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.

INDEX WORDS: Literacy, Reading, Socionaturalism, Socionaturalist Narrative, Development, Self-organization, Dynamical Systems, Bio-ecological, Mechanism, Contextualism, Organicism, Naturalism, Stephen Pepper, World Hypotheses, Reading Wars, Theoretical Frameworks, Philosophy of Science, Poststructural Epistemology.

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Dedicated to

John Franklin Hruby, Ph.D.

1914-1993

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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

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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 advocatory. 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 the1970s*. 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,

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FIGURE 1. THE THEORETICAL CIRCLE
(C-O = Contextual Organicism; M-C = Mechanistic Contextualism;
M-O = Mechanistic Organicism)

C-O
(Socionaturalism)

Contextualism
(Poststructuralism)

Organicism
(Developmentalism)

M-C
(Socioculturalism)

M-O
(Cognitivism)

Mechanism
(Behaviorism)
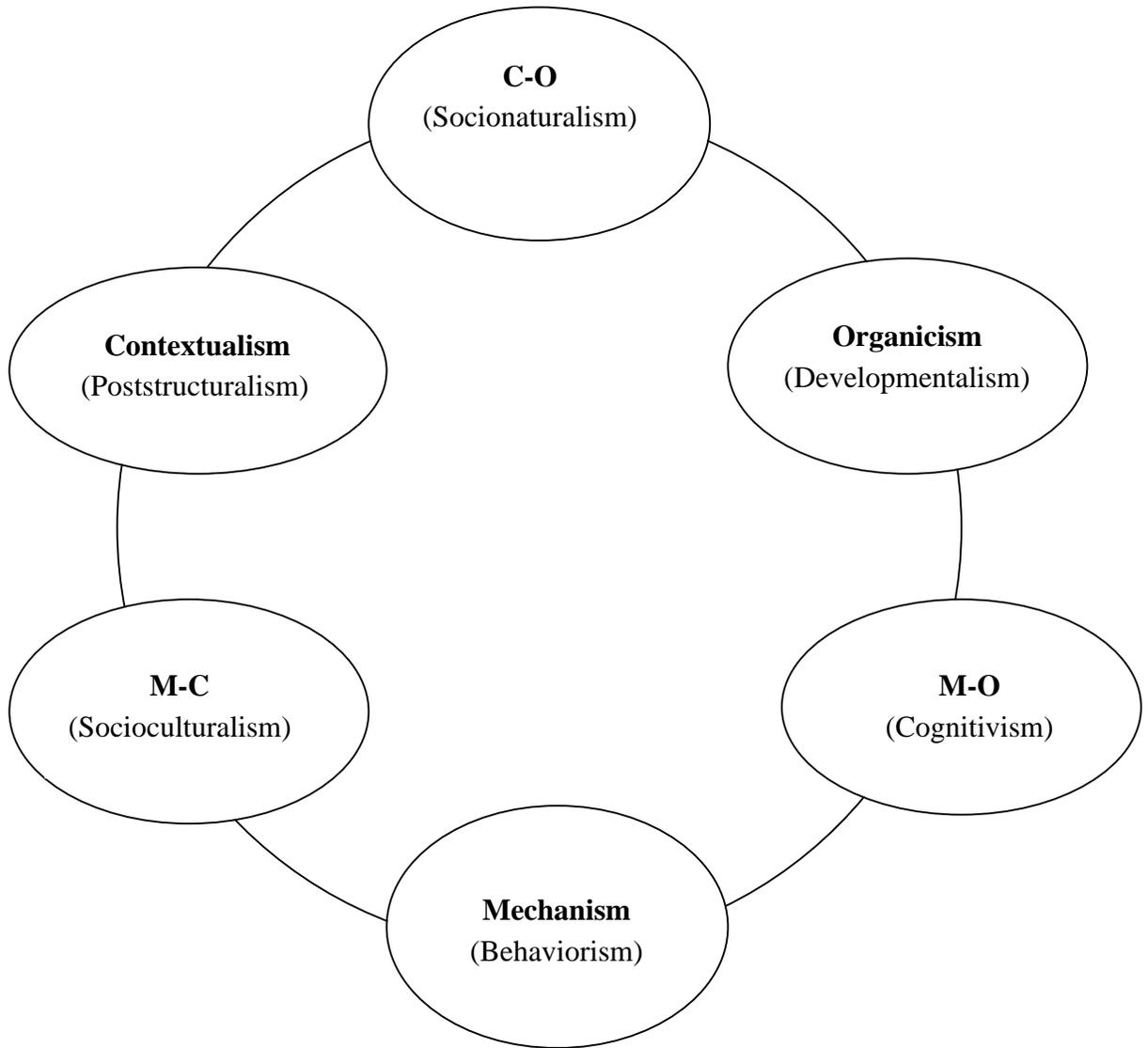
2000). This seeming variety seems especially impressive to those who spend all their time in its midst and thus rarely attend to the cornucopia of ideas to be found elsewhere in the academy.

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

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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 fozzilized 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 set, 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*

organicism, 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

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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

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

A HISTORY OF THEORY IN DEVELOPMENTAL PSYCHOLOGY

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,

1984, 1998; Reese & Overton, 1970). 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

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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)

Models   **Theories**

Intuited Metaphor   Worldview

General Model   General Theory

Pragmatic Model   Pragmatic Theory

Scale Model   Testable Hypothesis
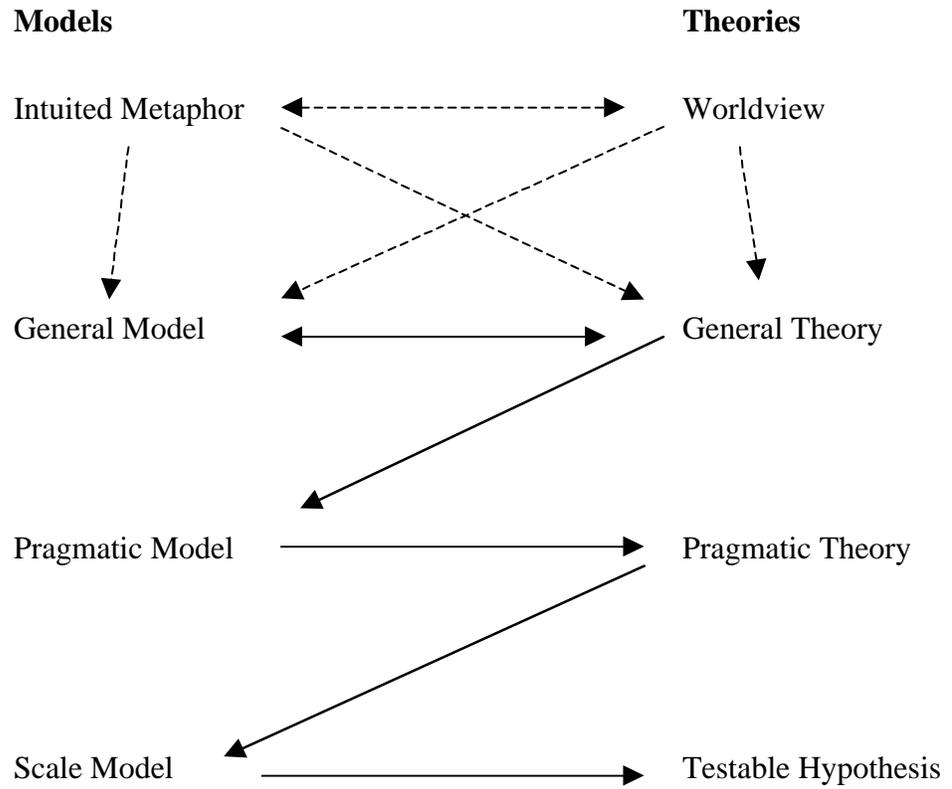
… [V]arious metaphysical and epistemological models form the determining

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)

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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 metatheorists 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,

2002). 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

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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.

CHAPTER 3

A HISTORY OF THEORY IN READING AND LITERACY RESEARCH

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

65

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

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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 -> R became S -> r_m -> 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

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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

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expanse 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 organcist 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

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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 syntheses (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

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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

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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

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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,

1999; Clancey,1997; Clark, 1997; Hendriks-Jansen, 1996). 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 multicellurlarity 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

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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 emrely 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,

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FIGURE 3. INTERACTION VERSUS TRANSACTION

Interaction	**Transaction**
Mechanistic	Organic
Linear relations	Recursive relations
Sum of parts equals whole	Whole greater than sum of parts
Antecedent-consequent causation	Structural-functional causation
Reductive analysis	Dynamical analysis
Level field or Russian Doll structure	Multiple levels in evolved relation
Static	Emergent
Organism <u>in</u> environment	Organism <u>of</u> environments
Environment is constraining or deterministic	Environment is probable, complicit, and informative
Agency requires external motivation	Agency is inherent, distributed, and proactive
Reiterative	Generative
Interactive system	Transactive system

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. Not withstanding 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

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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[1]

[Jensen, E. (1998). Teaching with the brain in mind. Alexandria, VA: Association for

Supervision and Curriculum Development. (133 pp., $21.95 paper, ISBN 0-87120-299-

9).]

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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[1] Hruby, G. G. (1999b). *Roeper Review, 21*, 326-327.
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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:

Cairns-Smith, A. G. (1996). *Evolving the mind: On the nature of matter and the origin of*

    consciousness. Cambridge: Cambridge University Press.

Churchland, P. M. (1995). *The engine of reason, the seat of the soul: A philosophical*

journey into the brain. Cambridge, MA: MIT Press.

Edelman, G. M. (1992). *Bright air, brilliant fire: On the matter of the mind*. New York:

Basic Books.

Greenfield, S. A. (1997). *The human brain: A guided tour*.. New York: Basic Books.

