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## *The Knowledge Gap: Implications for Early Education*



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Today, the United States is experiencing an almost unprecedented sharp increase in economic inequality (Browning, 2003). Wealth distribution—the differences between low-income families and middle- and upper-income families, or the so-called haves and have-nots—is greater now than at any other time in our history since 1929 (Gaziano, 1997). And the ramifications of such income differentials are significant and have far-reaching effects, not only for the earliest years of children's literacy development but also throughout their lifetimes.

This chapter examines the impact of economic disparities on children's beginning experiences with print (see also Britto, Fuligni, & Brooks-Gunn, Chapter 23, this volume). It argues that, in addition to skill delays, differences in socioeconomic circumstances lead to knowledge delays, which, if not addressed in the early years, may lead to a growing knowledge gap. Potentially far more detrimental than achievement score differences, this gap has been shown to relate to social mobility limitations, health and safety problems, anomie, and lack of civic participation (Viswanath & Finnegan, 1996). Consequently, in efforts to prepare children to learn to read, it is crucial to recognize the important role of knowledge in early literacy (Neuman, 2001) and to better balance skill development with conceptual knowledge development. To make this argu-

ment, I first review the concomitants of poverty conditions for children's early literacy development, then describe its implications on increasing knowledge differentials between the "information haves" and the "information have-nots." I end with a set of recommendations for enhancing content knowledge in the early years.

### **The Economic Gap in Cognitive Skills**

America's poor children do not fare well in our society. If you are born poor, you are likely to stay poor. In fact, about 70% of Americans stay in the same social class in which they are born. Children of poorly educated parents make up just 2% of the professional and managerial class (Kahlenberg, 2001). And, more often than not, schools tend to perpetuate the status quo rather than change it. As Juel and colleagues' now-classic study (Juel, Griffith, & Gough, 1986) reports, the probability of a poor reader at the end of grade 1 remaining a poor reader at the end of grade 4 is .88.

Poverty takes no prisoners. When families suffer unemployment, especially in the long term, children's cognitive development tends to suffer (Corcoran & Chaudry, 1997). Disadvantaged children have more hearing problems, ear infections, dental problems, lead exposure, poor nutrition, asthma, and

poor housing (Rothstein, 2004). These conditions appear to be far more pernicious for children in the early years of development than in the later adolescent years, shaping children's ability and achievement when cognitive connections are forming (Duncan & Brooks-Gunn, 1997).

Familial processes that may account for poverty taking such a toll on children's cognitive processes have been explained through two major pathways (Foster, 2002). One pathway by which poverty affects children is through its impact on the family's ability to invest in resources related to children's development. Income enables families to purchase lessons, summer camps, stimulating learning materials and activities, and better quality early childhood care. Entwistle and colleagues (Entwistle, Alexander, & Olson, 1997) suggest that these out-of-school experiences are key factors that differentiate low-income from middle-income achievement and that contribute significantly to maintaining, rather than reducing, the achievement gap. A second pathway through which poverty shapes development is that it affects parents' emotional resources, their well-being, and their interactions with children, which in turn are related to child outcomes. McLoyd and her colleagues (McLoyd, 1990), for example, have shown the impact of economic hardship on depression, diminishing parents' abilities to interact and provide warmth and responsive parenting. Taken together, with few material and emotional resources, it is hardly surprising that hundreds of studies (Jencks & Phillips, 1998) have now documented the dramatic, linear, negative relationships between poverty and children's cognitive-developmental outcomes.

These relationships translate into large differences in readiness skills between low-income children and their more middle- to upper-class peers. Before even entering kindergarten, differences in cognitive skills between high-status and low-status children, according to a large-scale study of entering kindergartners (Lee & Burkam, 2002) is, on average, 60%. Other studies (Denton, West, & Waltston, 2003; Vellutino et al., 1996), as well, have documented large differences in children's receptive and expressive language skills; in children's ability to identify beginning sounds and letters, colors, and numbers; and in the number of words they have

been exposed to prior to entering kindergarten (Hart & Risley, 2003; see Table 2.1).

