part, of meta-analytic heuristics such as Stephen Pepper’s theory of world hypotheses (Appendix), and the development of epistemologically credible alternatives to the two original dominating theoretical frameworks (Chapter 2). In Chapter 3, reviewing the history of reading and literacy education research theory, I made a recommendation we try something similar and gave some examples how such an analysis might work. In Chapter 4, I briefly sketched out what the missing third perspective in reading and literacy research theory might look like, a perspective I called the socionaturalistic narrative. In chapters 5 through 9, I provided evidence of how such a theme could inform publishable scholarship, making the point that such a perspective could be both conceptually and professionally promising.
Figure 4. Reading and Literacy Frameworks
(C = contextualism; O = organicism; M = mechanism)
In this chapter, I hope to expand further on what socionaturalism implies for reading and literacy education research. As Figure 4 (p. 205) indicates, socionaturalism is informed by a contextual organicist hybrid world hypothesis. The developing reader is intuited as being a little like a living organism, a little like an historical event. This places socionaturalism squarely in the same realm as current developmental psychology (e.g., Damon, 1998; Elman, et al., 1996; Lerner, 2002; Michel & Moore, 1995). In terms of reading and literacy education theory, socionaturalism suggests a bridge between contextualist literacy theory, including Pragmatist and poststructural perspectives (Glassman, 2001; Prawat, 2002; Sumara, 1996), and organicist reading research, including developmentalist and neuroscientific perspectives (Shaywitz, Pugh, Jenner, Fulbright, Fletcher, Gore, & Shaywitz, 2000; Stuebing, Fletcher, LeDoux, Lyon, Shaywitz & Shaywitz, 2002). These two perspectives, the contextualist and the organicist, may seem to many readers like the far ends of a linear continuum. What could be farther apart than poststructuralism and neuroscience? And how can socionaturalism directly link to them both?

A simple answer to these questions might be that the socionaturalist narrative employs motifs from the life sciences and life science-informed social sciences. Thus it can talk-the-talk of the neurosciences and engage in naturalistic discourses—reminding participants in those discourses of the necessarily ecological nature of biological organisms. On the other hand, socionaturalism connects to Pragmatist education theory
precisely because of this emphasis on context. Because socionaturalism is understood
from the start as a narrative, and not an opaque presentation of fact or reality, it can
enjoin poststructural discourses accepting the indeterminacy of knowledge and the
inherently narrative structure of meaning. Of course, if pressed, most current naturalists
will agree that science does not prove a definitive reality and that their theories are
constant under revision (see Chapter 7 of this dissertation). But this allowance is rarely
evident in the published research (e.g., Stuebing, Fletcher, LeDoux, Lyon, Shaywitz &
Shaywitz, 2002). On the other hand, few educational poststructuralists would deny there
are some baseline constraints to our existence (Davis, Sumara & Luce-Kapler, 2000), but
they are cautiously vague as to what those might be. Ideally, socionaturalism
acknowledges the insights of both positions and splits the difference when it comes to
their theoretical weaknesses.

All good and well, but few reading and literacy education theorists (and fewer
researchers) can be said to inhabit either a purely contextualist or purely organicist world
hypothesis. As noted throughout this dissertation, most reading and literacy scholars
seems positioned in the mechanistic contextualist or mechanistic organicist hybrid
worldviews. For this reason, the socionaturalist narrative articulated in these pages may
seem quite a stretch, especially for those who have been enjoying perfectly good reading
and literacy scholarship located on the opposite side of the theoretical circle (Figure 4, p.
205). As can be seen, socionaturalism is certainly the perspective farthest from the
mechanistic framework that dominated the field during the glory days of behaviorism and learning theory, a perspective that still echoes in our field due to our necessary focus on the institutions of education, teaching methodology, and professional development, institutions designed by the florescent light of behaviorist assumptions.

The schools, including our teacher education departments, were designed and implemented during the 20th century’s fascination with mechanistic modernism, structuralism, and behaviorism, and their self-perpetuating design guarantees that they are not going to change on their own any time soon. I believe a reasonable case can be made that the organization of schooling and its operation is predicated upon the theoretical assumptions of mechanism—that children and adolescents are essentially reactive entities programmable for their own cognitive and social good in controlled educational environments. It is not hard to imagine why most educators prefer to assume some sort of mechanism—a reactive learner is an easier learner to handle in practice and a simpler one to envision theoretically for purposes of research. Given this, our various educational institutions attract legions of certain sorts of people to the enterprise of education—namely, those who find it a worthy thing to do to program the reactive young for their own cognitive and social good.

Nothing surprising or inherently wrong with that, except to note that if the schools were designed differently, to run along different assumptions, they would attract different kinds of people who would do different sorts of things, or at least, if the same things, do
them to different ends. Since the schools are not designed differently and do not run along different assumptions, what literacy and reading educational researchers have to work with is the current status quo. Part of what perpetuates this model is the sheer economic and administrative size of these institutions. Also, educational professionals of various stripes maintain the current institutions of schooling because such institutions foster their own professional self-definition. And they resist attempts by political mandates to restructure the schools as a natural matter of self-preservation in the instinctive, psychological sense of protecting one’s socially vouchsafed identity, although justification for this resistance never acknowledges such a motivation.

Thus, in order to remain coherent to the field, educational researchers and their theories must not stray too far from the practical, common sense business of helping to run the schools as they currently exist to best effect. For researchers, this means doing research within mechanistic, mechanistic organicist, or mechanistic contextualist theoretical frameworks. Straying from the assumptions about learning and human development upon which our educational institutions have been built looks like a fool’s off-task errand. But if the problem with our educational system is the institutions themselves, as I suspect it is, and the underlying assumptions upon which they were designed, such a fool’s errand is at least a noble and possibly a helpful gesture. I cannot hope to single-handedly do better than that for improving reading and literacy education.
The Promise of Goodies

At the start of this document, I promised that I would offer some novel definitions of common reading and literacy concepts suggested by the socionaturalist narrative. Definitions are of two types: working definitions, and speculative definitions. Working definitions in socionaturalism would include things like transactive relation, emergence, non-linear inter-nested dynamics, structural-functional causation, and so forth. We have spent considerable space identifying these in earlier chapters, so I will not reprise those definitions here. I would note there are only a few good books on these topics for educational purposes, such as Engaging Minds (Davis, Sumara & Luce Kapler, 2000). But more general and detailed works of synthesis for theorists and researchers looking for inspiration abound. A well-rounded list might include Clark’s Being There (1997), Hendriks-Jansen’s Catching Ourselves in the Act (1996), Pfeifer and Scheier’s Understanding Intelligence (1999), and Schore’s Affect Regulation and the Origin of the Self (1994). For more condensed reviews of these concepts, consult Lewis and Granic (2000), particularly the chapters by Schore (2000), Freeman (2000), and Panksepp, (2000), and Bosma and Kunnen (2001), especially the chapter by Van Geert (2001).

Speculative definitions are of those tricky concepts we reading and literacy folk think we all understand, yet can never come to any solid articulated agreement about. Were this a purely conceptual dissertation, instead of a conceptual-manuscript hybrid, I
would devote considerable attention to such definitions. As it is, I will offer only
epigrams portending larger things, koans, if you will, for a new meditation on literacy.