Ornstein, P. (1997). *The right mind: Making sense of the hemispheres*. New York:

Harcourt Brace & Company.

Posner, M. I. And Raichle, ME. (1997) *Images of mind*. New York: Scientific American

Library.

CHAPTER 6

THE BIOFUNCTIONAL THEORY OF KNOWLEDGE AND

ECOLOGICALLY INFORMED EDUCATIONAL RESEARCH[2]

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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[2] Hruby, G. G. (2000a). *The Journal of Mind and Behavior, 21*, 97-103.
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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

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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

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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 RESEARCH[3]

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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[3] Hruby, G. G. (2001a). *Reading Research Quarterly*, *36*, 48-62.
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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

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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.

<div align="center">Social Constructionism's First Wave</div>

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

epsitemology, 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 Alfread 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

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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.

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

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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)

<div style="text-align:center">Social Constructionism's Second Wave</div>

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

<div style="text-align:center">138</div>

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 ostensively 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.

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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 <u>construct</u> 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), Foucaldian (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.)

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

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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).

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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 demonstrable. 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

outed 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.

[I]ndividuals 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

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constructionist in orientation.) 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 the1970s 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.

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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 hithertofore 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.

CHAPTER 8

THE DESCENT OF INTERNET PUBLICATIONS: A REVIEW OF LITERACY JOURNALS ONLINE[4]

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 on line ("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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[4] Hruby, G. G. (2001b). *Reading Research and Instruction, 40*, 243-252.
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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 early1700s (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 sit-

com, 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 *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:

> "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.'"

WOO-E, indeed!

This is quite a contrast to the more sober *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. *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 *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.

Other specialized literacy e-journal sites cover such topics as teaching English as a second language (*The Internet TESL Journal*, http://www.aitech.ac.jp/~iteslj/), foreign language education and technology (*Language Learning and Technology*, http://llt.msu.edu/), adult literacy (*Literacy Online*, http://www.literacyonline.org/), media study (*Journal of Computer-Mediated Communication*, http://www.ascusc.org/jcmc/), electronic publishing (*The Journal of Electronic Publishing*, http://www.press.umich.edu/jep/JEPsubject.html; *The Book and the Computer*, http://www.honco.net/), and more.

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

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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/).

<div align="center">Problems with the Evolutionary Analogy</div>

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

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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."

CHAPTER 9

THE SOCIAL CONSTRUCTION OF LITERACY DEVELOPMENT AND CLASSROOM ECOLOGIES[5]

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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[5] Hruby, G. G. (2001c). *Yearbook of the American Reading Forum, 2000*. Whitewater, WI: American
Reading Forum..
    Reprinted here with permission of publisher.

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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

attempts 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

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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 vary nature, be self-animating, largely due both to a legacy of essentialist, dualistic religious dogma, and to the early

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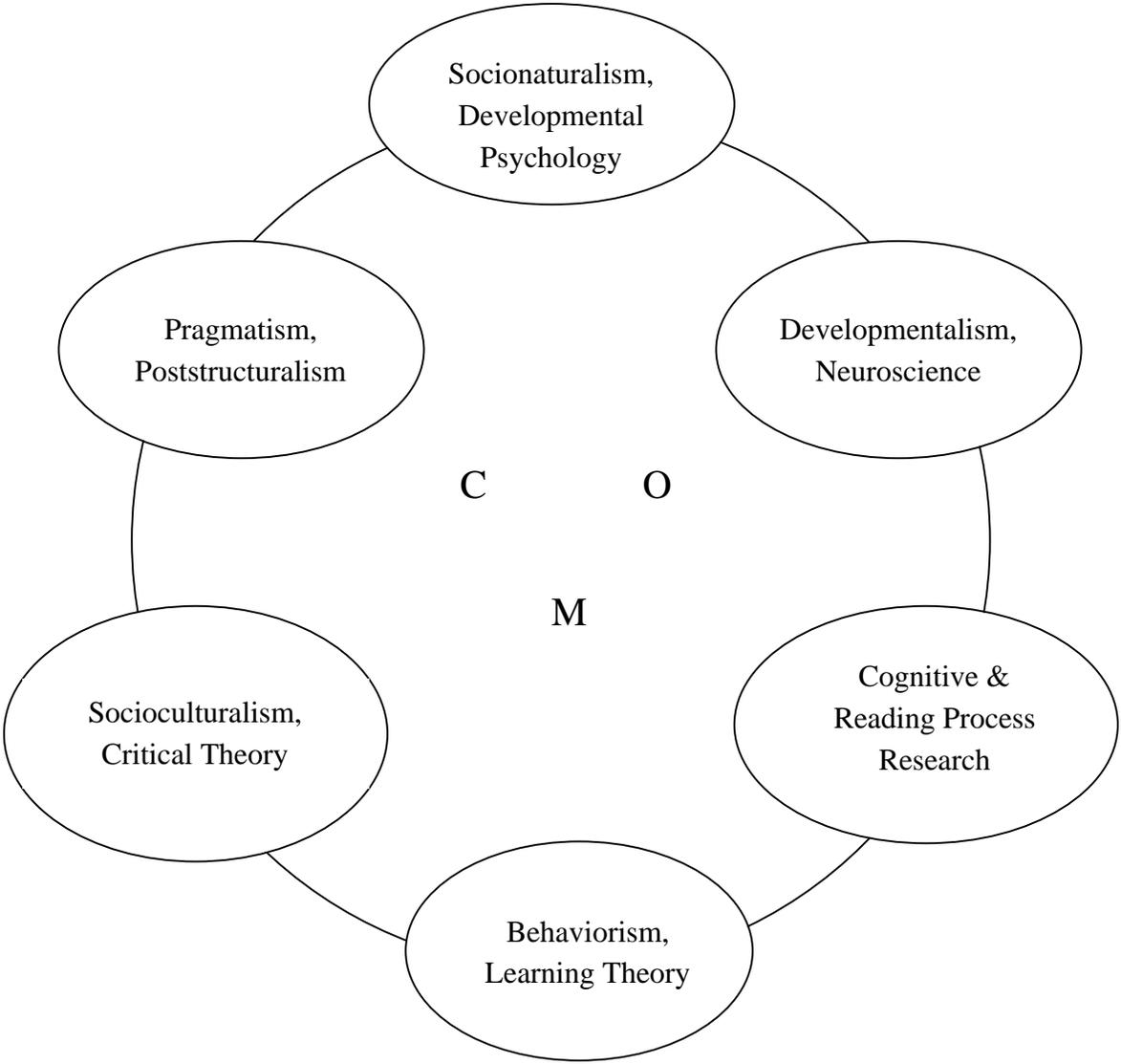
Given these needs, and what I perceive to be the promise of organicist motifs in addressing them, I believe that bio-ecological narratives are deserving of a second chance. Only, this time around, we need to avoid half-hearted attempts and construct them for real, but not as reality.

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)

Socionaturalism,
Developmental
Psychology

Pragmatism,
Poststructuralism

Developmentalism,
Neuroscience

C   O

M

Socioculturalism,
Critical Theory

Cognitive &
Reading Process
Research

Behaviorism,
Learning Theory

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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

constantly 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,

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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,

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2000; Van Geert, 2001). 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 H_2O.

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

socionaturalist to avoid the inherent dualism and essentialism lurking in cognitive

accounts.) From the socionaturalist 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

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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

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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

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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

References

Abram, D. (1996). *The spell of the sensuous: Perception and language in a more-than
-human world*. New York: Vintage Books.

Afflerbach, P. (1998). Helping students become constructively responsive readers. In P.
Reitsma & L. Verhoeven (Eds.), *Problems and interventions in literacy
development* (349-362). Boston: Kluwer Academic Publishers.

Alcoff, L. M. (1996). *Real knowing: New versions of the coherence theory*. Ithaca, NY:
Cornell University Press.

Alexander, P. A. (1998). Knowledge and literacy: A transgenerational perspective. In T.
Shanahan & F. V. Rodriguez-Brown (Eds.), *The 47th Yearbook of the National
Reading Conference* (pp. 22-43). Chicago: National Reading Conference.

Alexander, P. A., & Jetton, T. L. (2000). Learning from text: A multidimensional and
developmental perspective. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R.
Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 285-310). Mahwah, NJ:
Lawrence Erlbaum Associates.

Allen, C., & Bekoff, M. (1997). *Species of mind: The philosophy and biology of
cognitive ethology*. Cambridge, MA: Bradford Books.

Allington, R. L. (1998, December). *Broad claims from slender findings: Early literacy and educational policy recommendations*. Paper presented at the National Reading Conference, Austin, Texas.

Almeder, R. (1998). *Harmless naturalism: The limits of science and the nature of philosophy*. Chicago: Open Court.

Alvermann, D., Boyd, F., Brozo, W., Hinchman, K., Moore, & D., Sturtevant, E. (2002). *Principled practices for a literate America: A framework for literacy and learning in the upper grades*. Unpublished manuscript.

Alvermann, D. E., Commeyras, M., Young, J. P., Randall, S., & Hinson, D. (1997). Interrupting gendered discursive practices in classroom talk about texts: Easy to think about, difficult to do. *Journal of Literacy Research*, *29*, 73-104.

Alvermann, D. E., Hinchman, K. A., Moore, D. W., Phelps, S. F., & Waff, D. R. (Eds.). (1998). *Reconceptualizing the literacies in adolescents' lives*. Mahwah, NJ: Erlbaum & Associates.

Anders, P. L. (2001, April). *Inquiring about developmental changes in reading instruction: The status of theory, research, and practice*. Presentation at Reading Research 2001, New Orleans, LA.

Anderson, J. R. (1995). *Cognitive psychology and its implications* (4th ed.). New York: W. H. Freeman.

