Child Development

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Theories in developmental psychology and theories about teaching the English language arts are furthest apart when developmental psychology has nothing to say about teaching, when it attends focally to the evidence that the child constructs his own knowledge, and when it fails to address the roles assigned by society to teachers. Conversely, when teaching is seen as the delivery into children of content and skill by didactic instruction, or the use of teacher-proof curricula that calls for no developmental wisdom, or nothing more than publishers' programs, these positions ignore the highly relevant insights about children's learning that exist in developmental psychology. The work of both disciplines is closely allied when researchers document in precise ways the effects on children of real-world interactions and when they search for theoretical explanations of how and why children's responses change over time. The two disciplines have shared interests in recent studies of parent-child interaction, tutoring by novice tutors, adults talking with children especially in schools (Cazden, 1988), all of which show how the apprentice learner gradually assumes a self-monitored role.

The child study movement of the early 1900s emerged from the innovation and international interchange of the 1930s as developmental psychology (Senn, 1975). Like the parent discipline of psychology, it placed high value on empirical evidence gained under controlled conditions and theories grounded in data.

The methodological and theoretical uniqueness and challenge of a development orientation (Baltes, 1983) are reflected in its goals, namely

1. to describe change over time in behaviors, abilities, and processes;

2. to explain what occurs; and

3. to optimize opportunities for enhanced development.

Optimization may call for interventions that establish external or internal resources to allow for optimal development, or programs that modify problematic behavior. A diversity of philosophical, theoretical, and methodological orientations are found at the cutting edge of current debates (Lerner, 1983), but there is a major focus today on internal, cognitive, strategic, and affective variables as prior and causative. Learning contexts influence behaviors and cognitive processes in important ways, and the problem of how to study the process of learning during interactions is a challenge to researchers.

Interpreted broadly, formal education fits comfortably into this goal of optimization: its central enterprise can be seen as a myriad of interventions in children's lives during formative years of change. Educational researchers also record cumulative change over time as children learn, with their empirical evidence ranging from that gained under controlled conditions (evaluation or assessment) to telling accounts in individual biographies. In such descriptive research, learning is conceptualized broadly as something that occurs in or out of school, with

or without instruction. Such research recognizes that some changes in children occur under the control of historical and societal factors, others are determined by the child's selection of what to attend to, many are brought about in interaction with significant others, and some result from what is delivered more formally in classroom programs.

There is no clear distinction between the two disciplines when educational researchers pursue questions to the level of explanatory theory tested against competing alternatives, or when developmental psychologists test theories in interventions in the real world of schools. More commonly, developmental psychologists focus more on research designs and questions that will yield explanations and educational researchers attend to effective optimization as a goal. There is a search for both a better explanation and a more effective program.

Since 1970, the need of societies to solve problems by changing the next generation of school children produced different research pressures in psychology and education, complicating the transfer of information between them. Education received calls for accountability and for higher standards while hearing arguments to narrow its focus, which seemed blind to what was known about child development, while developmental psychology broadened its scope from highly controlled experimental studies to consider the ecologies within which children learned (Bronfenbrenner, 1979). In part this led to a more culturally aware and

activist stance, and involvements in interventions with underprivileged children (Welkart, Rogers, Adcock, & McClelland, 1971).

In this paper, brief comment on research interests shared by the two disciplines in oral language, writing, and reading is followed by a more general analysis of congruence and communicative distance between them.

The Acquisition of Language

Oral language

Language acquisition has been richly generative of challenges to educators. It is clearly cumulative, its foundation is laid before entry to school, and most of it is completed in interaction with significant others but without direct instruction (Lindfors, 1987). Preschoolers use it to code cognitive stores of information and acquire processes for accessing that information. They derive order and structure for language from massively different and diverse samples, test and refine their values for production, and are barely conscious of any of these processes. The learning is often initiated by the child, although adults and older children may pace the learning and provide appropriate information that the child is able to use. It does not proceed by accurate performance with the use of correct grammar. This is important, because how would the brain construct self-monitoring and self-correction processes if it never made an imperfect response? By being partially correct, the child progresses to more control over complexity in the use of language. Accuracy is the outcome, not the process, of learning.