**Meaning:** An embodied state, not a transcendent thing, essence, quantity, or force.

The result of intentional organisms being viscerally and emotively (therefore
actively) in relational accord with their perceived ecological surrounds (including
physical, biological, psychosocial, linguistic, cultural, and semiotic surrounds),
with all of the neuroendocrinological self-regulation that requires.

Meaningfulness is an emotive and qualic state that emerges from a transactive
relationship, a resonance between the perceived self-state and surround promising
the satisfaction of desires.

**Learning:** Adaptive appropriation of percepts and memories to generate meaning.

**Comprehension:** The socially demonstrated situational assurance of
meaningfulness. Demonstrated socially by matching of perception coherently
with memory so as to achieve desires, such as a goal.

**Communication:** The expression of internal states through behaviors by an
organism and the modification of the behavior and internal states of other
organisms on behalf of facilitative coordination to generate situational assurance
(i.e., comprehension).
Language: The noises we make while trying to get what we want, as Rorty (1967) once quipped. A species-specific form of communication demonstrated by humans employing learned symbolic associations.

Representation: Arbitrary token, construct, or model indicating association employed in communication (see foregoing definition of communication).

“Reading”: Employing representations (see foregoing definition of representation).

The limitations of these epigrams when they are decontextualized in this fashion from their theoretical framework are patently obvious. So let us return to the original theme of this dissertation in search of richer conceptual applications of bio-ecological motifs to literacy and learning.

A Few Fundamental Socionaturalist Observations

Allow me to review some of the insights that can be drawn from the review of socionaturalism in Chapter 4 before gingerly applying them to learning and literacy development. These suggestive motifs can be generalized as the claim that higher-order cognitive and social phenomena can be credibly described or renarrativized as natural phenomena. This is possible because, according to socionaturalism, they really are natural phenomena, generated by bio-ecological entities (humans), and because in socionaturalism there are no credible transcendent forces—no forces, that is, that cannot,
at least in theory, be directly observed. (For this reason, socionaturalism repudiates
dualist and essentialist accounts, such as those that posit a disassociation between mind
and body, agency and behavior, or meaning and transacted representation.) We shall
review four examples of bio-ecological dynamics reflected in higher-order phenomena:
(1) the nature of what differentiates living from non-living things; (2) the trend in living
systems towards increasing complexity; (3) non-linear dynamical system effects (such as
emergence and transaction); and (4) natural selection. These four are not exhaustive of
the possible dynamics of living systems, but they should suffice to make my point.

(1) Because the intuited metaphor of the living organism or organizational form is
central to the world hypothesis of organicism, which is central to socionaturalism, it is
important to be clear about what we mean by living organizational form. After all, it was
once common in biology (and still common in some quarters) to explain living things
with the metaphor of the wet machine. But an organicist world hypothesis predicated on
the intuited metaphor of the living organism presumes that living organizational forms
are inherently different from machines. What, then, is the nature of a living
organizational form? What is life?

What separates living entities from non-living entities is this: A living organism is
a structure that has the ability to appropriate energy from its immediate environmental
surround and use it to produce more structure—in order to appropriate more energy, in
order to produce more structure, in order to appropriate more energy, and so on (Schore,
In this fashion, in their development and across generations, living organizational forms can defy the second law of thermodynamics and in effect swim upstream against the course of entropy. In other words, living organisms are structures for exploiting the affordances of an environment in such a fashion as to perpetuate the exploiting of the affordances of environments in the creation and maintenance of an organized, self-advancing system.

Put simply, this is base-line agency. In other words, agency is an inherent property of life. And because it emerges as a result of the transactive agent-environment dyad, transactive relationship between entity and surround is central in socionaturalism. Any time a living entity (such as a neuron, a human being, or a community) is involved, transactional dynamics can be found in play. Transaction in reading theory (Goodman, 1994; Rosenblatt, 1994) can thereby be understood as an appeal to natural processes at work in cognition, aesthetic response, and literacy development.

This fundamental ability of living things to create greater order from contextual affordances provides a first instance of agency. This agency—which we might term fundamental agency, as opposed to intentional (higher-order, conscious) agency—is distributed across the transactive relationship of organism and environment, and through time. This is true at all levels of living organization, from the development of a cell in response to its immediate bio-chemical surround, across the development of a multi-cellular organism in response to socio-emotional interaction, or across generations in the
evolution of a species within species-probable environments. Entities do not come to their environments; they emerge (cognitively, developmentally, or evolutionarily) within such environments and thus are of rather than in those environments.

Where and how life began is an open question—perhaps with the advent of self-replicating proteins, molecules that could appropriate energy and available material to reproduce themselves (Harold, 2001). But all evolved adaptations since, all species and their species-specific capabilities, including those of human beings, have been but developments to facilitate this fundamental agency. This also includes higher-order forms of agency such as intentional agency. Thus, conscious agency is not just a higher-order result of cognition, nor constructed by determinative cultural-historical conditions, nor the result of linguistic narrative, according to socionaturalism. It is not a ghost motivating the machine, nor the zeitgeist, but is an inherent, defining characteristic of life itself.

Agency is not locatable therefore in a particular module of the brain, or in a set of social prescriptions, but is distributed across the very structure of our flesh and its relation to its experience. Human cognition and culture, emotion and identity, consciousness and intention, are all evolved means to facilitate fundamental agency.

By contrast, agency in literacy research is often framed in terms of power relations (e.g., Butler, 1992). Agency is not assumed a priori as a natural attribute of an active learner. The capacity to act must come from outside the agent/learner (in essence as instructions to program the reactive entity, this being, I believe, the mechanistic link
between socioculturalist and cognitive stances). Individuals are said to appropriate or are taught the means to empower themselves, or to empower or disempower others. This is clearly higher-order agency, but note there is already agency at work—the agent is active in its appropriation of the means to act, something it can obvious already do. Such circularity renders such models of agency incoherent. If we substitute the term energy for power or power relations we have a clearly bio-ecological dynamic at work. Agents appropriate energy/power in social relations in order to structure a more complex and nuanced self-concept and a more complex and a more efficacious social network which can then be used in turn for further appropriation of energy/power in social relations.

(2) Fundamental agency (the appropriation of energy to produce structure) eventually leads to greater complexity of form (Harold, 2001). This does not mean that there is an inherently progressive direction to life-system dynamics. Rather, greater accrued complexity is the result of there being a bottom-line minimum level of complexity for life beyond which living systems cannot function. Random adaptive changes can therefore only accrue in the direction of greater complexity overall (although the development or evolution of any particular form or species may “devolve” towards greater simplicity if that is the most adaptive avenue of progression; consider adolescents becoming more docile in the classroom as they get older to avoid unwanted engagement with the teacher).
This is Werner’s orthogenic principle in action (Werner, 1948), the tendency in development—whether of the cells in a zygote, the synaptic connections in the cortex, the growing social networks of adolescents, or the emergence of socioeconomic specialization in cultures—to generate greater diversity over time coordinated within increasingly complex organizational forms. An example of this can be found in how our comprehension of a topic, or of the world, becomes increasingly detailed over time, and yet increasingly coherent. Therefore, through learning, development, and evolution, we can expect to see a differentiation in the ways in which energy is appropriated as well as differentiation in the structures created to accomplish such appropriation. Studies of the infant/caregiver dyad demonstrate this differentiation and integration developing over time between the infant and the caregiver in a complex interplay of perception, socio-emotional/neuroendocrinological development, and sociality that will later provide the foundation for the infant’s conceptual and cognitive development (Schore 1994, 2000). In time this leads to linguistic, cultural and further conceptual development (Blake, 2000; Budwig, 1995).

