

RESEARCH TO PRACTICE

Paradigms of Teaching and Learning: Is One View the Best?

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A few years ago, there was an excellent series of articles in the *Journal of Learning Disabilities* that contrasted the reductionist Newtonian mechanistic paradigm with a holistic/constructivist paradigm. The feature articles were written by Mary Poplin (1988a,b) and Lous Heshusius (1989). Several articles appeared in response to these articles. It may seem that scientists are always attempting to categorize the educational or clinical practices of teachers and clinicians. At the same time, however, educators and clinicians are continually faced with controversial issues that require some commitment or allegiance to a particular theory or paradigm. Consider, for example, the ongoing controversy surrounding whole language instruction. In the January, 1994, issue of the *Journal*, there was a provocative exchange of letters concerning debatable issues in whole language. Or consider the so-called “pragmatics revolution” (Duchan, 1984). Are the revolutionaries no longer assessing and treating syntactic and semantic problems? How does one decide where one stands on these issues without understanding the principles that underlie the various views?

In this article, I review the principles and shortcomings associated with the mechanistic and holistic paradigms, drawing heavily on the works of Poplin and Heshusius and the respondents to their articles. The discussion of mechanistic and holistic views is not meant to force clinicians to choose between the two views. Rather, the main purpose of such discussions is to help us understand our own beliefs and practices. As I noted in an earlier article (Kamhi, 1993), clinicians need to exploit the plurality of theories and areas of knowledge that have a direct impact on clinical service.

What Is a Paradigm?

Ever since Kuhn (1970) brought the concepts of paradigm and paradigm shifts into fashionable use, discussions about whether a paradigm shift has occurred or should occur have been prevalent across the sciences and social sciences, as well as across education and clinical fields such as speech-language pathology. Heshusius (1989) notes, however, that Kuhn

used the term paradigm in at least 21 different ways. Importantly, paradigms are not equivalent to theories. The concept of a paradigm is much more encompassing than that of a theory. To paraphrase Heshusius (1987, as cited in Poplin, 1988, p. 389), a paradigm presents a world view, a way of seeing; it represents the beliefs by which we ultimately think and act. Paradigms make explicit how we think about the phenomena of interest. Understanding paradigms demands a self-consciousness of ourselves as knowers, an understanding that we as knowers are part of the very paradigm we know.

The Mechanistic Paradigm

Drawing on a number of sources, Heshusius (1989, p. 405) describes the key assumptions of the mechanistic paradigm and its impact on special education. The nature of a mechanistic reality is characterized as objective and reductionistic, meaning that the dynamics of the whole can be understood from the properties of the parts. The nature of reality is determined by gathering sufficient data, while the nature of progress is deterministic, additive, and the same regardless of personal meaning and context. The nature of the organism is reactive.

These assumptions have been translated into special education theory and practice in the following ways:

1. Knowledge is objectified, quantified, and ranked.
2. Learning involves lengthy sequences of processes, behaviors, and strategies, and is associated with the mastery of predetermined, known curriculum outcomes.
3. Learning also involves isolated skill training, worksheets, bottom up approaches, task analysis, and programmed and sequentialized materials.
4. The principles of learning are behavioristic, involving stimulus control, reinforcement, and unidirectional control of curriculum by teacher.

5. There is a focus on deficits in the student.
6. Causal links are assumed between diagnoses and instruction.

Where Heshusius associates the mechanistic paradigm primarily with behaviorist principles of teaching and learning, Poplin (1988a) argues that the four major models that have influenced the field of learning disabilities (as well as speech-language pathology) reflect the reductionist principles of the mechanistic paradigm. The four models include (a) the medical model of the late 1950s, (b) the psychological (psycholinguistic) process model of the 1960s (reflected in the use of the ITPA), (c) the behavioral model of the 1970s (characterized by task analysis and behaviorist learning principles), and (d) the cognitive strategy model of the 1980s that involved teaching students the strategy behaviors necessary to perform various academic tasks.

Poplin feels that each of these models suffers from reductionist commonalities that reduce the problem of learning disabilities, the teaching/learning process, and the delivery of educational services. For example, the models reduce the teaching/learning process by (a) organizing objectives in a sequential and hierarchical manner that leaves the learner predominantly passive, (b) designing treatment that is deficit driven, (c) segmenting learning into parts, and (d) assuming a right and wrong posture about the teaching and learning process.