But perhaps even more serious than skill deficiencies are knowledge deficiencies that arise for children who have limited access to the informal informational lessons that can be transmitted through day-to-day interactions. Although a significant amount of research has focused on differences in early language learning (McCardle & Chhabra, 2004), in vocabulary, and phonemic awareness and how they might be acquired, there has been relatively little discussion of differences among children in content knowledge and its relationship to achievement. However, as much of the early childhood community has recognized (Bredenkamp & Copple, 1997; Neuman, Copple, & Bredenkamp, 2000), skill development apart from meaningful content has limited usefulness or staying power for the young child. Further, indications are that limited content knowledge might ultimately account for what appear to be comprehension difficulties (Vellutino et al., 1996) or higher order thinking difficulties in older children. Therefore, if children's developing conceptual knowledge becomes subordinated to a focus on the relatively small number of necessary procedural skills early on, then the gap between socioeconomic status groups may widen with each

**TABLE 2.1. Beginning Kindergarten Students' School Readiness Skills by Socioeconomic Status**

	Lowest SES	Highest SES
Recognizing letters of alphabet	39%	<b>85%</b>
Identifying beginning sounds of words	10%	<b>51%</b>
Identifying primary colors	<b>69%</b>	90%
Counting to 20	<b>48%</b>	<b>68%</b>
Writing own name	<b>54%</b>	<b>76%</b>
Amount of time read to prior to kindergarten"	25 hours	1,000 hours
Accumulated experience with words <sup>b</sup>	13 million words	<b>45</b> million words

Note. Adapted from Lee and Burkham (2002). Copyright 2002 by Economic Policy Institute. Adapted by permission. <sup>a</sup>Adams (1990).

<sup>b</sup>Hart and Risley (1995).

successive grade level, building to insurmountable gaps after just a few years of schooling.

### **The Knowledge Gap and Its Beginnings**

The knowledge gap is rooted in the two pathways (Corcoran & Chaudry, 1997) described previously that separate children from poverty and their middle- and upper-income peers. The first is material resources (Duncan & Brooks-Gunn, 1997). Poor families, unlike their more middle-class counterparts, are likely to lack resources associated with knowledge acquisition. The prime resources for learning are books and reading materials such as newspapers and magazines. Studies (Cunningham & Stanovich, 1998; West & Stanovich, 1991) suggest that print is associated with knowledge acquisition, greater variety of vocabulary, and abstract reasoning. Yet poor communities, despite their eagerness for print resources, often lack the disposable income to afford them (Neuman, Celano, Greco, & Shue, 2001). Further, print resources tend to be scarce in poor communities. Our analysis of four neighborhoods (Neuman & Celano, 2001), for example, provided a striking example of the differences in resources for low- and middle-income families. Examining four neighborhoods, two poor and two middle-income, we found stark and triangulated differences in access to materials between poor and middle-income neighborhoods: Whereas children in the middle-income neighborhoods had multiple opportunities to observe, use, and purchase books (estimated at about 13 titles per individual child), few such occasions were available for low-income children (estimated to be about 1 book for every 300 children). Further, other avenues of access were limited or lacking. School libraries in poor communities were closed and sometimes boarded up, unlike school libraries in middle-income neighborhoods, which were thriving, with approximately 12 books available per child. Public libraries were open only for brief hours in low-income neighborhoods, compared with many open hours in middle-income neighborhoods. Child-care arrangements, including family and group care, also provided limited access to books.

In a national survey of over 300 centers (Neuman et al., 2001), we found on average fewer than one to two books available per child; of those books, the majority were of mediocre or poor quality.

With limited access to print materials and to opportunities for learning, the second pathway is significantly curtailed. This pathway relates to the quality of the home environment (Neuman et al., 1998; Neuman & Gallagher, 1994) and mother-child interactions concerning stimulating activities and learning opportunities. Without opportunities to be read to, children have less experience with new, different, and more sophisticated vocabulary outside of their day-to-day encounters; they are less likely to learn about their world and to hear decontextualized language, the beginnings of abstracting information from print. And, as Stanovich (1980), in his now-classic model of the Matthew effect, posits, differences in these early opportunities become magnified over time so that less-skilled children coming to school have fewer interactions with text than their more skilled peers. Such unrewarding experiences in reading multiply, with the consequences being that children attend less to the comprehensibility of reading, and its purposes and potential usefulness.