Anderson, J. R., Reder, L. M., and Simon, H. A. (1996). Situated learning and education. *Educational Researcher, 25* (4), 5-11.

Anderson, J. R., Reder, L. M., and Simon, H. A. (1997). Situative versus cognitive perspectives: Form versus substance. *Educational Researcher, 26* (1), 18-21.

Audi, R. (Ed.). (1995). *The Cambridge dictionary of philosophy*. Cambridge, UK: Cambridge University Press.

Barkow, J. H., Cosmides, l., & Tooby, J. (Eds.). (1992). *The adapted mind: Evolutionary psychology and the generation of culture*. Oxford: Oxford University Press.

Bates, D. G., & Lees, S. H. (1996). *Case studies in human ecology*. New York: Plenum.

Bateson, G. (1972). *Steps to an ecology of mind.* Chicago: University of Chicago Press.

Bean, T. W., & Valerio, P. C. (1997). Constructing school success in literacy: The pathway to college entrance for minority students. *Reading Research Quarterly, 32*, 320-327.

Bear, M. F., Connors, B. W., & Paradiso, M. A. (1996). *Neuroscience: Exploring the brain*. Baltimore: Williams & Wilkins.

Berger, P. L., & Luckmann, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. Garden City, NY: Doubleday.

Bereiter, D. (1990). Aspects of an educational learning theory. *Review of Educational Research, 60*, 603-624.

Bickerton, D., & commentators. (1984). The language bioprogram hypothesis. *Behavioral and Brain Sciences, 7*, 173-221.

Bidell, T. R., & Fischer, K. W. (1998). Between nature and nurture: The role of human agency in the epigenesis of intelligence. In R. J. Sternberg & E. Grigorenko (Eds.), *Intelligence, heredity, and environment* (pp. 193-242). Cambridge, UK: Cambridge University Press.

Bjorklund, D. F. (2000). *Children's thinking: Developmental function and individual differences* (3rd ed.). Belmont, CA: Wadworth/Thomson Learning.

Blake, J. (2000). *Routes to child language: Evolutionary and developmental precursors*. Cambridge, UK: Cambridge University Press.

Blanton, W. E., Moorman, G. B., Hayes, B. A., & Warner, M. L. (1997). Effects of participation in the Fifth Dimension on far transfer. *Journal of Educational Computing Research,16*, 371-396.

Block, N., Flanagan, O., & Güzeldere, G. (Eds.). (1998). *The nature of consciousness: Philosophical debates*. Cambridge, MA: MIT Press.

Bollinger, D., & Sears, D. A. (1981). *Aspects of language* (3rd ed.). New York: Harcourt Brace Jovanovich.

Bolter, J. D. (1991). *Writing space: The computer, hypertext, and the history of writing*. Hillsdale, NJ: Erlbaum.

Booth, W. C. (1983). *The rhetoric of fiction*. Chicago: University of Chicago Press.

Bornstein, M. H. & Lamb, M. E. (Eds.). (1999). *Developmental psychology: An advanced textbook* (4th ed.). Mahwah, NJ: Erlbaum.

Bosma, H. A., & Kunnen, E. S. (Eds.). (2001). *Identity and emotion: Development through self-organization*. Paris: Cambridge University Press.

Brockman, J. (1995). *The third culture*. New York: Simon and Schuster.

Bronfenbrenner, U. (Ed.). (1972). *Influences on human development*. Hinsdale, IL: Dryden Press.

Brofenbrenner, U. (1993). The ecology of cognitive development: Research models and fugitive findings. In R. H. Wozniak, & K. W. Fischer (Eds.), *Development in context: Acting and thinking in specific environments*. Hillsdale, NJ: Lawrence Erlbaum and Associates.

Bronfenbrenner, U., & Ceci, S. J. (1994). Nature-nurture reconceptualized in developmental perspective: A bioecological model. *Psychological Review 101*, 568-586.

Brooks, R. A. (1999). *Cambrian intelligence: The early history of the new AI*. Cambridge, MA: MIT Press.

Bruer, J. T. (1997). Education and the brain: A bridge too far. *Educational Researcher, 26* (8), 4–16.

Bruer, J. T. (1999). *The myth of the first three years: A new understanding of early brain development and lifelong learning*. New York: Free Press.

Bruner, J. S. (1986). *Actual minds, possible worlds*. Cambridge, MA: Harvard University Press.

Bruner, J. S. (1990). *Acts of meaning*. Cambridge, Massachusetts: Harvard University Press.

Buckholtz, A. (1999). Electronic genesis: E-journals in the sciences. *Academe-Bulletin of the American Association of University Professors, 85* (5), 65-68.

Budwig, N. (1995). *A developmental-functionalist approach to child language*. Mahwah, NJ: Erlbaum.

Burke, K. (1945/1969). *A grammar of motives*. Berkley, CA: University of California Press.

Burningham, K., & Cooper, G. (1999). Being constructive: Social constructionism and the environment. *Sociology, 33*, 297-316.

Burr, V. (1995). *An introduction to social constructionism*. London: Routledge.

Burr, V. (1998). Overview: Realism, relativism, social constructionism and discourse. In I. Parker (Ed.), *Social constructionism, discourse and realism* (pp. 13-26). London: Sage.

Buss, A. R. (1979). On the four kinds of causality. *The Behavioral and Brain Sciences, 2*, 139.

Butler, J. (1992). Contingent foundations: Feminism and the question of

    "postmodernism." In J. Butler & J. W. Scott (Eds.)., *Feminists theorize the*

    political (pp. 3-21). New York: Routledge.

Cairns-Smith, A. G. (1996). *Evolving the mind: On the nature of matter and the origin of*

    consciousness. Cambridge: Cambridge University Press.

Campbell, J. (1969a) *The masks of God* (Vol. 2)*. Oriental mythology*. New York:

    Viking.

Campbell, J. (1969b) *The masks of God* (Vol. 3)*. Occidental mythology*. New York:

    Viking.

Campbell, J. (1986). *The inner reaches of outer space: Metaphor as myth and religion*.

    New York: A. van der Marck Editions.

Carrithers, M. (1992). *Why humans have cultures: Explaining anthropology and social*

    diversity. Oxford: Oxford University Press.

Carroll, J. B. (Ed.). (1956). *Language, thought and reality: Selected writings of*

    Benjamin Lee Whorf. Cambridge, MA: MIT Press.

Cassirer, E. (1951). *The philosophy of the enlightenment*. (Trans, Fritz C. A. Koelln &

    James P. Pettegrove). Princeton, NJ: Princeton University Press.

Cavalli-Sforza, L. L. (2000). *Genes, peoples, and languages*. (Trans. by M. Seielstad).

    Berkely, CA: University of California Press.

Ceci, S. (1990). *On intelligence—more or less: A bio-ecological treatise on intellectual development*. Englewood Cliffs, NJ: Prentice-Hall.

Ceci, S. J., Rosenblum, T., de Bruyn, E., & Lee, D. Y. (1997). A bio-ecological model of intellectual development: Moving beyond *h2*. In R. J. Sternberg, & E. Grigorenko (Eds.), *Intelligence, heredity, and the environment* (pp. 303-322). Cambridge, UK: Cambridge University Press.

Chall, J. S. (1996). *Stages of reading development* (2nd ed.). Fort Worth, TX: Harcourt Brace College Publishers.

Chinn, C. A. (1998). A critique of social constructivist explanations of knowledge change. In B. Guzzetti and C. Hynd (Eds.), *Perspectives on conceptual change: Multiple ways of understanding knowing and learning in a complex world* (pp. 77–115). Mahwah, NJ: Erlbaum.

Chu, H. T. (2000). Promises and challenges of electronic journals: Academic libraries surveyed. *Learned Publishing,13*,169-175.

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

Cilliers, P. (1998). *Complexity and postmodernism: Understanding complex systems*. New York: Routledge.

Clancey, W. J. (1997). *Situated cognition: On human knowledge and computer representations*. Cambridge, UK: Cambridge University Press.

Clark, A. (1997). *Being there: Putting brain, body, and world together again.* Cambridge, MA: MIT Press.

Clarke, J. J. (1992). *In search of Jung: Historical and philosophical enquiries.* London: Routledge.

Clay, M. (1991). *Becoming literate: The construction of inner control.* Portsmouth, NH: Heinemann.

Coles, G. (2000). *Misreading reading: The bad science that hurts children.* Portsmouth, NH: Heineman.

Cobb, P., and Bowers, J. (1999). Cognitive and situated learning perspectives in theory and practice. *Educational Researcher, 28* (2), 4–15.

Cole, M., Engeström, Y., and Vasquez, O. (Eds.). (1997). *Mind, culture, and activity: Seminal papers from the laboratory of comparative human cognition.* Cambridge: Cambridge Unviersity Press.

Coleman, W., & Sharrock, W. (1998). Unconstructive. In I. Velody & R. Williams (Eds.), *The politics of social constructionism* (pp. 100-108). London: Sage.

Collier, A. (1998). Language, practice and realism. In I. Parker (Ed.), *Social constructionism, discourse and realism* (pp. 47-58). London: Sage.

Commeyras, M. (1999). How interested are literacy educators in gender issues? Survey results from the United States. *Journal of Adolescent and Adult Literacy, 42*, 352-362.

Conant, J., B. (1951). *On understanding science*. New York: New American Library.

Coulmas, F. (Ed.). (1997). *The handbook of sociolinguistics*. Oxford: Blackwell.

Cronk, L., Chagnon, N., & Irons, W. (Eds.). (2000). *Adaptation and human behavior: An anthropological perspective*. New York: Aldine De Gruyter.

Cunningham, J. W., & Fitzgerald, J. (1996). Epistemology and reading. *Reading Research Quarterly, 31*, 36-60.