To return to our example of agency, the socionaturalist narrative claims that agency is an inherent property of living entities, which differentiate and restructure on behalf of the further appropriation of energy to produce more structure. Higher-order agency involves the structuring of a more complex self-concept that allows greater socially effective appropriation of energy/socio-emotional power. In the process, of
course, a complex social network is created which also provides a higher-order organizational form that helps regulate the social interactions of the individuals of which it consists.

(3) The increase in complexity is not a mere linear progression, however, and that is why non-linear dynamical systems theories, such as chaos theory or complexity theory, are of such value in understanding living organizational forms and their development (Michel & Moore, 1995; Thelen & Smith, 1994). Non-linearity, transaction, emergence, self-organization, and so forth—motifs we reviewed in Chapter 4—allow us to understand the constraints on structures that create more order against the tendency toward entropy. This is as true for psychological phenomena as biological phenomena (Van Geert, 2001) and may well be equally true of social phenomena (Cavalli-Sforza, 2000; Frank, 1998; Kiel & Elliott, 1996). Lower order entities in sufficient number self-organize into higher-order systems which in turn regulate the organization between the lower order entities. Efficiency of energy flow is one of the chief reasons for this self-organization.

However, self-organization or emergent phenomena can also be understood as evolved qualic distinctions of observers. That is to say, the capacity to perceptually or conceptually distinguish phenomena as such has emerged (rather than the physical basis for the phenomena itself emerging). This aspect of emergence shifts higher-order organization from a physio-phenomenological occurrence, to a perceptual-conceptual
occurrence. That is, emergence is also an evolved bio-ecological adaptation, not a magical property of matter as it is sometimes presented (e.g., Cilliers, 1998). For example, water existed long before life on earth. Yet somewhere in the evolution of animals, the qualic sensation of liquidity and wetness emerged to distinguish, in a self-representational way, the crucial nature of water from mere H₂O.

Life itself is inherently distinguishable by us and other animals from inert matter due to the importance of such a distinction for we the living. Other living entities could potentially be prey—all living things feed off other living or formerly living things—and prey are a source of energy and material for the production of further structure, which is to say our sustenance. Or another living entity could be a potential predator (we being perceived by them as prey), or it might be a competitor for sustenance. In any case, the ability to distinguish these living organizational forms categorically is an adaptively crucial distinction for life forms to make. Cross-cultural, ethological, and infant research supports the existence of such an inherent capability (Elman, et al., 1996). Such emergence need not be only an aspect of biological evolution, but also cultural appropriation. Observers may claim to perceive the emergence of stages in children’s intellectual and linguistic or literacy development, even though those stage-like shifts in behavior exhibit a great deal of intra- and inter-individual flexibility and variability. The emergence of these stages is as much a conceptual as a phenomenological phenomenon (and, indeed, the two blur). Similarly, meaning emerges from texts for the reader due to
the reader being part of a transactive relation with a textual environment. Our understanding of sociality and culture has also only recently emerged in evolutionary terms, but constrain that very sociality and culture, becoming part of it.

To return again to our agency example, the social forms that allow individuals to entertain mutually empowering/disempowering self-concepts are examples of emergent phenomena that not only exist at a higher level of organization from the individual agents in the network, but that seem clearly to be of a different order of entity. This higher order self-organization of the social agents simplifies things greatly for the individual agents, as they do not need to entirely reinvent themselves and their network of relations from scratch at every instance. At the heart of this form of organization, even in a social example, one sees that a greater efficiency of energy flow is served. This is a central tenant of dynamical system theory. Emergent forms are not magical or inexplicable; they are structured by the agent/contextual system dyad, by the efficacy of a system’s energy displacement, and by the emergent capacities of an observer of the system. Yet, as our review indicates, bio-ecological dynamics are still the basis for emergence in all these means.

(4) The inter- and intra-individual variability that allows development to proceed in an adaptive fashion, generates differentiation within coherent, self-organized systems. However, underlying the orthogenic principle is another, possibly more profound principle: the principle of natural or non-intelligent selection. Most commonly associated
with Darwin’s theory of the evolution of species (Darwin, 1871), it has also been
discovered in the regulation of the auto-immune system, synaptogenesis of the brain, and
elsewhere in the living world as we reviewed in Chapter 8. Philosopher Daniel Dennett
(1995) has termed it the universal algorithm. This algorithm involves the reiteration of a
form with slight variations, leading to differences in the success of future reiterations
given changing contextual contingencies. That is to say, iteration of form with variation
leads to adaptive selection regulated by the challenges of the environment. Thus,
differentiation serves as an engine for the higher-order processes that organize it. And
again we see that context is crucial.

Developmental psychologists (e.g., Elman, et. al., 1996; Siegler, 1996) have
proposed that this selective algorithm predicated on differences is at the heart of the
development of children’s thinking, and others (Blake, 2000; Budwig, 1995) have
recognized natural selection’s explanatory potential in children’s development of
language. Children do not just absorb ideas and words from their social surround with
their meanings intact. Instead, children mimic general approximations of association,
which initially will be highly cue-dependent and idiosyncratic. With additional exposure
to an idea or locution in varying contexts, the child in effect receives varying iterations of
the idea, word, or expression. With each attempted use, the child reiterates the idea or
locution with variation. Which of these will come closest to serving the child’s needs will
be selected for on the basis of its adaptivity (i.e., on the basis of what the child finds to be
most effective given the circumstances surrounding its potential use; Budwig, 1995).

Over time, this averages to approximate a locus of meaningfulness that will be more or less correspondent with what others employ. Surprisingly, this idea drawn from Darwin dovetails nicely with, and provides more developmental detail to, ideas drawn from Soviet activity theory and situated cognition positing that children appropriate words, expressions, or ideas from the social environment as tools to restructure their environments (Cole, Engeström, & Vasquez, 1997; Kirshner & Whitson, 1997; Reed, 1996; Vygotsky, 1986). And this reflects the intracellular dynamics of our neurological substrate.

It is worth postulating that reiteration with variation leading to adaptive selection can be the basis for a rather nuanced bio-ecological constructivism. In cognitive constructivism, the mind uses information to construct knowledge. New information is comprehended by the use of established knowledge structures, and can be added to these structures thereby augmenting those structures. In social constructivism, these structures are themselves scaffolded by the learner’s social surround. The suggestion in both cases is of an established, structured knowledge base for making sense of new information that grows with the accrual of that new information. Comprehension occurs when new information can be matched to or usefully incorporated into the existing knowledge base.

In bio-ecological constructivism, comprehension occurs at the intersection of perception and memory. (Preferring these terms to information and knowledge allows the
socioculturalist to avoid the inherent dualism and essentialism lurking in cognitive accounts.) From the socioculturalist theoretical framework, perception is not made comprehensible by fixed memories. Memories themselves are also reconstructed in order to be made coherent with what is being perceived. There is a wealth of research in the psychological literature attesting to the variability of memory (Lynn, Pintar, Stafford, Marmelstein, & Lock, 1998). This variability can occur over time due to somatic or psychological contingencies, due to socio-emotional experiences or long-standing mood tendencies, or by chance deterioration over time leading to memory drift. But for the most part, each new reiteration of a particular memory naturally varies slightly from previous ones, and because the reconstruction of a memory is directed by the current percept to be comprehended, and the somatic constraints of the knower, the variation selected will be that that is most adaptive given contextual contingencies. (This same idea has been expressed in neurological terms as neuronal group selection; Edelman, 1992).