The models reduce the delivery of educational services by almost exclusively promoting school goals rather than life goals, supporting the segregation of students into different categories, and reducing the service delivery system to a series of steps and sequences. With respect to the latter point, Poplin notes that although procedures and endless paperwork are necessary for political and economic reasons, it is not necessary to rationalize that these procedures are good for students.

Heshusius (1989) provides a nice summary of the problems with the mechanistic paradigm in special education:

...special education has not been wrong so much as it has attempted to do what we now know is impossible: to force the innately unpredictable into the predictable, the unmeasurable into the measurable, and wholeness into fragmentation. It has attempted to transform teachers and students into reactive individuals. (p. 411)

The Holistic Paradigm

The change from a reductionist, mechanistic view to a holistic, constructivist one involves a shift from a machine metaphor to a human metaphor. The essence of holism is a focus on the individual as a human organism rather than a machinelike mechanism. A fundamental holistic assumption is that the properties of the parts can be understood only from the dynamics of the whole. The whole is different from and more than the sum of its parts (Heshusius, 1989, p. 411–412). Kent (1990) has noted that wholeness is embodied in the word “individual,” which means “undivided.” The individual is viewed

as an undivided organism consisting of highly interactive systems. A focus on the individual leads holists to emphasize the importance of self-regulatory, self-organizing, and self-evaluative behaviors. For Reid (1988) and many others, the inherently active, self-regulating organism is the pivotal cornerstone of the shift from reductionist to holistic thinking.

Since the early part of the century, nonreductive ways of seeing phenomena have been and are being developed in every field from physics to education. The emergence of a holistic paradigm is often traced back to the discoveries about relativity and quantum physics that provided an alternative to the Newtonian view of the world. Poplin (1988b) identifies a number of principles and tenets that characterize the holistic teaching/learning process:

1. The whole of the learned experience is greater than the sum of its parts.
2. The learner's knowledge is self-regulating and self-preserving.
3. All people are learners, always searching for and constructing new meanings.
4. The best predictor of what and how someone will learn is what they already know.
5. Learning often proceeds from whole to part to whole.
6. Errors are critical to learning.
7. Learners learn best from experiences about which they are passionately interested and involved.
8. Goals of instruction should be more life-related (such as literacy and cooperative learning) rather than school-related (such as basal readers, worksheets, and textbooks).
9. Reflection, creation of questions, and construction of personal interpretations are more critical than correct and accurate answers to prepared questions.
10. Form follows function and meaning; premature instruction in accurate forms may inhibit learning.

Many of these tenets and principles are not new to speech-language pathologists. Holistic notions underlie many of the procedures used to assess and treat children with speech-language disorders (Brinton & Fujiki, 1991; Fey, 1986; Gallagher, 1991; Kent, 1990; Lund & Duchan, 1993; Nelson, 1993; Owens, 1991). Kent (1990), for example, has written that

as practitioners we must respect and try to apprehend the values and beliefs of our clients. These values and beliefs are part of a life-story narrative and they are indivisible from a client's anatomy and physiology....The results of a battery of tests [then] should be seen as disparate fragments of a person. The unity of personhood is beyond any approach to quantification. (p. 12)

One of the most prevalent applications of holistic notions to language is found in the increasingly popular whole language approach to teaching reading (Goodman, 1986; Smith, 1982). Consistent with holistic principles, the whole language approach views language as an integrated system that is more than the sum of its component parts, and language learning as an active constructive process (Norris & Damico, 1990). Norris and Hoffman (1993) have recently written a book applying whole language principles to language intervention.

Reaction

A few years ago, in a chapter on different language perspectives (Kamhi, 1992, p. 59), I attempted to summarize the good and the bad about holism. Let me attempt to paraphrase what I said back then. I began by recognizing that there was an inherent appeal in holism. Being human, we are naturally attracted to assumptions and principles that emphasize humanism, unity, meaning, purpose, qualitative judgments, and so forth. Holistic assumptions should be particularly attractive to teachers and clinicians who are disenchanted with reductionist, fragmentary, programmatic approaches to teaching and learning. It seems difficult to find fault with holistic assumptions that emphasize wholeness rather than fragmentation and qualitative judgments rather than quantitative measurements. Why would anyone want to embrace mechanistic or reductionist assumptions when the alternative is holism and humanism? These terms, like whole language, seem to have been designed to be opponent proof. Would you rather be called a reductionist or a holist?