Curtis, J. E., & Petras, J. W. (Eds.). (1970). *The sociology of knowledge*. London: Gerald Duckworth.

Damon, W. (Ed.). (1998). Handbook of child psychology (5th ed.). New York: Wiley.

Darwin, C. (1871). *Descent of man*. London: John Murray.

Davies, B. (1994). *Poststructuralist theory and classroom practice*. Geelong, Australia: Deakin University Press.

Davis, B, Sumara, D., & Luce-Kapler, R. (2000). *Engaging minds: Learning and teaching in a complex world*. Mahwah, NJ: Lawrence Erlbaum and Associates.

Dawkins, R. (1996). *The blind watchmaker: Why the evidence of evolution reveals a universe without design*. New York: Norton.

DeLamater, J. D., & Hyde, J. S. (1998). Essentialism vs. social constructionism in the study of human sexuality. *Journal of Sex Research, 35*, 10-18.

Dennett, D. C. (1995). *Darwin's dangerous idea : Evolution and the meanings of life*. New York: Simon & Schuster.

Depew, D. J., & Weber, B. H. (1995). *Darwinism evolving: Systems dynamics and the genealogy of natural selection*. Cambridge, MA: MIT Press.

Derrida, J. (1976). *Of grammatology* (Gayatri Spivak, Trans.). Baltimore: John Hopkins University Press.

Dewey, J., & Bentley, A. F. (1949). *Knowing and the known*. Boston, MA: Beacon Press.

Dillon, D. R., O'Brien, D. G., & Heilman, E. E. (2000). Literacy research in the next millennium: From paradigms to pragmatism and practicality. *Reading Research Quarterly, 35*, 10-26.

Dilthey, W. (1996). *Hermeneutics and the study of history*. Princeton, NJ: Princeton University Press.

Donmoyer, R. (1996). Educational research in an era of paradigm proliferation: What's a journal editor to do? *Educational Researcher, 25* (2), 19-25.

Donmoyer, R. (2001). Paradigm talk reconsidered. In V. Richardson (Ed.), *Handbook on research on teaching* (4th ed.). Washington, DC: American Educational Research Association.

Drabble, M. (Ed.). (2000). *The Oxford companion to English literature*(6th ed.). Oxford: Oxford University Press.

Drai, D. (1999). *Supervenience and realism*. Aldershot, UK: Ashgate.

Dretske, F. (1995). *Naturalizing the mind*. Cambridge, MA: MIT Press.

Dunbar, R., Knight, C., & Power, C. (Eds.). (1999). *The evolution of culture*. New

    Brunswick, NJ: Rutgers University Press.

Durkheim, E. (1983). *Pragmatism and sociology*. Cambridge, UK: Cambridge University

    Press.

Edelman, G. M. (1992). *Bright air, brilliant fire: On the matter of the mind*. New York:

    Basic Books.

Efron, A. (1980). Root metaphor: The live thought of Stephen C. Pepper. Paunch, 53-54.

    Retrieved June 10, 2001, from http://www.sunyit.edu/~harrell/Pepper/Index.htm

Ehri, L. C. (1994). Development of the ability to read words: Update. In R. B. Ruddell,

    M. R. Ruddell, H. Singer (Eds.), *Theoretical models and processes of reading* (4th

    ed., pp. 323-358). Newark, DE: International Reading Association.

Ellis, J. M. (1989). *Against deconstruction*. Princeton, NJ: Princeton University Press.

Elman, J. L., Bates, E. A., Johnson, M. H., Karmiloff-Smith, A., Parisi, D., & Plunkett,

    K. (1996). *Rethinking innateness: A connectionist perspective on development*.

    Cambridge, MA: MIT Press.

Erikson, E. H. (1968). *Identity, youth, and crisis*. New York: Norton.

Farrell, F. B. (1996). *Subjectivity, realism and postmodernism: The recovery of the world

    in recent philosophy*. Cambridge, UK: Cambridge University Press.

Feffer, M. (1988). *Radical constructionism: Rethinking the dynamics of development*.

    New York: New York University Press.

Fisher, D., Flood, J., & Lapp, D. (1999). The role of literature in literacy development. In

    L. B. Gambrell, L. M. Morrow, S. B. Neuman, M. Pressley (Eds.), *Best practices*

    in literacy instruction (pp. 119-135). New York: the Guilford Press.

Fishman, S. M., & McCarthy, L. P. (1992). Is expressivism dead? Reconsidering its

    romantic roots and its relation to social constructionism. *College English, 54*, 647-

    661.

Flanagan, O. (1992). *Consciousness reconsidered.* Cambridge, MA: MIT Press.

Fleck, L. (1979/1935). *Genesis and development of scientific fact.* Chicago:

    University of Chicago Press.

Floden, R. E. (2001). Research on effects of teaching: A continuing model for research

    on teaching. In V. Richardson (Ed.), *Handbook of research on teaching* (4th

    ed.). Washington, DC: American Educational Research Association.

Fodor, J. (1975). *The language of thought.* New York: Crowell.

Fodor, J. (2000). *The mind doesn't work that way: The scope and limits of computational*

    psychology. Cambridge, MA: MIT Press.

Font, G., & Hruby, G. G. (2000). Constructing the –isms of making meaning. *Literacy at*

    a new horizon: The twenty-second yearbook; a peer-reviewed publication of the

    College Reading Association Yearbook, 2000, 118-130.

Forman, E. A. & Cazden, C. B. (1994). Exploring Vygotskian perspectives in education:

    The cognitive value of peer interaction. In R. B. Ruddell, M. R. Ruddell, H.

Singer (Eds.), *Theoretical models and processes of reading* (4ᵗʰ ed., pp. 155-

178). Newark, DE: International Reading Association.

Foucault, M. (1972). *The archeology of knowledge* (A. M. S. Smith, Trans.). New York:

Pantheon.

Foucault, M. (1978). *The history of sexuality: An introduction*. New York: Vintage

Books.

Frank, S. A. (1998). *Foundations of social evolution*. Princeton, NJ: Princeton University

Press.

Freeman, W. J. (2000). Emotion is essential to all intentional behaviors. In M. D. Lewis,

and I. Granic, (Eds.). (2000). *Emotion, development, and self-organization:*

Dynamic systems approaches to emotional development. Cambridge, UK:

Cambridge University Press.

Freud, S. (1964). An outline of psychoanalysis. In J. Stratchey (Ed. and Trans.), *The*

standard edition of the complete psychological works of Sigmund Freud (Vol 23),

London: Hogarth Press.

Froese, V. (Ed.). (1996). *Whole language: Practice and theory* (2nd ed.). Boston: Allyn

and Bacon.

Fuller, S. (1998). The reflexive politics of constructivism revisited. In I. Velody & R.

Williams (Eds.), *The politics of social constructionism* (pp. 83-99). London: Sage.

Gaffney, J. S., & Anderson, R. C. (2000). Trends in reading research in the United States:

Changing intellectual currents over three decades. In M. L. Kamil, P. B.

Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research*

(Vol. 3, pp. 53-74). Mahwah, NJ: Lawrence Erlbaum Associates.

Gambrell, L. (2000). Reflections on literacy research: The decades of the 1970s, 1980s,

and 1990s. In T. Shanahan & F. V. Rodriguez-Brown (Eds.), *The 49th Yearbook

of the National Reading Conference* (pp. 1-11). Chicago: National Reading

Conference.

Garcia, G. E. & Pearson, P. D. (1991). Modifying reading instruction to maximize its

effectiveness for all students. In M. S. Knapp & P. M. Shields (Eds.), *Better

schooling for the children of poverty* (pp. 31-60). Berkely, CA: McCutcheon.

Gardiner, H. W., Mutter, J. D., Kosmitski, C. (1998). *Lives across cultures: Cross-

cultural human development*. Needham Heights, MA: Allyn and Bacon.

Gee, J. P. (1990). *Social linguistics and literacies: Ideology in dscourses*. New York:

Falmer Press.

Gergen, K. J. (1985). The social constructionist movement in modern psychology.

American Psychologist, 40(3), 266-275.

Gergen, K. J. (1987). Introduction: The language of psychological understanding. In H. J.

Stam, T. B. Rogers, & K. J. Gergen (Eds.), *The analysis of psychological theory:

Metapsychological perspectives* (pp. 1-21). Washington, DC: Hemisphere.

Gergen, K. J. (1989). Warranting voice and the elaboration of the self. In J. Shotter & K. J. Gergen (Eds.), *Texts of identity* (pp. 70-81) . London: Sage.

Gergen, K. J. (1995). Metaphor and monophony in the 20th-centry psychology of emotions. *History of the Human Sciences, 8*(2), 1-23.

Gergen, K. J. (1998a). Constructionist dialogues and the vicissitudes of the political. In I. Velody & R. Williams (Eds.), *The politics of social constructionism* (pp. 33-48). London: Sage.

Gergen, K. J. (1998b). Constructionism and realism: How are we to go on? In I. Parker (Ed.),*Social constructionism, discourse and realism* (pp. 147-155). London: Sage.

Gergen, K. J., & Davis, K. E. (Eds.). (1985). *The social construction of the person*. New York: Springer-Verlag.

Gibson, E. J. (1991). *An odyssey in learning and perception*. Cambridge, MA: MIT Press.

Gibson, J. J. (1966). *The senses considered as perceptual systems*. Boston: Houghton Mifflin.

Gibson, J. J. (1986). *The ecological approach to visual perception*. Hillsdale, New Jersey: Lawrence Erlbaum and Associates. [Originally published in 1979.]

Gibson, J. J., and Crooks, L. E. (1938). A theoretical field analysis of automobile-driving. *American Journal of Psychology, 51*, 453-71.