Thus, comprehension is neither bottom-up, top-down, nor merely simultaneously interactive. It is transactively adaptive and centered on the agent-context dyad.

This suggests that free of the bounds of nature, the emotional constraints of personal relationship, or the intellectual prostheses of culture (such as texts and schooling), the constancy of our knowledge is illusory, as is the constancy of our identities, our self-narratives, and our sense of reality, truth, and free will. Were it not for the bounds provided by nature, or imposed by culture—by our environments, in a
word—our neuroendocrinological self-regulatory systems could not function. This ought not to be surprising, as they evolved precisely to allow neurologically endowed organisms to negotiate their ecological surrounds (Greenfield, 1997). The seeming constancy of our identity and reality may be an important illusion for our psychological health, and it may even facilitate social negotiation in some important ways, but if the veracity of our conscious comprehension were truly crucial for our effective behavior and survival, this situation would be disastrous. So apparently it is not crucial. Perhaps, the socionaturalist would suggest, we have been giving our linguistically mediated conscious awareness too much credit for our effective behaviors and survival. Perhaps, as others have suggested, the conscious mind is not the CEO of the corporeal body, but its in-house PR department (Churchland, 1995). Perhaps more fundamental, natural principles can account for our behaviors, even our higher-order behaviors such as our sociality, our culture, our personality and self-concept, and our propensity for language. Perhaps the effective basis of these forms is their distributed and transactive relation.

That higher-order social phenomena (e.g., texts and schooling) help correct for the fluidity of memory may at first blush seem like a cognitive and cultural advance. But it could also be argued that our linguistic, textual, and cultural surrounds have simply displaced earlier physical and biological surrounds whose natural consistency similarly helped to corral the fluidity of memory and comprehension. We have reconstructed our environmental surrounds, but the dynamics and biology of perception and memory
remain the same. And this is why fundamental bio-ecological dynamics are in evidence in those higher-order social forms. Given human biology, they have to adhere to bio-ecological dynamics in order to be at all functional. This constraint hobbles cultural relativist arguments for open-ended social transformation on behalf of abstract (therefore more socially constructed and unrestrained) goals such as equity and justice. The goals themselves are laudable (at least for us today in our current cultural-historical circumstance), but they are not likely to be attainable in just any old fashion (and possibly not entirely coherent) given our visceral needs as a particular species of bio-ecological entity.

To return one last time to our example of agency, I noted above that the higher order self-organization of social agents simplifies their agency in that they do not need to entirely reinvent themselves, their self-concept, or their social network anew with each transaction between agent and systemic context. But although the agents in such social systems never entirely reinvent their self-concept of social network, they do vary their self-concept and social interrelation with the given circumstances of a transactive encounter. Such variation allows for adaptive selection and can account, over time, for developmental changes in self-concept and historical changes in social systems (Bosma & Kunnen, 2001; Lewis & Granic, 2000)

To recap, consider again the four numbered motifs I have just described. In human perception and comprehension of perception we find fundamental agency (1), the
appropriation of energy in the immediate environment in order to create more structure in
order to appropriate more energy, and so on. Energy variances *literally* power the firing
of sensory neurons that lead to the brain and foster *literal* micro-structural changes in the
brain. For socionaturalism, this is very reminiscent of Gibson’s theory of direct
perception (Chapter 6 of this dissertation). But socioculturalists might entertain energy as
a synonym for power, while cognitivists might consider energy a synonym for
information. The bio-ecological dynamics of energy flow are still in play. In the
evolution of higher-order neurological processes that give rise to the sensory and
emotional qualia that make up phenomenal experience, we can see the handiwork of
Werner’s *orthogenic principle* (2). The simple appropriation of energy and material by
self-replicating proteins has evolved into more complex forms that have diversified for
particular types of energy—including a major differentiation between energy pickup for
negotiating the environment, and the purpose of that negotiation: to procure
sustenance—another form of energy appropriation. Yet this differentiation, which
distinguishes neurologically endowed animals from other life forms, works together to
maintain a highly complex yet coherent multi-cellular entity. The sensations, qualia,
emotions, and thoughts of our conscious experience are all *emergent phenomena* (3) that
result from this differentiation and integration. Similarly, our sociality, linguistic ability,
and capacity for culture are all evolved, emergent phenomena. And all of this can be
explained as the result of *reiteration with variation* (4) allowing for ecologically
mediated adaptive selection over vast expanses of time during which agents and
environments co-evolve.

One final caution about the dualism inherent in many mechanistically-related
accounts is in order. We articulate our understanding of natural processes using words
and quantities in the course of our scientific investigations, and words and numbers are,
of course, symbolic representations. But it does not follow from this that our symbolic
representations underlie the natural phenomena they describe. Conflating representational
descriptions with that which is being described is what is known as confusing the map
with the territory. The structures of the brain, or, more expansively, of the
neuroendocrinological self-regulatory mechanisms of our body, could, theoretically and
most probably, give rise to consciousness directly without any intermediating non-
conscious yet computable mental representations. Mental models are heuristic devices,
not actual structures in the natural world. The emergence of phenomenological
experience, the self-representation of the world in sensory and conceptual qualia
(consciousness), and the construction of linguistically mediated categories ought to be
accounted for by biological processes. Still, they cannot be reduced to those processes.
They are clearly emergent phenomena in the true sense of the word, for we experience
them as such. As Searle (1992) has noted, if consciousness was nothing more than a
networking of neurons, that is all it would be and nothing more. But our experience of the
result is clearly something more. Exactly how this works and why it evolved is something
we do not yet fully understand, it is true. And we may never. But over the past 20 years, we have made much greater progress in understanding the psychobiology of physical, emotional, and social development than we have in advancing machine models of cognition that can also account for emotion, motivation, identity, meaningfulness, and the dynamics of sociality. These topics are of increasing interest for reading and literacy education researchers and theorists. And they have been well researched over the past 20 years in developmental psychology.

Some Caveats

There are several cautions I have already noted but will repeat and extend here. First, I have not demonstrated that there is any potential pedagogic utility in this framework. I began by admitting that I would not be able to demonstrate that in this sort of dissertation, but usefulness in the teaching of reading and development of literacy is a crucially important litmus test in our field. I am mindful that, at this point, the socionaturalist narrative is just that, a narrative, one possibly embarked upon becoming a theory.

Secondly, I concede that I may have my analysis of reading and literacy positions very wrong in the sense that it addresses the disciplinary friction between only two epistemologically focused perspectives. It could be argued that there are many scholars whose work does not fit neatly into such pigeonholes. I am willing to agree with this, but
insist that such exceptions are better conceptualized if there is a larger framework within
which to situate them. The disciplinary dichotomies known as the reading wars are not an
invention of this framework, they are an assumed dilemma laid out by better minds than
mine. Thus, even if the description of the paradigm wars borrowed from several
authoritative sources in the field is an overstatement, the meta-analytic framework I
employ to get beyond it still demonstrates utility. Similarly, even if the socionaturalist
narrative itself is a misconception of how a contextualist organicist perspective could
relate to reading and literacy education research, the larger framework that took us there
is shown to be conceptually provocative.