As research on social class and parenting styles suggests (Lareau, 1989), patterns of mother-child interaction over print, their use of the reading experience to provide stimulating experiences for children, tend to carry over into other activities as well. In her study of social class and parenting styles, for example, Lareau (2002) reported how middle-class parents appeared to conform to a cultural logic of childrearing, defined as concerted cultivation, that viewed their parenting role as transmitting important skills and information to children. When the children were not attending child care, parents engaged them in numerous age-specific activities, all designed to develop their talents and interests. Given their superior levels of education, middle-class parents could converse easily with other professionals, discuss key terms, and describe their meanings with their child. In contrast, poor families, feeling the pressures of economic shortages and the sheer drudgery of low-level work, had limited energies for interaction. Children participated in few organized activities; given

more free time, they interacted with relatives rather than acquaintances, creating a language barrier and a thicker divide between families and the outside world. Baumrind (1966, 1968), as well as Hart and Risley (1995), provided ample documentation of the different interactional patterns between low-income parents and their young children. Parents tend to be more authoritarian, and offer fewer explanations and more directives. As a result, they tend to talk less, provide less encouragement to explore, and expose children to fewer new words and concepts.

Child-care arrangements, unfortunately, offer only a limited safety net (Dickinson & McCabe, 2003; Dickinson, McCabe, & Clark-Chiarelli, 2004; see also Farran, Aydogan, Kang, & Lipsey, Chapter 19, this volume). Recent studies (Helburn & Bergmann, 2002; Peisner-Feinberg et al., 1999) indicate dramatic variations in quality of child care, with infant and toddler care being particularly poor and underfunded. Although many children are able to take advantage of good-quality early education in Head Start, rarely do poor children—those who need the very highest quality programs—receive the cognitively stimulating content and curriculum they need. Too often, programs for the poor are, unfortunately, poor programs.

Consequently, striking differences in material resources and in the quality of the home environment, as expressed by parents' interactions, their skills, habits, and styles, begin to define what children are taught, and what is modeled and reinforced in these very early years, just when cognitive connections are forming. And these differences are the key to understanding the beginnings of the social stratification of knowledge, which, if not quickly overcome, grows ever larger with each successive year.

### **Schemas: The Building Blocks of Knowledge**

Children's earliest experiences become organized or structured into schemas, defined by Rumelhart (1980) as the "building blocks of cognition." Schemas provide children with the conceptual apparatus for making sense of the world around them by classifying these incoming bits of information into simi-

lar groupings (Duchan, 2004). Stein and Glenn (1979), for example, provide a compelling case for schemas and their usefulness for recalling information about stories. They found that well-read-to children internalized a form of story grammar, which aided in understanding and retelling simple stories. Similarly, schemas have been shown to aid in remembering, recalling, and classifying particular entities into similar groupings (Anderson & Pearson, 1984), building through analogical reasoning a greater repertoire of knowledge.

But what is particularly important in the process of knowledge acquisition is that schemas provide a kind of organizational prosthetic (Constable, 1986) that serves to diminish the information-processing load. Consider, for example, a young child visiting a library for the first time. It is probably a complex and confusing new world. Not only are there new routines to consider but also categories of choices of books, and activities and different locations and roles of individuals. As the child comes to know the routines and the schemas of visiting the library, he or she begins to form a mental representation of certain activities, devoting less mental energy to the structure of the activity than to the content itself. Certain activities, originally confusing, then become understandable, familiar, and easier to access.

By diminishing the information-processing load, children are able to acquire new information more rapidly. Understanding the basic concept of a "library," for example, enables children to quickly make new associations, creating additional schemas that become increasingly differentiated with more knowledge. Children begin to recognize differences in genres and text types and purposes for reading, resulting in greater speed in gathering and remembering information. Knowledge becomes easier to access, producing more knowledge networks. And conversely, limited knowledge increases the difficulty level of accessing new knowledge.

### **Widening Knowledge Gaps**

A vicious cycle begins. Knowledge disparities among social groups grow as a result of these differences in the amount, rate, and speed of gathering information from multiple media and resources. In its original formulation,

Tichenor, Donohue, and Olien (1970), focusing on media consumption, emphasized the **diffusion** of innovation. They hypothesized that "information haves" read more and engage more in higher level conversations, creating greater existing pools of knowledge and using information for fulfilling specific purposes and needs. Greater use enhances speed of information acquisition and developing schemas, which over time is likely to accelerate a knowledge gap between those who have access and those who do not. Therefore, although the "have-nots" gain knowledge, the "haves" gain it faster. And by gaining it faster, they are able to gain more.