Glassman, M. (2001). Dewey & Vygotsky: Society, experience, and inquiry in educational practice. *Educational Researcher, 30* (4), 3-14.

Goodman, K. (1994). Reading, writing, and written texts: A transactional

sociopsycholinguistic view. In R. B. Ruddell, M. R. Ruddell, H. Singer (Eds.),

Theoretical models and processes of reading (4th ed. pp. 1093-1130).

Newark, DE: International Reading Association.

Goodman, N. (1978). *Ways of worldmaking*. Indianapolis, IN: Hackett.

Gould, S. J. (1996). *The mismeasure of man*. NY: Norton.

Greenfield, S. A. (1997). *The human brain: A guided tour*. New York: Basic Books.

Greeno, J. G. (1997). On claims that answer the wrong questions. *Educational

Researcher, 26* (1), 5–17.

Greenwood, J. D. (1994). *Realism, identity and emotion: Reclaiming social psychology*.

London: Sage.

Grigorenko, E. L., & Kornilova, T. V. (1997). The resolution of the nature-nurture

controversy by Russian psychology: Culturally biased or culturally specific? In

R. J. Sternberg, & E. Grigorenko (Eds.), *Intelligence, heredity, and the

environment*, (pp. 393-439). Cambridge, UK: Cambridge University Press.

Gronbeck, B. E. (1981). Qualitative communication theory and rhetorical studies in the

1980s. *Central States Speech Journal, 32*, 243-253.

Gubrium, J. F. (1993). For a cautious naturalism. In J. A. Holstein & G. Miller (Eds.),

Reconsidering social construction: Debates in social problems theory. New York:

Aldine De Gruyter.

Gunderson, L. (1996). Reading and language development. In V. Froese (Ed.), *Whole-language: Practice and theory* (2nd ed.). Boston: Allyn and Bacon.

Guthrie, J. T. (2000, September). *Subject matter literacy*. Presentation at the Southeast Literacy Consortium Conference, Athens, GA.

Guthrie, J. T. & Wigfield, A. (2000). Engagement and motivation in reading. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 403-422). Mahwah, NJ: Erlbaum.

Habermas, J. (1987). *The philosophical discourse of modernity: Twelve lectures*. Cambridge, MA: MIT Press.

Haeckel, E. (1879). *The evolution of man: A popular exposition of the principle points of human ontogeny and phylogeny*. New York: Dutton.

Harland, R. (1987). *Superstructuralism: The philosophy of structuralism and post-structuralism*. New York: Methuen.

Harold, F. M. (2001). *The way of the cell: Molecules, organisms, and the order of life*. Oxford: Oxford University Press.

Harré, R., & Gillett, G. (1994). *The discursive mind*. Thousand Oaks: Sage.

Harrell, B. J. (2002) Five world hypotheses: A primer on Stephen C. Pepper's epistemological system with illustrations from the arts, humanities, social, and natural sciences. Retrieved November, 20, 2000, from http://www.sunyit.edu/~harrell/Pepper/bjh_pep01.htm

Harris, M., & Johnson, O. (2000). *Cultural anthropology* (5th ed.). Boston: Allyn and

    Bacon.

Harris, T. L. (1969). Reading. In R. L. Ebel (Ed.), *Encyclopedia of Educational Research*

    (4th ed., pp. 1069-1108). Toronto: McMillan and the American Educational

    Research Association.

Harste, J. C., & Leland, C. H. (1998). No quick fix: Education is inquiry. *Reading*

    Research and Instruction, 37, 191-206.

Hauser, M. D. (1996). *The evolution of communication*. Cambridge, MIT Press.

Haviland, W. A. (2000). *Anthropology* (9th ed.). New York: Harcourt College

    Publishers.

Hayes, D. A. (1997). Models of professional practice in teacher thinking. In S. A. Stahl,

    D. A. Hayes (Eds.), *Instructional models in reading* (pp. 31-58). Mahwah, NJ:

    Erlbaum.

Heath, S. B. (1991). The sense of being literate: Historical and cross-cultural features. In

    R. Barr, M. L. Kamil, P. Mosenthal & P. D. Pearson (Eds.), *Handbook of reading*

    research (Vol. 2, pp. 3-25). Mahwah, NJ: Erlbaum.

Hendriks-Jansen, H. (1996). *Catching ourselves in the act: Situated activity, interactive*

    emergence, evolution, and human thought. Cambridge, MA: MIT Press.

Hermans, H. J. M. & Kempen, H. J. G. (1993). *The dialogical self: Meaning as*

    movement. San Diego, CA: Academic Press.

Hiebert E. H. & Raphael, T. E. (1996). Psychological perspectives on literacy and

    extensions to educational practice. In D. C. Berliner & R. C. Calfee (Eds.),

    Handbook of educational psychology. New York: Simon and Shuster Macmillan.

Hilton, D. J. (Ed.). (1988). *Contemporary science and natural explanation:*

    Commonsense conceptions of causality. New York: New York University Press.

Hirschfeld, L. A. (1996). *Race in the making: Cognition, culture, and the child's*

    construction of human kinds. Cambridge, MA: MIT Press.

Holland, N. N. (1992). *The critical I*. New York: Columbia University Press.Holton, G.

    (1993). *Science and anti-science*. Cambridge, MA: Harvard University Press.

Holmes, J. A. & Singer, H. (1964). Theoretical models and trends toward more basic

    research in reading. *Review of Educational Research, 34*, 127-155.

Horkheimer, M., & Adorno, T. W. (1944/1997). *The dialectic of enlightenment*. New

    York: Continuum.

Hoyningen-Huene, P. (1993). *Reconstructing scientific revolutions: Thomas S. Kuhn's*

    philosophy of science. Trans. A. T. Levine. Chicago: University of Chicago Press.

Hruby, G. G. (1999a, April). Discussant's comments. In C. F. Bohlin (Chair), *Brain*

    research and its implications for educational theory and practice. Symposium

    conducted at the annual meeting of the American Educational Research

    Association, Montréal, Canada.

Hruby, G. G. (1999b). Cognition and the mind [review of the book "Teaching with the brain in mind."] *Roeper Review, 21*, 326-327.

Hruby, G. G. (2000a). The biofunctional theory of knowledge and ecologically informed education research. *The Journal of Mind and Behavior, 21* (1 & 2), 97-103.

Hruby, G. G. (2000b, December). *The construction of classroom realities: The ecological dynamics of learning environments*. Keynote address delivered at the meeting of the American Reading Forum, Sanibel Island, FL.

Hruby, G. G. (2001a). Sociological, postmodern, and "new realism" perspectives in social constructionism: Implications for reading research. *Reading Research Quarterly, 36*, 48-62.

Hruby, G. G. (2001b). The descent of Internet publications: A review of literacy journals online. *Reading Research and Instruction, 40*, 243-252.

Hruby, G. G. (2001c). Constructing the ecological dynamics of learning environments. Invited Keynote Paper, *Yearbook of the American Reading Forum, 2000*. Whitewater, WI: American Reading Forum.

Iran-Nejad, A. (2000). Knowledge, self-regulation, and the brain-mind cycle of reflection. *The Journal of Mind and Behavior, 21*, 67-88.

James, W. (1890). *Principles of psychology* (2 vols.). New York: Holt.

Jensen, E. (1998). *Teaching with the brain in mind*. Alexandria, VA: Association for Supervision and Curriculum Development.

Johnson, M. (1987). *The body in the mind: The bodily basis of meaning, imagination, and reason*. Chicago : University of Chicago Press, 1987.

Johnston, T. D., and Pietrewicz, A. T. (Eds.). (1985). *Issues in the ecological study of learning*. Hillsdale, New Jersey: Lawrence Erlbaum and Associates.

Kamil, M. L. (1984). Current traditions of reading research. In P. D. Pearson (Ed.), *Handbook of reading research* (pp. 39-62). New York: Longman.

Kamil, M. L.(1995). Some alternatives to paradigm wars in literacy research. *Journal of Reading Behavior, 27*, 243-261.

Kamil, M. L., Intrator, S. M., Kim, H. S. (2000). The effects of other technologies on literacy and literacy learning. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 771-789). Mahwah, NJ: Erlbaum.

Kamil, M. L., Mosenthal, P. B., Pearson, P. D., & Barr, R. (Eds.). (2000). *Handbook of reading research* (Vol. 3). Mahwah, NJ: Erlbaum.

Kauffman, S. (1995). *At home in the universe: The search for laws of self-organization and complexity*. Oxford: Oxford University Press.

Kehoe, A. B. (1998). *Humans: An introduction to four-field anthropology*. NY: Routledge.

Keppel, T. (1995). The personal and the social self: Reconciling expressionism and social constructionism. *Writing Instructor, 14*, 121-134.

Kiel, L. D., & Elliott, E. (1996). *Chaos theory in the social sciences: foundations and applications*. Ann Arbor, MI: University of Michigan Press.

Kintsch, W. (1998). *Comprehension: A paradigm for cognition*. Cambridge, UK: Cambridge University Press.

Kirshner, D., & Whitson, J. A. (1997). *Situated cognition: Social, semiotic, and psychological perspectives*. Mahwah, NJ: Erlbaum.

Kling, M. (1971a) Background and development of the literature search: Targeted research

and development program in reading. In F. B. Davis (Ed.), *The literature of research in reading with emphasis on models* (pp. 1-1 – 1-23). New Brunswick, NJ: Rutgers.

Kling, M. (1971b) Quest for synthesis. In F. B. Davis (Ed.), *The literature of research in reading with emphasis on models* (pp. 2-1 – 2-18). New Brunswick, NJ: Rutgers.

Konner, M. (1982). *The tangled wing: Biological constraints on the human spirit*. New York: Henry Holt.

Kosslyn, S. M., & Koenig, O. (1992). *Wet mind: The new cognitive neuroscience*. New York: Free Press.