In the 1960s as psychologists came to terms with the linguists' conceptual approaches to syntax, attention to detailed protocols of individual progress placed the spotlight on the importance of interrelationships between parts of the utterance and the organization of language on several levels. When linguists began to explore the links between structure and meaning, developmental psychologists found themselves in familiar territory with knowledge about cognition and how we understand language. As interest turned to the pragmatics of language use, it was easy for educators to recognize the influence of familiar contextual variables—settings, home influences, cultural factors, discourse factors, dialect differences. By 1975, oral language was seen in rich perspective, with important implications for teaching, for the valuing of cultures, and for bilingual education. Since then, the interactions of language, culture, and education have received attention as ethnomethodological approaches have been tested and refined (Heath, 1983), cultural factors explored (Au & Kawakami, 1984), and classroom discourse analyzed (Cazden, 1988).

Perhaps because children seem to have well-formed response systems for comprehending and producing language prior to entering school, the continuing development of oral language during schooling is not often seen by teachers to be important. In fact individual differences in oral language achievement vary greatly. While teachers see oral language as central to writing and reading acquisition, they often do not recognize the need to foster its further development. Multicultural or bilingual challenges in most English-speaking countries have led to a new awareness of oral language issues, which may direct more attention to the ways in which the language of the child at home undergoes further development during schooling.

Writing

Three slim volumes appeared by 1978 which detailed observations of young children writing (Clay, 1975; Graves, 1978; Read, 1975). Graves placed prime emphasis on the observation of the writing processes used by children who were encouraged to be writers. Read discovered children who analyzed the sounds they could hear in their own pronunciation of sentences and invented a writing system for themselves. Clay collected weekly writing samples from an age cohort of children in five schools throughout their first year of school. An area that had been confined by beliefs about motor incoordination, having to be correct, needing to read before you could write, and getting images of spellings into the brain, began to expand with new vigor. Today even preschool children are seen as writers. Attention focused on

a. how to look at children's writing,

b. how to look for processes of change, and

c. how to evaluate change.

Writing acquisition had surprising similarities to oral language. Children made responses that were systematic rather than random, and they occurred across children, even across countries and languages (Ferreiro & Teberosky, 1982; Goodman, 1990) as if children were operating on rules they had discovered for themselves. Children were hard to shift from such positions pointing to cognitive

involvements. Questions were needed to elicit the rules or assumptions that children were using. Researchers could almost see cognitive processes in operation as they recorded children in classrooms composing messages, and monitoring their oral production against their written composition at sound, sound cluster, word, or phrase level within the text as a whole, using recursive strategies of reviewing and revising (Graves, 1983; King & Rentel, 1979).

Reading

By analogy reading acquisition might have been viewed constructively, i.e., something that the child put together, except that reading instruction has a long history of polarized theoretical positions. In lay minds, there are two superficial descriptions of beginning reading instruction, one at the letter level (phonics) and one at the word level (sight vocabulary). A wealth of writing on communication, information, and linguistic theory (Miller, 1951) showed how language transmits information on several levels. Research directed the attention of teachers to variables that found no place in the stripped-down versions of decoding and sights vocabulary theories—research on children's syntactic errors in reading, the role of context and meaning, the links within stretches of texts called cohesive variables (Chapman, 1983), and memory experiments that showed how children related prior experience to new text. These research results were consistent with textual approaches to reading and writing.

Strategic reading is seen by many educators as something that older readers learn: rereading to comprehend (Garner, Wagoner, & Smith, 1983), skimming ahead for organiza-

tional structure, using context to process unfamiliar words (Potter, 1982), summarizing text to ensure understanding and remembering (Palincsar & Brown, 1984), and comprehension monitoring (Wagoner, 1983). That earlier forms of each of these strategies occur in the young reader (Baker, 1984; Clay, 1979) if instruction allows for it, is inconsistent with the advocacy of "decoding first and comprehension later." Unlike oral language and writing research, there have been few continuous longitudinal studies of reaching processes in formation, with a result that young speakers and writers are seen as building their competencies and young readers receive them from their teachers and/or texts. The weight of research on early reading is on how cognition and teaching interact at the level of phonological awareness, to the neglect of other levels of language knowledge which might be powering the progress. Recent attention to the interactions of reading with writing may take us out of this strange situation (Langer, 1986). [See chapter by Tierney in this book on longitudinal studies.]