The 1965 television debut of *Sesame Street*, designed specifically to narrow knowledge disparities as part of President Lyndon B. Johnson's Great Society initiative, provides an illustrative example of the difficulties of closing the gap. The first- and second-year evaluations (Ball & Bogatz, 1970; Bogatz & Ball, 1971) of the program showed evidence of actually increasing differences, helping those children who were already somewhat prepared for formal reading instruction far more than the less-ready children, who benefited little. As a result of the program, studies (Cook et al., 1975; Goldsen, 1977) found larger gaps in skills by kindergarten between middle- and lower-income children than before.

Communications scholars (Comstock, 1980; Salomon, 1984), however, have argued that television content is on average at the fourth-grade level; studies (Neuman, 1995; Salomon, 1984) show that learning definitely peaks over the elementary years, due largely to the limitations of the medium. But computer technology knows no bounds. And whether or to what extent this technology may further widen knowledge differentials is potentially concerning. For example, our 6-year study (Neuman & Celano, submitted for publication) examining the influence of "leveling the playing field" by providing equal resources and technology to neighborhood public libraries in low- and middle-income communities found that, rather than closing the gap, allocating equal resources to unequal socioeconomic groups actually appeared to exacerbate the knowledge gap. From the very beginning, preschool children in middle-income neighborhoods were carefully mentored by adults who taught them

to use the resources purposefully and who modeled challenging reading for their children; low-income children rarely came with adults and engaged in only short bursts of behaviors. Technology integration in libraries, even after the novelty wore off, only extended the previous patterns, with poor children reading less, and attending less, and middle-income children reading more, and more often. After more than \$20 million dollars was spent to equalize resources, middle-income children were reading approximately three times as much content as poor children.

Taken together, regardless of topic, methodological or theoretical variations, study quality, or other variables and conditions, over 90 studies (Gaziano, 1997) have reported similar demonstrations of the knowledge gap. Studies on topics (Vernon-Feagans, 1996; Viswanath & Finnegan, 1996) as varied as water policy, crime prevention, foreign policy, health, local budget deficits, and alcohol-related problems have shown the persistence of knowledge inequality. Further, these differentials tend to be especially severe for those groups during economic downturns and hard times. Given the rapid growth of socioeconomic divisions in the past two decades, therefore, the knowledge gap deserves our greater focus and attention.

### **Why Have We Overlooked Knowledge in Early Childhood?**

Thomas Kuhn's structural theory of scientific revolutions (Kuhn, 1962) hypothesized that consensus in a particular field of inquiry sometimes halts progress and innovative thinking rather than promotes it. In part, the virtual consensus on the skills necessary to learn how to read, instantiated now in policy (see Roskos & Vukelich, Chapter 22, this volume), may be one reason for the limited attention given to the important role of knowledge in early literacy development. Recent reports (McCardle & Chhabra, 2004), for example, contend that children's future success in becoming skilled readers is dependent on their becoming aware that spoken words are composed of smaller elements of speech, grasping the idea that letters represent these sounds, learning the many system correspondences between sounds and spellings, and acquiring a repertoire of highly fa-

miliar words that can be recognized on sight. Much of the research (National Reading Panel Report, 2000), in fact, substantiates the importance of these components in learning to read.

However, research that underlies this model is based largely in the field of reading disabilities. In an attempt to untangle the critical features of reading, sampling criteria in this literature typically excludes disadvantaged children, or partials them out, using statistical strategies to try to equate one group with another. In so doing, these studies have necessarily focused on the relatively small store of foundational procedural skills to understand how children decode text.

Yet when we partial out disadvantage, we partial out many related explanations for predicting, explaining, and potentially preventing reading difficulties. As the previous sections in this chapter illustrate, environmental factors, including material resources and the quality of the home environment, play a central role in learning to read. These factors contribute to background knowledge and concepts, vocabulary, familiarity with syntactic and semantic sentences, and verbal reasoning abilities. Consequently, by controlling for poverty, researchers have tended to overlook a most critical predictor of skilled reading—the ability to derive meaning from text. Lacking the conceptual apparatus to understand the words that they are reading, children ultimately become word callers and struggling readers. Comprehension problems (Hirsch, 2003) are related to limitations in prior knowledge.