Kuhn, T. S. (1962). *The structure of scientific revolutions*. Chicago: University of Chicago Press.

Kuhn, T. S. (1969). *The structure of scientific revolutions* (3rd ed.). Chicago: University

    of Chicago Press.

Labbo, L. D., & Reinking, D. (1999). Theory and research into practice: Negotiating the

    multiple realities of technology in literacy research and instruction. *Reading*

    Research Quarterly, 34, 478-492.

Lakatos, I. (1978). *The methodology of scientific research programmes: Philosophical*

    Papers (Vol. 1), New York: Cambridge University Press.

Lakoff, G. (1987). *Women, fire, and dangerous things: What categories reveal about the*

    mind. Chicago: University of Chicago Press.

Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its*

    challenge to Western thought. New York: Basic Books.

Laudan, L. (1977). *Progress and its problems: towards a theory of scientific growth*.

    Berkley, CA: University of California Press.

Lave, J. (1990). The culture of acquisition and the practice of understanding. In J. W.

    Stigler, R. A. Shweder, and G. Herdt (Eds.), *Cultural psychology: Essays on*

    comparative human development. Cambridge: Cambridge University Press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*.

    Cambridge, UK: Cambridge University Press.

Lerner, R. M. (1976). *Concepts and theories of human development.* Reading, MA:

    Addison-Wesley.

Lerner, R. M. (1986). *Concepts and theories of human development* (2nd ed.). New York: Random House.

Lerner, R. M. (2002). *Concepts and theories of human development* (3rd ed.). Mahwah, NJ: Erlbaum.

Lerner, R. M. (1998). Theories of human development: Contemporary perspectives. In W. Damon (Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (5th ed., pp. 1-24). Mew York: Wiley.

Leu, D. J., Jr. (2000). Literacy and technology: Deictic consequences for literacy education in an information age. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 743-770). Mahwah, NJ: Erlbaum

Leu, D. J., Mallett, M. H., Karchmer, R. A. (2000, November). *Literacy and Technology: A preview of a special themed issue of* Reading Research & Instruction. Paper presented at the annual meeting of the College Reading Association, St. Pete Beach, Florida.

Lewis, M. D., & Granic, I. (Eds.). (2000). *Emotion, development, and self-organization: Dynamic systems approaches to emotional development*. Cambridge, UK: Cambridge University Press.

Lincoln, Y. S. & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: SAGE Publications.

Lincoln, Y. S. & Guba, E. G. (2000). Paradigmatic controversies, contradictions, and

emerging influences. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of*

qualitative research (2nd ed.). Thousand Oaks, CA: SAGE.

Lipschultz, J. H., & Hilt, M. L. (1999). Mass media and the death penalty: Social

construction of three Nebraska executions. *Journal of Broadcasting and*

Electronic Media, 43, 236-253.

Lloyd, C. V. (1998). Adolescent girls: Constructing and doing literacy, constructing and

doing gender. *Reading Research Quarterly, 33*, 129-136.

Looft, W. R. (1973). Socialization and personality throughout the life span: An

examination of contemporary psychological approaches. In P. B. Baltes & K. W.

Schaie (Eds.), *Life-span developmental psychology: Personality and socialization*

(pp. 25-52). New York: Academic Press.

Loomis, W. F., & Insall, R. H. (1999). A cell for all reasons. *Nature, 401*, 440-441.

Lorenz, K. (1965). *Evolution and modification of behavior*. Chicago: University of

Chicago Press.

Lougee, W. P. (2000). Scholarly journals in the late 20th century. *Library Collections*

Acquisitions and Technical Services, 24, 239-250.

Lovelock, J. E. (1987). *Gaia: A new look at life on earth*. Oxford: Oxford University

Press.

Lyell, C. (1850). *Principle of geology: Or, the modern changes of the earth and its inhabitants conceived as illustrative of geology* (8th ed.). London: J. Murray.

Lynch, M. (1998). Towards a constructivist genealogy of social constructivism. In I. Velody & R. Williams (Eds.), *The politics of social constructionism* (pp. 13-32). London: Sage.

Lynn, S. J., Pintar, J., Stafford, J., Marmelstein, L. & Lock, T. (1998). Rendering the implausible plausible: Narrative construction, suggestion, and memory. In In J. de Rivera & T. R. Sarbin (Eds.), *Believed-in imaginings: The narrative construction of reality* (pp. 123-143). Washington, DC: American Psychological Association.

Mahiri, J., & Godley, A. J. (1998). Rewriting identity: Social meanings of literacy and "revisions" of self. *Reading Research Quarterly, 33*, 416-433.

Mannheim, K. (1991). *Ideology and utopia: An introduction to the sociology of knowledge*. London: Routledge.

Marion, R. (1999). *The edge of organization: chaos and complexity theories of formal social systems*. Thousand Oaks, CA: SAGE Publications.

Marr, D. (1982). *Vision*. New York: W. H. Freeman.

Marx, K. (1967). *Capital: A critique of political economy*. New York: International Publishers.

Masterman, M. (1970). The nature of a paradigm. In I, Lakatos & A. Musgrave (Eds.),

    Criticism and the growth of knowledge. (pp. 59-89). Cambridge, UK: Cambridge

    University Press.

McCarthey, S. J. (1998). Constructing multiple subjectivities in classroom literacy

    contexts. *Research in the Teaching of English, 32*, 126-160.

McCarty, L. P. & Schwandt, T. A. (2000). Seductive illusions: Von Glasersfeld and

    Gergen on epistemology and education. In D. C. Phillips (Ed.), *Constructivism in*

    education: Opinions and second opinions on controversial issues (pp. 41–85).

    Chicago: University of Chicago Press.

McKenna, M. C., Stahl, S. A. & Reinking, D. (1994). A critical commentary on research,

    politics, and whole language. *Journal of Reading Behavior, 26*, 211-233.

Mead, G. H. (1982). *The individual and the social self: Unpublished work of George*

    Herbert Mead. Chicago: University of Chicago Press.

McGee, R. J., & Warms, R. L. (Eds.). (2000). *Anthropological theory: An introductory*

    history. Mountainview, CA: Mayfield Publishing.

Merton, R. (1996). *On social structure and science*. Chicago: University of Chicago

    Press.

Michel, G. F., & Moore, C. L. (1995). *Developmental psychobiology: An*

    interdisciplinary science. Cambridge, MA: MIT Press.

Miller. G. A. (1956). The magic number seven plus or minus two: Some limits on our

    capacity for processing information. *Psychological Review, 63*, 81-97.

Miller, P. H. (1993). *Theories of developmental psychology* (3rd ed.). New York: W.

    H. Freeman and Company.

Millikan, R. (1984). *Language, thought, and other biological categories*. Cambridge,

    MA: MIT Press.

Milroy, L. (1987). *Observing and analysing natural language: A critical account of*

    sociolinguistic method. Oxford, UK: Basil Blackwell.

Minick, N., Stone, C. A., & Forman, E. A. (1993). Integration of individual, social, and

    institutional process in accounts of children's learning and development. In E.

    Forman, N. Minick, & C. A. Stone (Eds.), *Contexts for learning: Sociocultural*

    dynamics in children's development (pp. 3-16). New York: Oxford University

    Press.

Moll, L. C. (2001). Through the mediation of others: Vygotskian research on teaching. In

    V. Richardson (Ed.), *Handbook of research on teaching*. Washington, DC:

    American Educational Research Association.

Monaghan, E. J. & Hartman, D. K. (2000). Undertaking historical research in literacy. In

    M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of*

    reading research (Vol. 3, pp. 109-121). Mahwah, NJ: Lawrence Erlbaum

    Associates.

Moore, D. W. (1996). Contexts for literacy in secondary schools. In D. J. Leu, C. K. Kinzer & K. A. Hinchman (Eds.). *Literacies for the 21st century: Research and practice: Forty-fifth yearbook of the National Reading Conference* (pp. 15-46). Chicago: National Reading Conference.

Moore, T. (1992). *Care of the soul: A guide for cultivating depth and sacredness in everyday life*. New York: HarperCollins.

Moran, E. F. (1990). *The ecosystem approach in anthropology: From concept to practice*. Ann Arbor: University of Michigan Press.

More than 2,000 journals now available electronic collections online. (April, 2000). *Program-Electronic Library and Information Systems*, *34*, pp. 221-222.

Mosenthal, P. B. (1999). Critical issues: Forging conceptual unum in the literacy field of pluribus: An agenda-analytic perspective. *Journal of Literacy Research, 31*, 213-354.

Moser, P. K., & Trout, J. D. (1995). *Contemporary materialism: A reader*. London: Routledge.

Mussen, P. H. (Ed.). (1970). *Carmichael's manual of child psychology* (3rd ed.). New York: Wiley.

Mussen, P. H. & Kessen, W. (Eds.). (1983). *Handbook of Child Psychology: Vol. 1. History, theory, and methods*. New York: Wiley.

Neisser, U. (1993). Without perception, there is no knowledge: Implications for artificial

   intelligence. In R. G. Burton (Ed.), *Natural and artificial minds*. Albany, New

   York: SUNY Press.

Nietzsche, F. W. (1967). *The will to power*. New York: Random House.

Nietzche, F. W. (1996). *On the genealogy of morals: A polemic: By way of clarification

   and supplement to my last book, Beyond good and evil* (Douglas Smith, Trans.).

   Oxford: Oxford University Press.

Odlyzko, A. (1999). Competition and cooperation: Libraries and publishers in the

   transition to electronic scholarly journals. *Journal of Scholarly Publishing,

   30*,163-185.

Olson, G. A. (1989). Social construction and composition theory: A conversation with

   Richard Rorty. *Journal of Advanced Composition, 9*(1-2), 1-9.