The Contribution of Developmental Theory

In the first half of this century psychoanalytic theory with its focus on the study of the individual child provided a strong developmental emphasis for the education of young children in British education from the time of Susan Isaacs (1935) to the Plowden Report (1967). In the United States, the strong influences on education from psychology were from associationist or behavioral theories, which could be applied to children being instructed in groups; at that time developmental psychology

studied children's development before they went to school and in their out-of-school lives. In contrast to Britain and the United States, the Soviet Union's developmental psychology was directed, even in the 1930s, to pedagogical issues (although it only reached Western countries in translation to the 1960s) and work from that period is central to important research on children's learning today (Vygotsky, 1962; Wertsch, 1958).

For 50 years Piaget's theory of cognitive development evolved, expanded, and provided an approximation to a theory that might account for all development and learning, an "inclusive model" (Cairns & Valsiner, 1984). Children not only carried out cognitive operations, but used processing strategies, coded experiences, and compiled records of experiences stored as memory schemas. Piaget's description of assimilatory and accommodation processes presents teachers with the option of going with the child or against the child in one-to-one teaching, but provides only very general guidance for the design of day-to-day cumulative instruction of groups for children in classrooms (Goodman, in press). Critical evaluation of the contribution of Piagetian theory to teaching has led to the concept of the competent preschooler (Donaldson, 1979) and to theories that challenge the role of conflict in cognitive change (Bryant, 1982, 1984).

Current analysis of Vygotsky's theory is focused not on his concept of inner speech, only partially on his social theory, and mostly on his concept of the zone of proximal development. His challenge to current teaching practice is that he sanctions shared activity between tutor and learner so

that the learner can complete more difficult tasks with help that he would not complete on his own. He is supported in the beginning but gradually takes over the entire task. The help of the expert becomes unnecessary as learners become able to assume control. Education does not have to be an activity on which the child must always work solo on unseen material. While these ideas can be easily fitted to concepts of teaching they do not reflect the depth of the theory which claims that the shared and supported activity allows the child to construct some inner generating system, which will initiate and manage learning of this kind independently on future occasions.

Many abilities are now regarded in developmental psychology as "alterable variables" and potential targets for education. Researchers study the procedures children use to get to solutions, like cognitive strategies and self-monitoring (Flavell, 1982), and provide explanations of how we understand speech and texts arguing that 'scripts' have causal effects on achievement (Schank & Abelson, 1977). Even intelligence is seen as a matter of dynamic processes, rather than fixed static states (Sternberg, 1984; Pintrich, Cross, Kozma, & McGeachie, 1986).

How do developmental theories influence teachers' assumptions about children? The explanations provided, particularly in language and cognitive areas, have created for teachers a vocabulary and knowledge structures that allow them to think beyond what the child does to what may be occurring in children's heads. It is the purpose of scientific study to go beyond the detailed variability of individual differences and the surface plausibility of what is observed, to

less obvious phenomena and more general statements of relations. This is a position to be treated very seriously. Education needs to know why developmental psychology works in the ways it does.

However, the need to test particular developmental theories on certain age groups has led to an uneven spread of information with most attention going to the preschool years (ages 4 to 6), followed by the early elementary years (ages 6 to 9), and the intermediate years (ages 9 to 12) (McCandless & Geis, 1975), and with adolescence a poorly researched age group. Recent research on infants and toddlers has overcome an earlier neglect, and lifespan developmental psychology is theoretically strong but empirically young. Such coverage serves early childhood education well but not schooling in later years.

Theories of child development influence teachers' assumptions about why children behave the way they do, rather than their decisions about how and what to teach. There are particular risks when the theories applied belong to another age, arose from a different knowledge base, and may be distorted by the time-warp. For example Wertsch (1985) had to use Soviet authorities who wrote long after Vygotsky's death to explicate Vygotsky's work; Gesell's attempt to characterize the mismatch between some children's learning needs and instruction demands is used today to exclude children from instruction and so from opportunities to learn. Bloom's (1971) theory of how the scores of average achievers can be lifted two standard deviations by teaching in certain ways can be applied as a concept of mastery learning that looks like pouring content into empty vessels more demandingly.

The Contribution of Methodology

In the area of methodology, the two professional areas can negotiate concurrent rather than derivative exchanges. A question in education may be explored by the newest methodology and the best available analytic logic in developmental psychology at the point of beginning the investigation. "Join our team and when we get there you will know as much as we do and avoid the lag in the transfer of information," could be a useful idea.