Finally, it might be claimed that much of this is old wine in new bottles, that a lot
of what has been described in the foregoing chapters is not new. I agree. What are not
new here are many of the themes that we as a field express in our more generous
moments. The importance of diversity in thought and analysis, the value of multiple
methods in research, the pragmatic need for a wide variety of means with which reading
and literacy educators can tackle their tasks are all motifs currently entertained in reading
and literacy education. What is especially not new is everything that has not been
challenged. For instance, I have not expressed a preference for any particular research
method in a socionaturalist framework. So the reader might assume that I agree with
choosing a methodology depending on the question to be answered. Whether a researcher
working within a socionaturalist narrative employs a normative, explanatory,
experimental, or naturalistic research approach depends on what it is she is trying to understand. This seems reasonable enough as far as it goes. But the socionaturalist might wish to consider more closely the degree of theory and history to be factored into the research design.

_Criticisms of a First Pass Draft_

In response to an earlier draft of this document, my committee offered a host of worthy observations, insightful analyses, and helpful criticism. However, there was a particular group of suggestions they made with which I do not agree, but that I suspect many readers will. I therefore believe it would be useful to remind the reader of certain fundamental assumptions behind this dissertation.

(1) As noted early and consistently throughout this dissertation, socionaturalism is a theoretical narrative—it is not yet a research paradigm per se. It is at best an interpretive lens. It would therefore be premature to suggest direct application of this perspective in research design.

(2) As Pepper (1948), Kuhn (1962), Overton and Reese (1973), and others have repeatedly noted, and as I have reiterated in this dissertation repeatedly, research conducted within a particular world hypothesis is not commensurate with research conducted within other world hypotheses. Thus, the suggestion that I ought to refashion examples of extant cognitive or sociocultural research
in socionaturalist terms is inappropriate. Socionaturalism is a deliberate attempt to seek out a theoretical framework based on a world hypothesis quite distinct from those that currently dominate our field. To attempt translation of alternative paradigms by its light is to invite incoherence. The world hypothesis within which any research is designed, conducted, and interpreted has everything to do with that design, pursuit and interpretation. This does not mean we cannot entertain ideas generated within other world hypotheses. If we keep in mind the world hypothesis from which we make our judgements, and the world hypothesis in which the ideas we judge are located, we can appreciate and respect the differences. Some interesting synergies could develop out of such mindful appraisal. But it is inappropriate to critique and posit corrections of an idea in one world hypothesis from the perspective of another. I invite the reader to revisit the Appendix of this dissertation on Pepper’s theory of world hypotheses and in particular his maxims on what is and is not philosophically appropriate in cross-hypothesis analysis.

(3) As also noted earlier, socionaturalism is not trying to displace the currently dominant perspectives in reading and literacy education research theory, but to compliment them. To attempt to refashion cognitive and sociocultural work in reading and literacy research would be a flagrant attempt to demonstrate how socionaturalism could indeed displace these paradigms. For reasons
noted in (2) above, this is not possible, but, more to the point, it is not
desirable because of the disciplinary animosity it could possibly incite.

Having made these points, I must admit that I am sympathetic with any reader’s
impatience with the preliminary nature of this work. The ability to employ this theoretical
framework to fashion a grant on behalf of the study of reading comprehension, how best
to teach it, and how best to conceive of reading comprehension and literacy
development—to take one proffered example—would be marvelous, but at this point
premature. Nonetheless let me make a few suggestions.

First, a bio-ecological analysis of literacy development and comprehension would
probably suggest that reading comprehension cannot be taught, it can at best be fostered
(Biddell & Fischer, 1998). That is not a minor difference of emphasis, and a working
definition of comprehension by the light of developmental socionaturalism is in order to
explain why this would be. Comprehension is not something that can be facilitated with a
few quick strategies. Memory is a vital component in comprehension, and if the reader’s
life or educational experiences have been insufficient to bring recognizable patterns of
meaning to the text—if the text, in other words, is unsuitable for the reader—no quick fix
is going to help. Emphasis on long-term education and life experience, and careful
selection of appropriate texts for the learner’s zone of proximal development are in order.
On the other hand, perception is also an important part of comprehension, and if
perceptual acuity—perspicacity—can be improved with the use of taught strategies, as it
possibly can, there should be no doubt that measurable improvement in reading comprehension can be deliberately fostered in the schools.

Second, reading and literacy education researchers would do well to review developmental work thoroughly both in general and on the question of comprehension starting with advanced mainstream texts (e.g., Bornstein & Lamb, 1999; Damon, 1998; Leaner, 2002; Lewis & Granic, 2000). These works treat the development of individual differences, emotion, personality, identity, and sociality in terms of the bio-ecological dynamics I have been recommending in this dissertation. They therefore not only provide examples of how these dynamics can be applied to learning and development; they also provide state-of-the-art science on issues currently of interest in reading and literacy education.

Third, a grant on this topic should start with a focus on the immediate sociocultural context of reading comprehension understood as an ecological surround. This focus on context should be shorn of all ideological advocacy and other political baggage guaranteed to incite animosity from the current conservative administration and, not incidentally, leave mainstream citizens and rank and file educators cold. Political realities aside, an understanding of bio-ecological dynamics is in no way improved by political demagoguery. Contexts should be understood as ecological environments, not as ideological commitments.
Fourth, having staked out classroom ecologies as the focal point for factors that foster reading comprehension, the study should be given teeth by ample inclusion of developmental studies of socio-emotional and identity development and its relation to language and social development. By this, I mean largely work from developmental psychology, not the viscerally and emotively ungrounded sociocultural attempts to date in reading and literacy education. This developmental work should not only be evident in the literature review, it should also help to explicitly inform working definitions and research design. Reading and literacy researchers will find this work rich, plentiful, and varied. But, again, it should not be selected only in so far as it appeals to dialectical biases or traditional sociocultural orientations in reading and literacy education research. That is a very different paradigm. For the grant to be credible as a socionaturalist perspective, informing scholarship should be selected for its coherence with the bio-ecological motifs reviewed in this dissertation, and which are evident throughout current developmental research. Such an emphasis would go a long way towards trumping any concerns about the study’s scientific merit. Bear in mind that the government is offering good money to scholars who can demonstrate the hallmarks of scientific research. Even medical doctors are making their way onto national reading and literacy panels because they are perceived as being more scientific than teacher educators. So, if reading and literacy development scholars do not rise to the occasion of becoming conversant in a
naturalistic discourse, developmental, cognitive, and neuro-psychologists will. And, in fact, they already are.

What Socionaturalism Can Do Now

Beyond the general suggestions above on how to write a socionaturalist grant, allow me to suggest three helpful things a socionaturalist lens or narrative might do.

(1) It could provide a rhetorical move to best those claiming to be doing real science in reading by actually employing a current scientific paradigm from developmental psychology and the other natural and social sciences informing socionaturalism. I fear reading education is becoming a dumping ground for old school cognitive research paradigms that are no longer viable (or fundable) within mainstream psychology, if the content of mainstream APA journals is any indication.