Olson, G. A. (1990). Jacques Derrida on rhetoric and composition: A conversation.

   Journal of Advanced Composition, 10(1), 1-21.

Ornstein, P. (1997). *The right mind: Making sense of the hemispheres*. New York:

   Harcourt Brace & Company.

Overton, W. F. (1984). World views and their influences on psychological theory and

   research: Kuhn-Lakatos-Lauden. In H. W. Reese (Ed.), *Advances in child

   development and behavior* (Vol. 18, pp. 191-226). New York: Academic Press.

Overton, W. F. (1998). Developmental psychology: Philosophy, concepts, and

    methodology. In W. Damon (Ed.), *The handbook of child psychology: Vol. 1*

    Theoretical models of human development (5th ed., pp107-189). New York:

    Wiley.

Overton, W. F. & Reese, H. (1973). Models of development: Methodological

    implications. In J. R. Nesselroade & H. W. Reese (Eds.), *Life-span development*

    psychology: Methodological issues (pp. 65-86). New York: Academic Press.

Panksepp, J. (2000). The neurosdynamics of emotion: An evolutionary-

    neurodevelopmental view. In M. D. Lewis, and I. Granic, (Eds.). (2000). *Emotion,*

    development, and self-organization: Dynamic systems approaches to emotional

    development. Cambridge, UK: Cambridge University Press.

Papert, S. (1993). *The children's machine: Rethinking school in the age of the computer*.

    New York: Basic Books.

Park, M. A. (2000). *Introducing anthropology: An integrated approach*. Mountain View,

    CA: Mayfield Press

Parker, I. (Ed.). (1998). *Social constructionism, discourse and realism*. London: Sage.

Pearson, P. D., & Raphael, T. E. (1999). Toward an ecologically balanced literacy

    curriculum. In L. B. Gambrell, L. M. Morrow, S. B. Neuman, & M. Pressley

    (Eds.), *Best practices in literacy instruction*. New York: Guilford Press, p. 22-33.

Pellegrini, A. D., & Bjorkland, D. F. (1998). *Applied child study: A developmental approach*, (3rd ed.). Maywah, NJ: Lawrence Erlbaum and Associates.

Pepper, S.C. (1948). *World hypotheses: A study in evidence*. Berkeley, CA: University of California press.

Pepper, S. C. (1967). *Concept and quality: A world hypothesis*. La Salle, IL: Open Court Press.

Pepper, S. C. (1973). Metaphor in philosophy. In P. P. Wiener (Ed.), *Dictionary of history of ideas*. New York: Charles Scribners Sons.

Perfetti, C. A. (1998). Two basic questions about reading and learning to read. In P. Reitsma & L. Verhoeven (Eds.), *Problems and interventions in literacy development* (pp.15-47). Boston: Kluwer Academic Publishers.

Petitot, J., Varela, F. J., Pachoud, B., & Roy, J. (Eds.). (1999). *Naturalizing phenomenology: Issues in contemporary phenomenology and cognitive science*. Stanford, CA: Stanford University Press.

Pfeifer, R., & Scheier, C. (1999). *Understanding intelligence*. Cambridge, MA: MIT Press.

Phillips, D. C. (Ed.). (2000). *Constructivism in education: Opinions and second opinions on controversial issues*. Chicago: University of Chicago Press.

Piaget, J. (1932). *The language and thought of the child* (M. Gabain, Trans.). New York: Harcourt Brace.

Piaget, J. (1952). *The origins of intelligence in children*. New York: International

Universities Press.

Pinker, S. (1994). *The language instinct: How the mind creates language*. New York:

HarperCollins.

Pinker, S. (1997). *How the mind works*. New York: Norton.

Pintrich, P. R. (1994). Continuities and discontinuities: future directions for research in

educational psychology. *Educational Psychologist, 29*, 137-148.

Plomin, R. (1990). *Nature and nurture: An introduction to human behavioral genetics*.

Pacific Grove,CA: Brooks/Cole Publishing.

Popper, K, (1959). *The logic of scientific discovery*. London: Hutchinson.

Popper, K. (1970). The sociology of knowledge. In J. E. Curtis & J. W. Petras (Eds.), *The

sociology of knowledge* (pp. 649-660). London: Gerald Duckworth.

Posner, M. I. And Raichle, ME. (1997) *Images of mind*. New York: Scientific American

Library.

Potter, J. (1996). *Representing reality: Discourse, rhetoric and social constructionism*.

London: Sage.

Prawat, R. S. (2002). Dewey and Vygotsky viewed through the rearview mirror—and

dimly at that. *Educational Researcher, 31* (5), 16-20.

Prawat, R. S. (2000). Keep the solution, broaden the problem: Commentary on

"Knowledge, self-regulation, and the brain-mind cycle of reflection." *The Journal

of Mind and Behavior, 21 (1 & 2), 89-96.

Prentiss, T. (1998). Teachers and students mutually influencing each other's literacy

practices: A focus on the students role. In D. Alvermann, K. A. Hinchman, D. W.

Moore, S. F. Phelps, D. R. Waff (Eds.), *Reconceptualizing the literacies in*

adolescents' lives. Mahwah, NJ: Erlbaum.

Putnam, H. (1987). *The many faces of realism*. La Salle, IL: Open Court.

Quine, W. V. O. (1969). *Ontological relativity and other essays*. New York: Columbia

University Press.

Rabinow, P. (1984). *The Foucault reader*. New York: Pantheon Books.

Raphael, T. E. & Brock, C. H. (1997). Instructional research in literacy: Changing

paradigms. In C. K. Kinser, K. A. Hincvhman & D. Leu (Eds.), *Inquiries in*

literacy, theory and practice: Forty-sixth Yearbook of the National Reading

Conference (pp. 13-36). Chicago: National Reading Conference.

Redfield, J. (1993). *The celestine prophecy: An adventure*. New York: Warner Books.

Reed, E. S. (1996). *Encountering the world: toward an ecological psychology*. New

York: Oxford University Press.

Reed, E. S. (1988). *James J. Gibson and the psychology of perception*. New Haven: Yale

University Press.

Reese, H. W. & Overton, W. F. (1970). Models of development and theories of

development. In L. R. Goulet & P. B. Baltes (Eds.), *Life-span developmental*

psychology: Research and theory (pp. 115-145). New York: Academic Press.

Reinking, D., & Watkins, J. (2000). A formative experiment investigating the use of

multimedia book reviews to increase elementary students' independent reading.

Reading Research Quarterly, 35, 384-419.

Rex, L. A., Green, J. L., Dixon, C. N., & The Santa Barbara Classroom Discourse Group.

(1998). What counts when context counts?: The uncommon "common" language

of literacy research. *Journal of Literacy Research, 30*, 405-33.

Riegel, K. F. (1976). The dialectics of human development. *American Psychologist, 31*,

689-700.

Rorty, R. (1967). *The linguistic turn: Recent essays in philosophical method*. Chicago:

University of Chicago Press.

Rorty, R. (1979). *Philosophy and the mirror of nature*. Princton, NJ: Princeton University

Press.

Rorty, R. (1999). *Philosophy and social hope*. New York: Penguin Books.

Rosenblatt, Louise M. (1994). *The reader, the text, the poem: the transactional theory*

of the literary work. Carbondale: Southern Illinois University Press.

Rosenblatt, Louise M. (1995). *Literature as exploration* (5th ed.). New York: Modern \

Language Association.

Rosenzweig, M. R., Breedlove, S. M. & Leiman, A. L. (2002). *Biological psychology: An*

introduction to behavioral, cognitive, and clinical neuroscience (3rd ed.).

Sunderland, MA: Sinauer.

Ruddell, R. B. (1994). The development of children's comprehension and motivation during storybook discussion. In R. B. Ruddell, M. R. Ruddell, H. Singer (Eds.), *Theoretical models and processes of reading* (4th ed.,pp. 281-296). Newark, DE: International Reading Association.

Ruddell, R. B., Ruddell, M. R. & Singer, H. (Eds.). (1994). *Theoretical models and processes of reading* (4th ed.). Newark, DE: International Reading Association.

Sameroff, A. J. (1983). Developmental systems: Contexts and evolution. In P. H. Mussen, & W. Kessen,(Eds.), *Handbook of Child Psychology: Vol. 1. History, theory, and methods*. New York: Wiley

Sapir, E. (1921). *Language*. New York: Brace, Harcourt, and World.

Sarbin, T. R. (1998). Believed-in imaginings: A narrative approach. In J. de Rivera & T. R. Sarbin (Eds.), *Believed-in imaginings: The narrative construction of reality* (pp. 15-30). Washington, DC: American Psychological Association.

Scarr, S. (1992). Developmental theories for the 1990s: development and individual differences. *Child Development, 54*, 424-435.

Scheler, M. (1962). *Man's place in nature* (Hans Meyerhoff, Trans.). New York: Noonday Press.

Scheler, M. (1980). *Problems of a sociology of knowledge* (Manfred S. Frings, Trans.). London: Routledge & K. Paul.

Schneirla, T. C. (1957). The concept of development in comparative psychology. In D. B.

Harris (Ed.), *The concept of development: An issue in the study of human

behavior* (pp. 78-108). Minneapolis: University of Minneapolis Press.

Schoenfeld, A. H. (1999). Looking toward the 21st century: Challenges of educational

theory and practice. *Educational Researcher, 28*(7), 4-14.

Schore, A. N. (2000). The self-organization of the right brain and the neurobiology of

emotional development. In M. D. Lewis, and I. Granic, (Eds.). (2000). *Emotion,

development, and self-organization: Dynamic systems approaches to emotional

development*. Cambridge, UK: Cambridge University Press.