Critical for more effective interchange between the two disciplines is a need to appreciate the logical linkages between theoretical issues, research designs, statistical analyses, and interpretations (Baltes, Reese, & Nesselroade, 1977; Bryant & Bradley, 1985; Pintrich et al., 1986). Theory testing and experimental controls in psychology are necessary to answer some kinds of questions for which observational and participant observation methodologies are not alternatives, because they address important but different questions.

Experimental or longitudinal studies that compare age groups can only produce descriptions of change in children consistent with discreet stages. Gradual change in process or knowledge, which teachers find a better match to what they see in classrooms, is more likely to emerge from intensive longitudinal studies of change over short intervals.

Where developmental psychology has paid detailed attention to what happens in the course of development, with manipulative and precise measurement of change in children's responses, it provides good models for education, and for teachers to

monitor whether good outcomes are occurring. Ideas of what, when, and how to begin teaching, of the changes that may be expected over time, of the track that most children take, of the variability to be expected, and of different development paths to the same outcomes could emerge from developmental research designed for this purpose.

Piaget's clinical method, used to study children's cognitions in depth, had an important impact on the acceptability of talking to children about their understanding (Ferreiro & Teberosky, 1982; Karmiloff-Smith, 1979). Roger Brown (1973) and his eminent students began a search for description of language acquisition with in-depth data from the language of three children. The new emphases required careful recording of daily change, small-scale manipulations, and analyses of particular features, trying to model the inner structure to account for the outer behaviors. Studies in the Soviet Union of sensory features used a similar kind of detailed observation, asking what was behind the behavior change.

Longitudinal research is highly relevant to the understanding of change over time needed in education; it is essential for the study of prediction, for understanding the origins of individual differences, and for the evaluation of outcomes of educational programs (Sontag, 1971). It is a method too rarely used, and almost never applied to a total cohort of children across the whole normal curve, varying in age as they do in real classrooms and under the normal school conditions within which children are taught. Yet descriptive data of learning processes in classrooms is

very useful in education (Nicholson, 1984). If teachers became researchers of change over time in the day-to-day, small-scale sense (Pinnell & Haussler, in press) this could enrich assessment and evaluation of children's progress.

Detailed description of process changes in successful learners may well provide teachers with appropriate guides for what the poor learners need to be taught to do in what education regards as 'basic' subjects (Clay, 1985).

Different Priorities

While there are many points of congruence between the two disciplines, there are many reasons for communicative distance to arise between research on teaching the English language arts and research in developmental psychology. A recognition of some of these reasons may improve the potential for dialogue between two important areas of research endeavour.

Questions and answers

While developmental psychology must take time to pose its questions and systematically test its explanations in a scientific way, education must act on today's best available knowledge for current programs and tomorrow's plan for changes. Teachers need answers to build into practice; psychologists want questions that lead to breakthroughs in understanding. Researchers in both disciplines will be problem solving in similar areas but with different goals. What counts as relevant is different and is liable to lead one group to ignore what the other group is finding out.

Selecting the subjects

Teachers must deal with all children; they present the kind of diversity that developmental psychology seeks to control in its research designs. Teachers face the average majority, extreme subgroups, and particular individuals with learning challenges all at the same time. In order to obtain a clear test of an hypothesis, developmental psychologists select appropriate samples of children. Their findings may be clear but will usually apply only to some of the children in a mixed classroom who have to be taught today, and only extremely rarely to all of them. This problem can lead to impatience on the part of educators with psychological research and an unwillingness to consider its findings.

'The whole learner' versus 'particular processes'

The teacher's job is to work with all aspects of the child's functioning impinging on a single task. Teachers know that it is the individual child who interacts in some holistic way with the specific task at a particular time. Developmental psychology tries, in its advocacy, to remember the whole organism, and research has been directed to the links between perception and reading, cognition and language, culture and learning, classroom discourse and child learning, and contexts and outcomes. However, it is the nature of the developmental psychologist's work to search for explanations in specialized area, to tease out the specific, eschew the complex, explicate processes, avoid global theory, and oppose unwarranted generalization, thus tending to exclude holistic theories.