(2) It could update reading and literacy education research and align our field’s theoretical perspectives with what is current in the other social sciences. Old school cognitive psychology is not the only legacy of the 1970s weighing on current reading and literacy education scholarship. The ideological dogmatism that has swamped most of our mainstream professional and research journals locates our field as a backwater of third-hand, Frankfurt school anti-capitalist critique and quasi-postmodernist relativist sophistry. This hardly puts reading and
literacy education on the cutting edge or even near the mainstream of current social science frameworks—or anywhere else the average parent, taxpayer, or voter would recognize as the world their children face. An ideological backlash to this bias in teacher education is in part responsible for the government’s mandated return to yesterday’s cognitive psychology. Moreover, the current situation in reading and literacy education, wherein only two psychologists from the 1930s (Piaget and Vygotsky) are presumed to have anything to say worth noting about human development, undermines the field’s credibility as an academic discipline. Does the reading and literacy education research community really believe that nothing new has transpired in developmental psychology in the last seventy years? Or, having taken a peek or two (e.g., Anders, 2001; Clay, 1991; Ehri, 1994), has it decided to stand Canute-like against the changing woof and warp of historical circumstances? I believe it is time to construct a neo-naturalist discourse along the lines of the socionaturalist narrative in order to bring reading and literacy education research into the 21st century.

(3) The socionaturalist narrative might possibly broker a larger, more inclusive disciplinary discourse to address the divisiveness of the reading wars. As I have attempted to describe above, individual, developmental, and social aspects of agency can be addressed using the same bio-ecological dynamics of living organization. As noted, if we can recognize energy, to take one example, as
equivalent to social power, or the informational content of symbolic representations, we have the basis for a lingua franca of dynamics that both sociocultural and cognitive reading and literacy theorists can share, at least part of the time.

**Closing Thoughts**

Is whole language a socionaturalist, or at least contextualist organicist perspective? After all, whole language advocates write of holistic approaches to the classroom, and claim that students can learn reading naturally with appropriate exposure to literacy-rich environments (Goodman, 1994; Gunderson, 1996). They also stress the incommensurability of the paradigm within which whole language has been conceived, although they are dismayingly vague as to why that should be. I think whole language is a contextual organicist theory of literacy, but not a socionaturalist one, although I would have to let whole language advocates speak for themselves. Socionaturalists, as I envision them, would be equally as sensitive to individual differences and contextual factors as whole language advocates. But a socionaturalist narrative is far more comfortable taking on the rhetorical mantle of naturalistic discourse than are the discourse participants of the whole language work I have read (e.g., Froese, 1996; but see Goodman, 1994).

Of course, it may very well be the case that given educational methods that work under most circumstances, any theoretical perspective or narrative that allows for their
effective appropriation and application would suffice. Most teachers are pedestrian pragmatists in that regard (Stahl, 1997), and for that matter, so are a lot of reading researchers (Stanovich, 2000). This suggests that all of our theoretical frameworks are just narratives for making sensible what we do. It is not enough that we do what we do effectively, we need also to do what we do meaningfully, and that meaningfulness needs to be both credibly correspondent, and inherently coherent. But if this were all there was to theory—and I am not certain it is not—it would be hard to account for the history of theoretical traditions as anything other than a succession of institutional fashions. But I doubt that the growing coherence of syntheses in the life sciences, and those social sciences informed by the life sciences, are merely a fluke. Of course, the socionaturalist narrative offers a naturalistic explanation of why the visceral, emotive urge toward the meaningful (over the merely true) is a fundamental dynamic in intellectual development.

My own particular research interest is to apply the socionaturalist narrative to adolescent readers and learners. The burgeoning body of theoretical and qualitative scholarship in the field of adolescent literacy is impressive (e.g., Alvermann, Boyd, Brozo, Hinchman, Moore, Sturtevant, 2002; Alvermann, Hinchman, Moore, Phelps & Waff, 1998; Wigfield, Eccles & Pintrich, 1996). The conceptual, emotional, social, and cultural complexity of adolescents’ lives begs for a research frame that can capture the numerous causative and operational factors without recourse to simplistically reductive
quantitative averages or the chaos of unconstrained multiplicities. As Pintrich (1994) has noted:

… we may not need many studies of the different components in isolation in the future, but rather we need to develop theoretical models and research programs that take a more holistic and integrated perspective on motivation, cognition, and conation. This type of research will begin to develop models and metaphors that move us beyond just listing or taxonomy of important components, to provide us with insights into how the components operate in a systemic way. This is no easy task, and the researchers will have to struggle with issues of clarity, and precision, but the time is ripe for research that takes a broader and more theoretically integrative perspective. (p.141)

Such is the goal of the socionaturalist narrative.
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APPENDIX

SOME PHILOSOPHY OF SCIENCE STUFF

There has been a great deal of confusion in reading and literacy education, as in many other fields, over just what it was that Thomas Kuhn (1962) was getting at in his *The Structure of Scientific Revolutions*. Given this and the fact that most people in reading and literacy have never heard of Stephen Pepper (1948), it might be helpful for us to brush up a bit on some of the philosophy of science stuff alluded to in the main text. I will here briefly review Kuhn’s ideas, which I assume the reader has at least heard of, and then explain in greater detail Pepper’s anticipation of these ideas in his theory of world hypotheses.

*Thomas Kuhn: On the Social Construction of Scientific Reality*

Thomas Kuhn’s *The Structure of Scientific Revolutions* (1962) is one of the watersheds of metatheoretical analysis in the philosophy of science, describing how scientific research proceeds historically. Scientific research is not an on-going accrual of proven facts, Kuhn claimed, but rather a progression of theoretical constructs researched within particular paradigms, or worldviews. These paradigms were themselves predicated on key metaphors accepted by consensus within a field as best for explaining or describing a phenomenon.
Kuhn’s influential work has been interpreted—perhaps over-interpreted—in some rather extravagant ways through the years, so I will attend to it in some detail. In *The Structure of Scientific Revolutions* (1962), Kuhn reviewed the history of Western science and came up with a developmental trajectory for the institutions of scholarship. In the beginning, an immature discipline struggles to identify structuring theories to make sense of the phenomena it wants to study (Kuhn, 1969, Hoyningen-Huene, 1993). These potential paradigms are almost always drawn from commonly understood exemplars appropriated as metaphors. For instance, during the early 18th century, self-described “electricians,” put forth a variety of theories to describe the nature of electricity. It was variously described as corpuscles, fluid, flows, or waves. Each of these models had limitations; the paradigmatic metaphor never quite fit observed nature exactly. With no dominant paradigm to lend coherence to investigation of electrical phenomena, all approaches could seem equally relevant and the discoveries were fairly random.

When a discipline settles upon a paradigm (in the case of electricity, the 18th century winner was Benjamin Franklin’s), it is not because that paradigm suggest answers to all of the issues related to a phenomenon, but because it suggests more than most competing theories. At that point, the questions worth asking and how they can be answered are constrained by the paradigm. Normal science proceeds effectively to elaborate and refine the paradigm in a methodologically coherent fashion, and the discipline can be thought of having the consensus necessary to indicate maturity. And all
goes well until nearly all possible refinements and extensions of the paradigm are explored and yet knotty questions about the phenomenon hitherto unattended remain. This begets a crisis of theory; some scientists try to force the extension of the paradigm; others turn to philosophy for new conceptual frameworks. Until a new paradigm can be fruitfully posited, things stay very much in disarray; extraordinary science becomes the rule.