So what is the problem with holism? Unfortunately, there are a number of them.

Despite what I feel is a personal commitment to many of the principles and tenets of holism, I do not think holism is the only paradigm that results in effective learning and teaching, and I strongly object to claims that any one theory, set of theories, or paradigm is somehow morally superior to others. In addition, I will argue below that in their attempt to promote the advantages of the holistic paradigm, Poplin, Heshusius, and others exhibit the kind of reductionist thinking that they attribute to others.

Reductionism, as defined by Poplin (1988a, p. 394), "is a natural process by which we break ideas, concepts, and skills into parts in an attempt to understand and deal better with the whole." The problem with reductionism, referred to as "the reductionist fallacy," is when one assumes that a complex whole is identical with its parts and causes, and/or that the whole can be entirely explained in terms of its parts and causes. Although Poplin clearly distinguishes between the natural and presumably acceptable kind of reductionism and the reductionist fallacy, this distinction seems to get lost in holistic claims about the problems with reductionism. One gets the impression from holistic rhetoric that emphasizes treating language as a whole and treating the whole child that any kind of reductionism is inconsistent with holistic principles.

It should be apparent, however, that teaching and learning depend on the reduction of complex ideas, concepts, and skills. Complex behaviors such as language need to be re-

duced in order to be taught and learned. For example, one cannot teach children to be better communicators without focusing on some specific aspect of language or communication. Students in speech-language pathology cannot learn about language without learning about its components (e.g., syntax, semantics, pragmatics, phonology) and the factors (e.g., cognitive, social, biological) that influence these components. Holists reduce language, too; they just tend to reduce language to large discourse and text-level units rather than small phoneme, word, or sentence units. Holists also stress the interactive nature of the components of language and the importance of context, meaning, intentions, and belief systems on language. But one must impose some organization or structure on these interactions, and this structure is a form of reduction. This kind of reductionism, however, is a natural process that underlies all teaching and learning, whereas the reductionist fallacy is not a natural process and may detract from teaching and learning. It is crucial to understand the difference between the two.

It is no doubt ironic that one of my main problems with the holist-mechanistic dichotomy as presented by Poplin, Heshusius, and others is that in their attempt to promote the advantages of the holistic paradigm, they fall prey to the reductionist fallacy that they abhor. Rather than recognize the important differences among theories that may have reductionist components, Poplin, for example, uses a Procrustes bed to force (reduce) all non-holist theories into the mechanistic paradigm and then dismisses them all because they suffer from common limitations of the paradigm. In forcing four diverse theories into the mechanistic paradigm, Poplin is guilty of believing that each of the theories is identical to one of its mechanistic parts. But each theory is more than the sum of its parts; instead of emphasizing the commonalities among the four theories, one could emphasize the important differences among the four theories and get a very different result.

Reid (1988), in her response to the Poplin articles, addresses these problems from a slightly different angle. She rhetorically questions whether holism is the only alternative, the only view/paradigm that provides insights into teaching and learning. The answer, of course, is no. Reid goes on to show how information processing theory, though an imperfect, mechanistic model, is based on the assumption of an inherently active, self-regulating learner. Reid cites the work of Brown and Bransford (e.g., Brown, Bransford, Ferrara, & Campione, 1983) who developed a tetrahedral model of learning that emphasizes the dynamic interaction among characteristics of the learner, learner activities, criterial tasks, and materials to be learned. This view of learning requires a conception of teaching that is learner centered, contextual, and holistic. Holistic principles can also be found in behaviorally oriented procedures. Kimball and Heron (1988), in their response to Poplin, show how their behavioral task analyses view the child as an active learner, and how student experiences and learning history are an important part of the instructional process.

Consider another example. Holism focuses particular attention on belief systems and values of the individual and the extent to which these systems influence other systems such as language. As Kent (1990) has noted, holists view

values and beliefs as part of a life story narrative that is indivisible from a person's anatomy and physiology. One does not have to be a holist, however, to recognize the importance of in-depth client/family interviews and detailed developmental histories. Although the amount of information obtained may vary from clinician to clinician, interviews and client/family histories have always been an integral part of assessment procedures in speech-language pathology.