Common Research Problems

Achievement outcomes do not define curricula inputs

Research findings of what children typically do at selected ages describe in step-wise form sequences of achievements, which are the outcomes of learning. Those error-free end-results, which are the outcome of many false starts, half-correct processes, and much self-correction en route to a recognizable product or achievement, have sometimes been built into curricula by educators in their perfected form. The appropriate research questions relate to how this "now perfect performance" was acquired, and records of the changes that took place en route to perfect performance will provide a better guide for the curricula of learning than study of the perfect outcomes of instruction.

Education is not about putting in the outcomes; it is about knowing what inputs, in what contexts, give rise to the desired achievement outcomes. In current debates about phonological segmentation in reading, metacognitive awareness in oral language, or the importance of correctness in writing, the distinction is not made between where you begin and where you end up.

For example, if the child learner constructs knowledge from learning interactions, then finding that competent readers score well on tests of phonological awareness does not imply that one should teach phonics, but, rather, that one should study change over time in younger children and document the sequences of interactions by which they reach that final tested state. Perhaps, like language acquisition, there are many inputs of different kinds which can contribute to the desired outcome. The fact that most children learn to read in very different instructional programs suggests that this may be the case. Developmental psychology is rich in understandings of this problem in a slightly different form. It accepts that change over time must be studied on individuals who change over time. Language acquisition research has illustrated how individuals learn from different language samples on different time scales, taking different paths to similar goals of talking fluently. What they need to learn cannot be interpolated from the average scores of separate samples of 3-, 4-, 5-, 6- and 7-year-olds. In the school years, it has been common for designers of educational interventions to try to achieve change in individuals on the basis of evidence derived from cross-sectional norms. Differences between individuals do not describe what is required to achieve change within or by individuals, and interventionists in both disciplines have often failed to recognize this (Montada & Filipp, 1976). A normative description of change is a gross approximation and does not provide a satisfactory basis for designing an instructional sequence.

Interactions are hard to study

Riegel (1979), impressed by the dialectical world view of developmental psychology, chided the discipline for describing either the responses of the adult (parent or teacher) or the child during learning interactions and not doing the harder task of studying the interactions themselves. Two design and analysis problems are that interactions occur in sequences, and that any one response affects the subsequent responses of either or both parties. (That is, of course, one description of instruction.) Research designs in behavioral psychology, language acquisition research, the studies of Bruner (Bruner & Sherwood, 1976; Bruner & Garton, 1978), classroom discourse, and ethnomethodological research could be the source of innovative methodologies for interaction research. An emphasis on the sensitive observation of children shifts easily to the observation of interactions, and a new guide to the observation of interactions (Bakeman & Gonam, 1986) will be helpful.

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Some Final Thoughts

A beginning has been made

Vygotsky's theories (1962; Wertsch, 1985) of the support system provided by others for the learner at the growing edge of their competence (Bruner, 1986) come almost as a confirmation of recent developments (Au & Kawakami, 1984; Clay, 1985; Palincsar & Brown, 1984) and adults have been shown to work in this way tutoring preschool children (Wood, Bruner, & Ross, 1976). "Teachers scaffold budding reading skills through prompts and examples and then foster individual control of reading by gradually removing social supports" (Pintrich et al., 1986). There is more than a scaffold involved, however, because the learning in the

language and cognitive areas leaves the learner not only with the production of performance but with the inner structures and functions capable of generating these (Karmiloff-Smith, 1986).

Updating the knowledge base

A somewhat disturbing claim in recent years has been that we can predict very little about the way an individual will change from infancy to adulthood (Lipsitt, 1982), or about the way selected behaviours will be achieved from one historical era to another (Baltes et al., 1977; Elder, 1974; Learner, 1983). Group predictions often do not hold up for individuals, and they do not hold up even for groups if the social contexts in which we learn are undergoing change. These claims are disturbing, because education operates on assumptions about accumulating expertise and continual change in expected directions during childhood (Kagan, 1983), and the degree and direction of expected change are derived from the average majority. Awareness of such claims implies that knowledge about children gained from research should be checked at quite short intervals, since today's research populations may be responding differently from the original research populations. Replication studies should be funded, as neither discipline would want its outdated information to limit the learning opportunities of today's children. This becomes more important today, because a hypothesis currently receiving some attention from developmental psychologists is that schooling may influence cognitive development in important ways.

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