When a new paradigm is finally settled upon, it again does not fit all aspects of a phenomenon perfectly, but it addresses most questions and previous findings and thereby restricts inquiry to allow for more effective normal research. Initially a paradigm is little more than a suggestion predicated on a metaphor, but as normal science once again begins to regain its focus, the paradigm becomes ever more refined, and the cycle continues (Kuhn, 1969; Hoyningen-Huene, 1993).

According to Kuhn, science as the reasoned interplay of rational theory, careful observation, and logical analysis proceeded historically through scientific revolutions, or major theoretical shifts. These were described as periods of extraordinary science (i.e., paradigmatically eclectic, rather than paradigmatically consistent, as in normal science), precisely because doing normal science within a paradigm successfully led to crises of interpretation. Such crises eventually led to a change of paradigmatic metaphor. Although Kuhn termed such paradigm shifts scientific revolutions, many paradigm shifts were only quiet in-house affairs and not revolutionary in the sociopolitical sense. Moreover,
according to Kuhn, paradigms were matters of disciplinary consensus. It is unclear
whether a paradigm, in this sense, could be proposed, posited, or heroically declared by
someone in antithetical relation to the mainstream.

Kuhn’s epistemological speculations were necessarily tentative, basic in their
constructivism, and aimed at positivism’s and even conventionalism’s prevalent pre-
Kantian (empiricist) realism (Overton, 1984). Kuhn was said to have enjoyed his critics
more than his supporters, and expressed embarrassment at the more outlandish claims of
his admirers, including Richard Rorty (1999). In fairness, Kuhn, by his own admission
(Kuhn, 1969, “Postscript”) was not always entirely clear about what he meant,
particularly on the more difficult matters of epistemology into which his historical
account strayed. By one account (Masterman, 1970), Kuhn gave 21 different definitions
of the term paradigm. He was thus easily misread (Gergen, 1998b; Greenwood, 1994;

To sum up, Kuhn offers us a theory of scientific advance through the facilitative
constraints of paradigmatic inquiry, providing us a model by which we can understand
interpretive crises. When programs of inquiry within a discipline conflict on numerous
issues, paradigmatic incommensurability may be at fault. Just how to determine if this is
so was suggested by Stephen Pepper.
Stephen Pepper: A Theory of World Hypotheses

Many of Kuhn’s ideas were anticipated twenty years earlier by Stephen Pepper, a mid-20th-century American philosopher, in his work on metatheoretical analysis (Pepper, 1948). Pepper’s theory of world hypotheses suggests that it is the nature of human inquiry, as evidenced in philosophy, art, or science, to negotiate categories of experience or observation from within larger theoretical positions. The highest level of theoretical construct he called world hypotheses. Paradigms, global theories, disciplinary matrices and so on were located within particular world hypotheses, and for the sake of heuristic utility the number of world hypotheses could be considered limited. Pepper identified eight world hypotheses, five of which he deemed suitable to scientific inquiry. According to Pepper, each world hypothesis is grounded in its own metaphysical “root metaphor” (Pepper, 1948, p. 84) about the nature of reality. Thought about particular phenomena is guided by these structures, not in the determinative sense of the Sapir-Whorf hypothesis (Bolinger & Sears, 1981), nor the interpretive sense of narrative analysis (Sarbin, 1998), but in the derivative sense of how we may be conceptually directed by a meaningful trope (Johnson, 1987). According to Pepper, the intuited metaphor structuring a world hypothesis is as much responsible for the theories that direct our data collection as is the nature of the phenomena under investigation.

Below, I will review in some detail three aspects of Pepper’s work. First, his concept of structural corroboration as a necessary compliment to multiplicative
corroboration in positivistic research; second, his *theory of world hypotheses* grounded in root metaphor and the five relatively adequate world hypotheses he identified; and third, his *four maxims* for analyzing arguments in theoretical position and debate.

*Pepper’s Structural Corroboration*

Discontented with what he perceived as the philosophical anemia of dogmatic materialism, positivist methodology, and behaviorist psychology, Pepper posited a complimentary basis to simple evidence testing, which he termed *structural corroboration*. Instead of drawing together corroborative evidence for a single theoretical posit, structural corroboration drew together qualitatively different observations about a structured conceptual description, theory, or model from which posits could be drawn. Structural corroboration attempted to corroborate *the theory connecting the evidence* (rational danda), rather than corroborate the evidence itself (empirical data). A list of synonyms for danda might include theoretical framework, conceptual domain, concatenated theory, disciplinary matrix, paradigm, or thematic narrative. Pepper offered a coherence theory of truth, but one friendly to correspondence theories of truth (cf. Stanovich, 2000, p. 371; Alcoff, 1996).

Structural corroboration and the models it produced determined what sort of data were gathered in scientific inquiry, claimed Pepper, for only data that were potentially pertinent for a given theoretical framework were pursued. (Twenty years later, Kuhn was to make this same point.) Evidence testing and structural corroboration were
complimentary, according to Pepper, one an empirical pursuit, the other rational, and both were employed for mutual support in the pursuit of more dependable knowledge whether positivists admitted it or not. Simultaneous concerns were prompting Karl Popper’s conventionalist arguments, better known among quantitative educational researchers, on behalf of a hypothetico-deductive falsification method (Popper, 1959; but see Quine, 1969).

Pepper’s World Hypotheses

The central thesis of Pepper’s World Hypotheses, A Study in Evidence (1948) was that the global theories, danda, paradigms, or narratives we employ in structural corroboration are located within larger metatheoretical structures usually grounded in metaphors taken from our common experiences and which inform our common sense assumptions. As these assumptions are confirmed through the accumulation of empirical data (evidence) and rational danda (theoretical models), they are integrated into global theories that can be applied by functional analogy to a wide range of subsidiary matters (this being one of Kuhn’s definitions of paradigm: paradigm as exemplary case). Through continual examination and analysis within the constraining assumptions of the operative world hypothesis, these global theories or paradigms become ever more refined, extended, and precisely articulated. Pepper suggested this process was at play in all human expressive forms—science, art, philosophy, spirituality—for it was the inherent nature of the creative human intellect to so operate. However, not all world hypotheses
were adequate for scientific inquiry. Relatively successful world hypotheses are those grounded in a particularly resonant common sense simile or “root metaphor” found to be pertinent to the phenomenon under investigation. Such an intuitive metaphor both constrains and suggests the nature of possible theoretical elaboration. *Root*, as used here, refers to the unseen source of a plant’s nourishment, for these guiding metaphors are rarely acknowledged, even as they are employed, hence their powerful intuitive nature.

Skepticism and dogmatism Pepper deemed entirely out of the bounds of the scientific method, and mysticism, animism and transubstantiation were rejected as world hypotheses because they were inadequate in terms of precision (detail of application) or scope (breadth of application). In this way, Pepper argued, theories could be judged for scientific adequacy in terms of the world hypothesis they presumed. But Pepper initially identified four world hypotheses that had proven historically adequate for philosophical and scientific inquiry in Western culture. Each had particular strengths but also particular weaknesses, as each were only variously sufficient in terms of either precision or scope. The four world hypotheses he identified were formism, mechanism, contextualism, and organicism (Pepper, 1948). Subsequently he identified a fifth world hypothesis, selectivism (Pepper, 1967).