Many other examples can no doubt be found of holistic principles operating in educational and learning situations that have been characterized as reductionistic and mechanistic. By claiming that holism is the only view that embodies all the principles and tenets that foster teaching and learning, proponents of holism may alienate many individuals who are just as committed to teaching and learning as they are. Reid (1988) expresses some of these concerns in noting that we are likely to be more successful in the long run if we take into account where teachers are and press for evolution rather than revolution. Again, it is ironic that in pressing for revolution, Poplin and, particularly, Heshusius, fail to follow one of the principles of holism: The best predictor of what and how someone will learn is what they already know. If teachers/clinicians are as tied to mechanistic, reductionist teaching as holists think they are, a change to holistic teaching may come more readily if they are shown the ways in which their current teaching approaches already reflect some holistic principles. One could then build on the existing base of holistic teaching and gradually increase the commitment to holism.

Forness (1988), in his response to Poplin, points out that despite her claims of failure, there is a rich body of literature demonstrating the effectiveness of instructional procedures emanating from purportedly reductionist models (e.g., Mastropieri & Scruggs, 1987). The same could be said about the effectiveness of treatment procedures in speech-language pathology (e.g., Warren & Reichle, 1992; Warren & Rogers-Warren, 1985). In contrast, Forness finds a lack of evidence showing that holism is an *effective* (his italics) paradigm. Effectiveness aside, Forness discusses the danger inherent in Poplin's insistence that holism is the *only* (his italics) valid path to effective learning:

Experience with certain learning disabled children in those classrooms espousing a more holistic perspective suggests that some indeed continue to require much more externally imposed structure than such methods provide. The fallacy of "one theoretical perspective fits all" has been the reason for much of the failure of our current instructional programs. (p. 423)

I could not agree more. In discussing clinical expertise in speech-language pathology (Kamhi, 1994), I wrote that enthusiasm, belief, advocacy, and parental support may be more important than specific teaching methods and procedures. Echoing this theme, Reid has written that

the most effective teachers—because they are caring and responsive—are able to help children bridge the gap between the new and familiar, create experiences for children that make learning exciting and meaningful, and thereby enable children to maintain their own integrity as developing, living systems. (p. 419)

These critical, primarily social functions of negotiation and transformation, Reid notes, are rarely taught in our educa-

tion programs and often are not addressed in education research. Holism, with its emphasis on the whole interactive organism, can help focus our attention and energies on these very important social and value-laden interrelationships.

Coda

Clearly, holism has a lot to offer. Adhering to holistic principles and tenets will surely help facilitate learning in many children with speech and language disorders. At the same time, all children do not learn the same way. As indicated earlier, some children may need more directed instruction than others. In addition, although language components are interactive, some components are more independent (autonomous) than others, and this independence may vary in individual children. Effective clinicians are able to adapt and tailor treatment procedures according to the strengths and weaknesses of individual children. The focus is on the individual, as holism prescribes, but there is no proscription against the use of teaching methods and approaches that may be inconsistent with other holistic principles.

There is no foreseeable end to debates about which theory or paradigm provides the best explanation for teaching and learning. I have always had a begrudging admiration for those who have the commitment and fervor necessary to believe that a particular theory or paradigm provides the best explanation for complex processes such as teaching and learning. Without such fervor and commitment, it is easy to slip into the tentacles of relativism, which holds that different theories or paradigms can have strengths as well as weaknesses. In reading the articles by Poplin, Heshusius, Reid, Forness, Kimball, and Heron, it is clear that despite the differences in these authors' views, all are strongly committed to providing the best services for students with learning problems. The commitment to students is sometimes obscured, however, by the claim that holism is the only paradigm that leads to effective teaching, and by the use of a passionate and occasionally pejorative style to dismiss all alternative notions of teaching and learning. There is nothing wrong with a passionate commitment to a particular theory or paradigm as long as those with such feelings recognize that there may be different ways to achieve the same teaching and learning objectives. The lack of commitment to a particular theory or paradigm may reflect the belief that the use of a plurality of theories from different paradigms is necessary in order to provide the best services for the children we serve.

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