Schore, A. N. (1994). *Affect regulation and the origin of the self: The neurobiology of

emotional development*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Schutz, A., & Luckmann, T. (1973). *The structure of the life-world*. Evanston, IL:

Northwestern University Press.

Schwandt, T. A. (1994). Constructivist, interpretivist approaches to human inquiry. In N.

K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 118-

137). Thousand Oaks, CA: Sage.

Searle, J. R. (1992). *The rediscovery of the mind*. Cambridge, MA: MIT Press.

Shaffer, D. R. (2002). *Developmental psychology: Childhood and adolescence* (6th ed.).

Stamford, CT: Wadsworth/Thomson Learning.

Shaywitz, B. A., Pugh, K. R., Jenner, A. R., Fulbright, R. K., Fletcher, J. M.,

Gore, J. C., & Shaywitz, S. E. (2000). The neurobiology of reading and reading

disability. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.),

Handbook of reading research (Vol. 3, pp. 229-250). Mahwah, NJ: Lawrence

Erlbaum Associates.

Shotter, J. (1993). *Cultural politics of everyday life: Social constructionism, rhetoric and*

knowing of the third kind. Toronto: University of Toronto Press.

Shulman, L. S. (1986). Paradigms and researhc programs in the study of teaching: A

contemporary perpsective. In M. C. Wittrock (Ed.), *Handbook of Research on*

Teaching (3rd ed.). New York: Macmillan.

Siegel, D. J. (1999). *The developing mind. Toward a neurobiology of interpersonal*

experience. New York: Guilford Press.

Siegler, R. S. (1996). *Emerging minds: The process of change in children's thinking*. New

York: Oxford University Press.

Singer, H. & Ruddell, R. B. (1970). *Theoretical models and processes of reading*.

Newark, DE: International Reading Association.

Sinha, C. (1988). *Language and representation : A socio-naturalistic approach to human*

development. New York: New York University Press.

Sipe, L. R. (1998). The construction of literary understanding by first and second graders

in response to picture storybook read-alouds. *Reading Research Quarterly, 33,*

Skinner, B. F. (1953). *Science and human behavior*. New York: Macmillan

376-378.

Smith, J. H. (1992). *Telling facts: History and narration in psychoanalysis*. Baltimore:

John Hopkins University Press.

Sokal, A. (1996a, May/June). A physicist experiments with cultural studies. *Lingua*

Franca: The Review of Academic Life, 6 (3), 62-64.

Sokal, A. (1996b). Transgressing the boundaries: Toward a transformative hermeneutics

of quantuum gravity. *Social Text, 46/47*, 217-252.

Speier, C., Palmer, J., Wren, D., Hahn, S. (1999). Faculty perceptions of electronic

journals as scholarly communication: A question of prestige and legitimacy.

Journal of the American Society for Information Science, 50, 537-543.

Spear-Swerling, L., & Sternberg, R. J. (1998). *Off track: When poor readers become*

"learning disabled." Boulder, CO: Westview Press.

Spivey, N. N. (1997). *The constructivist metaphor: Reading, writing, and the making of*

meaning. San Diego: Academic Press.

Stahl, S. A. (1997). Instructional models in reading: An introduction. In S. A. Stahl, D. A.

Hayes (Eds.), *Instructional models in reading* (pp.1-29). Mahwah, NJ: Erlbaum.

Stahl, S. A. & Hayes, D. A. (Eds.). (1997). *Instructional models in reading*. Mahwah, NJ:

Erlbaum.

Stanfield, J. H. (1985). The ethnocentric basis of social science knowledge production. *Review of Educational Research 12*, 387-415.

Stanovich, K. E. (2000). *Progress in understanding reading: Scientific foundations and new frontiers*. New York: Guilford Press.

Stark, W. (1991). *The sociology of knowledge: Toward a deeper understanding of the history of ideas*. New Brunswick, NJ: Transaction.

Steiner, S. F. (Ed.). (2000). *Freirean pedagogy, praxis, and possibilities: Projects for the new millennium*. New York: Falmer Press.

Stressmann, J. E. Zhu, Y., & Queller, D. C. (2000). Altruism and social cheating in the social amoeba Dictyostelium discoideum. *Nature, 408*, 965-967.

Stuebing, K. K., Fletcher, J. M., LeDoux, J. M., Lyon, G. R., Shaywitz, S. E., &

Shaywitz, B. A. (2002). Validity of IQ-discrepancy classifications of reading disabilities: A meta-anlysis. *American Educational Research Journal, 39*, 469-518.

Sweet, A. P., Kamil, M., Alvermann, D., Strickland, D. S. (2001, April). *Reading for understanding: Towards an R & D Program in reading comprehension*. Presentation at Reading Research 2001, New Orleans, LA.

Sumara, D. J. (2000). Critical issues: Researching complexity. *Journal of Literacy Research, 32*, 267-281.

Sumara, D. J. (1996). *Private readings in public: Schooling the literary imagination*. New York: Lang.

Thelen, E., & Smith, L. B. (1994). *A dynamic systems approach to the development of cognition and action*. Cambridge, MA: NIT Press.

Thomas, R. M. (2000). *Comparing theories of child development* (5th ed.). Belmont, CA: Wadsworth/Thomson Learning.

Tierney, R. J. (1994). Dissension, tensions, and the models of literacy. In R. B. Ruddell, M. R. Ruddell, H. Singer (Eds.), *Theoretical models and processes of reading* (4th edition) (pp. 1162-1182). Newark, DE: International Reading Association.

Tierney, R. J. & Shanahan, T. (1991). Research on the reading-writing relationship: Interactions, transactions, and outcomes. In R. Barr, M. L. Kamil, P. Mosenthal & P. D. Pearson (Eds.), *Handbook of reading research* (Vol. 3, pp. 246-280). Mahwah, NJ: Erlbaum.

Tinbergen, N. (1963). On aims and methods of ethology. *Zeitschrift für Tierpsychologie, 20*, 410-429.

Toffler, A. (1970). *Futureshock*. NY: Random House.

Tomasello, M., & Call, J. (1997). *Primate cognition*. New York: Oxford University Press.

Van Beethoven, L. (1994). Symphony No. 5 [Recorded by Orchestra "New Philharmony" St., Petersburg]. On Beethoven: Symphony No. 5: Overtures [CD]. New York: Sony Music Entertainment, Inc.

Van den Broek, P. & Kremer, K. E. (2000). The mind in action: What it means to

    comprehend in reading. In B. M. Taylor, M. F. graves & P. Van den Broek (Eds.),

    Reading for meaning: Fostering comprehension in the middle grades (pp. 1-31).

    New York: Teachers College Press.

Van Geert, P. L. C. (2001). Fish, foxes, and talking in the classroom: Introducing

    dynamic systems concepts and approaches. In H. A. Bosma and E. S. Kunnen

    (Eds.), *Identity and emotion: Development through self-organization*. Paris:

    Cambridge University Press.

Velody, I., & Williams, R. (Eds.). (1998). *The politics of constructionism*. London: Sage.

Venezky, R. L. (1984). The history of reading research. In P. D. Pearson (Ed.),

    Handbook of reading research (pp. 3-37). New York: Longman.

Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: MIT Press.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological

    processes*. Cambridge, MA: Harvard University Press.

Wachs, T. D. (2000). *Necessary but not sufficient: The respective roles of single and

    multiple influences on individual development*. Washington, DC: American

    Psychological Association.

Watson, J. B. (1925). *Behaviorism*. New York: Norton.

Weber, M. (1978). *Economy and society: An outline of interpretive sociology*. Berkeley,

    CA: University of California Press.

Weaver, C. (1994). Parallels between new paradigms in science and in reading and

   literacy theories: An essay review. In R. B. Ruddell, M. R. Ruddell, H. Singer

   (Eds.), *Theoretical models and processes of reading* (4th ed. pp. 1185-1202).

   Newark, DE: International Reading Association.

Weiner, L. (2000). Research in the 90s: Implications for Urban Teacher Preparation.

   Review of Educational Research, 70, 369-406.

Werner, H. (1948). *Comparative psychology of mental development*. New York:

   International Universities Press.

Werner, H. (1957). The concept of development from a comparative and organismic

   point of view. In D. B. Harris (Ed.), *The concept of development* (pp. 125-148).

   Minneapolis, MN: University of Minnesota Press.

Wertsch, J. V. (1998). *Mind as action*. New York: Oxford University Press.

Wertsch, J. V. (1999, April). *Sociocultural analysis of educational settings*. Invited

   Address presented at the annual meeting of the American Educational Research

   Association, Montréal, Canada.

Wigfield, A., Eccles, J. S. & Pintrich, P. R. (1996). Development between the ages of 11

   and 25. In D. C. Berliner & R. C. Calfee (Eds.), *Handbook of educational

   psychology*. New York: Macmillan.

Williams, J. (1998). Knowledge, consequences, and experience: The social construction

   of environmental problems. *Sociological Inquiry, 68*, 476-497.

Yopp, H. K., & Singer, H. (1994). Toward an interactive reading instructional model:

    Explanation of activation of linguistic awareness and metalinguistic ability in

    learning to read. In R. B. Ruddell, M. R. Ruddell, H. Singer (Eds.), *Theoretical*

    models and processes of reading (4th ed. pp. 381-390). Newark, DE:

    International Reading Association.

Zuriff, G. (1998). Against metaphysical social constructionism in psychology. *Behavior*

    and Philosophy, 26, 5-28.

Zwaan, R. A., & Graesser, A. C. (1998). Constructing meaning during reading. *Scientific*

    *Studies of Reading, 2(*3), Entire issue.

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,

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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; Hoyningen-Huene, 1993; Kuhn, 1969).

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

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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 Hegalians. On this score, Pepper expressed some prescient concern whether organicism, as thus constructed, actually qualified as a world hypothesis in its on 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

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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.