*Formist* hypotheses are based on the organizing metaphor of similarity—identity of a class based on many individual examples, usually displaying a certain measure of constrained variation. Formism analyzes elements in term of their classifiability, and
schemes of classification for making sense of the world are examples of theories constructed within a formist hypothesis. Formism is both analytic, focusing on particularity, and dispersive, meaning it can be widely applied, but not with much precision, as the result is largely tautological. (e.g., Tulips are of the class spring-blooming-flowers by virtue of being flowers that bloom in the spring.)

Mechanism is grounded in the metaphor of a simple machine, an object that functions linearly in accordance with general laws of relationship, where the whole is merely equal to the sum of the parts, and whose elements can be disassembled and reassembled so that their interactions can be understood. Mechanism is also analytic, but it is integrative, fitting elements together into a single model, rather than reiterating a classificatory system across a domain. As a result, mechanism is very precise, but it lacks scope as a world hypothesis because too many aspects of the world, or of a domain, fall outside of its mechanistic explanations.

Contextualism relies on the root metaphor of the historical event, in the sense of a unique unfolding within a particular situation or contextual inscription. Novelty and change are the basic categories of contextualism. Like formism, it is a dispersive theory, reiteratable anywhere (in any location), but therefore lacking precision (for every location, like every category of formism, is unique onto itself). Unlike formism, however, it is a synthetic rather than an analytic theory, in that the parts of the hypothesis must come together to function as a heuristic, not be analyzed individually as in mechanism or
formism. The situated whole emerges from the synthesis of contextual factors but is greater than their sum, and thus not reducible to them.

*Organicism* uses the living organism as its intuited metaphor. It, too, is synthetic, like contextualism, and is therefore non-reducible, but, like mechanism, trades scope for greater precision, by trying to incorporate everything into a single consistent system, and thereby allowing too much phenomena to fall outside of its embrace. Pepper’s metaphor of the living organism, it should be noted, is drawn from teleological 19th century models informed by historicist philosophy. Indeed, Pepper’s examples of organicist philosophers are all Hegelians. On this score, Pepper expressed some prescient concern whether organicism, as thus constructed, actually qualified as a world hypothesis in its own right, or whether it was a variant of contextualism. But he preserved it as a separate category because of its unique holism.

Subsequently Pepper (1967) identified a fifth world hypothesis, *selectivism*, to which he dedicated much of his career until his death in 1972 (Harrell, 2001). Pepper noted that mechanism and contextualism seemed to compliment one another very well and so it was tempting to match them, but he insisted that mixing and matching ideas from distinct world hypotheses in order to compliment their strengths and stanch their weaknesses often led to philosophical confusion. The two metaphors competed for organizational coherence, the two unrelated metaphors suggesting that the phenomenon under investigation was a little of this and a little of that, generally with little consistency.
Selectivism seemed a way to provide what the combination of mechanism and contextualism intimated, with a dash of organicism thrown in. The root metaphor here was the purposive, situated act, and one of the basic categories it generated was that of the actively discriminative agent. This agent was understood to learn its actions by virtue of environmental encounters. Such agent-situation interaction trained up a value system that informed the agent’s future choices, an idea inspired by the research of Edward Tolman and his colleagues on cognitive maps (Efron, 1982). In a sense, then, Pepper’s theory of world hypotheses and structural corroboration is itself a selectivist approach to the history of ideas and scientific inquiry. Additionally, Pepper’s selectivism can be seen as a 20th rather than 19th century organicism. The irony, however, was that Pepper applied this world hypothesis inspired by experimental psychology to aesthetic philosophy and art criticism, and, unlike the other four world hypotheses, it went unremarked by developmental psychologists.

*Pepper’s Four Maxims*

Pepper’s five hypotheses were not meant to be exhaustive of all possible adequate world hypotheses, but these five were the ones Pepper’s historical review demonstrated to his satisfaction as having had broad use. Pepper’s development of these hypotheses was not a case of typology for its own sake; his descriptions of the relationship between these perspectives were nuanced, and he offered only a few illustrative examples of which well-known philosophers would be categorized in each world hypothesis. More
significant than Pepper’s descriptions of the world hypotheses themselves, however, was his use of them to analyze theoretical positions and philosophical argument for coherence or the lack thereof. Following are the four maxims Pepper drew from his analysis.

1) *A world hypothesis is determined by its root metaphor* (Pepper, 1948, p. 96).

2) *Each world hypothesis is autonomous* (Pepper, 1948, p. 98). From this it follows that:

   a) It is illegitimate to disparage an interpretation constructed within the categories of one world hypothesis in terms of the categories of another—if both hypotheses are equally adequate for the purposes to which they are put (p. 98);

   b) It is illegitimate to assume that the claims of a world hypothesis can be established by demonstrating the short-comings of other world hypotheses (p. 100);

   c) It is illegitimate to subject world hypotheses to the standards (or limitations) of empirical justification—world hypotheses are conceptual tropes, not literal descriptions, although they serve a crucial heuristic purpose in scientific inquiry—for all empirical data must undergo theoretical interpretation within one or another world hypothesis (p. 101);

   d) It is illegitimate to subject world hypotheses to the assumptions of common sense—common sense itself is always already located within a particular assumed world hypothesis, although one rarely articulated with sufficient emphasis to be recognized as such by the average user (p. 102);
e) It is convenient to employ common-sense concepts as bases for comparison for parallel fields of evidence between world hypotheses (p.102);

3) Mixing and matching ideas from different world hypotheses is confusing (p. 104).

4) Concepts that have lost contact with their root metaphors are empty abstractions (p. 113).

It is worth reviewing these axioms with the reading wars in mind. Axiom 1 prompts us to consider what root metaphors are operating in these debates. Conflicting metaphors would indicate conflicting world hypotheses, and thus authentically incommensurable paradigms. Axiom 2a & 2b are at the heart of the incommensurability issue, and they are possibly the two rules of conduct in analysis and debate most ignored in the paradigm wars. Axioms 2c & 2d build upon 2a & 2b, asserting the futility of appeals to formal or informal refutations of ideas located within other world hypotheses because of the impossibility of an objective locus from which to make such critiques.

Axiom 2e, however, offers a basis for translation across world hypotheses on behalf of problem solving and issue raising by way of cautious common sense comparison. Axiom 3 warns us about balanced or eclectic compromises, but it doesn’t dismiss the possibility of such compromise altogether, particularly if it is conducted mindfully. And axiom 4 warns us to keep our world myths currently and credibly informed.
In Short

Pepper’s theory gives us five examples of the sorts of categories we might find useful in any metatheoretical analysis. But, of course, we are not bound to just these five. Since Pepper’s five world hypotheses taken together do not represent any metaphysical assertion about the way the world really is, we are free to generate new ones, or to modify Pepper’s as required, provided we keep in mind the need to attend to their precision and scope. Changes in our understanding of what constitutes a living organism due to culturally acknowledged advances in the life sciences, for instance, might require us to update organicist perspectives. But, of course, we are not bound to uphold a cosmological perspective either, so, following Kuhn’s notion of paradigm in the disciplinary sense, we can consider world hypotheses as merely disciplinary hypotheses (how reading is, or how learning is, etc.), while preserving the tropic nature of theory construction they imply. Pepper’s only metaphysical assertion is that we do indeed use such metaphor-based hypotheses for heuristic and mnemonic purposes.