The second reason for not recognizing the importance of knowledge in early childhood could be definitional. Although the terms knowledge, skills, and dispositions are clearly familiar to most early childhood educators, rarely have we attempted to define them. Some colleagues (Hirsch, 1987), for example, describe knowledge as a series of facts considered to be part of the mainstream culture. Others (Glaser, 1984; Neuman, 2001) identify basic conceptual understandings that underlie disciplines of physical and biological science, art, and social systems. Still others (Gardner, 1983; Neuman, 2001) focus on learning processes, such as problem-solving and thinking skills. As a result, there has been a lack of clarity and understanding about the scope and depth of content knowledge in these early years. Recent efforts by

states to develop prekindergarten standards (Neuman & Roskos, in press) may be helpful in developing content guidelines that are appropriate for children in the early childhood years.

And the third reason for overlooking the importance of knowledge in early childhood might be ideological. The field of early childhood still grapples over the balance between learning processes (i.e., thinking skills), how children learn, and content, or what they learn (Eisner & Vallance, 1974). With resistance to the notion of a canon of knowledge (Hirsch, 1987), developmentally appropriate content curriculum in early childhood is still elusive. More often than not, young children, particularly those in high poverty areas, are subjected to intellectually trivial activities, limited in content and only loosely connected between subjects. Too often, there has been an overemphasis on active, hands-on learning without any foundational knowledge base. Seppanen, Godon, and Metzger (1993) found, for example, that early childhood Title I classrooms did not provide any regular experiences in topics of math, language, and science. Minds atrophy under such conditions.

Yet for early education to work toward helping children attain social and economic equality, we must develop pedagogy that is both sensitive to children's development and representative of conceptual knowledge that has sufficient coherence and depth. Recognizing the divide that begins to separate the "information haves" from the "information have-nots" early on, we need to develop learning experiences that work on the edge of children's competencies and understandings. Research has consistently shown the value of early education in helping to equip children with essential skills. But these skills must be used to develop coherent understandings of knowledge and concepts, the very basic foundations for later learning.

### **What Can We Do to Improve the Knowledge Base in Early Childhood?**

Recently I visited several prekindergarten classes specifically targeted for poor children. Throughout the 3-hour visit, I counted 20 minutes of instruction in these classrooms. Rather than instruction, the day was

overtaken by transitions (late arrivals, early dismissals, lunch, bathroom washing, getting ready for outdoor play, getting back from outdoor play, going to and coming back from "specials," cleaning up). Even more troubling, however, was the type of instruction I observed in early literacy and mathematics within those precious 20 minutes. Children were asked to memorize lines of print, to say the alphabet letters and numbers about five times, to spell their names, to spell the names of children who were not there, to read along with the teacher in a highly predictable format, and to chime lines they had surely heard again and again. And throughout these individual exercises, not once was there an effort to engage children's minds through stimulating content learning (Neuman, 2003).

In contrast to this approach, content-centered classrooms (Neuman & Roskos, 1997) involve children in learning about print through literacy in practice. Here, the skills and functions of literacy serve to enhance children's learning with newly developing skills that become meaningful by helping children understand their world. This approach builds on a set of research-based principles about how young children learn and develop schemas necessary to begin building basic knowledge frameworks. Specifically, the principles include:

1. Children's learning benefits through integrated instruction. Effective teachers use integrated learning (Schickedanz, Pergantis, Kanosky, Blaney, & Ottinger, 1997) to organize large amounts of content into meaningful concepts. Some teachers may use the project approach (Katz & Chard, 1989); others may call it thematic teaching. Both approaches help children to build knowledge networks and provide more time and focus for repeated practice of familiar concepts. Further, children learn and apply skills in various contexts, increasing the likelihood of transfer and extending understanding.

Skillful teachers recognize that thematic instruction must have coherence and depth. Cafeteria-style approaches that teach a little of this and a little of that give only spotty attention to content and only limited connections between subjects. Thematic teaching that works helps children understand a topic well, as opposed to skimming and covering many areas.

2. Learning requires children's minds (not just their bodies) to be active. Effective teachers actively engage children in mastering content (Hirsch, 1996), helping them to connect new learning to what they already know and can do. Consequently, they strike a balance in their instructional planning between structure and choice. Sometimes teachers present a concept that is planned and directed to ensure that knowledge is thoroughly understood and not superficially absorbed. At other times, they recognize that children need to explore, manipulate, and use ideas, working in centers of their choosing that have been carefully prepared with teacher guidance. Both are necessary for young children's learning and development.

3. High levels of teacher interaction optimize children's learning. Effective teachers hold great influence in helping children to reach their potential. They assist and guide children's learning (Tharp & Gallimore, 1988), involving them in experiences that are slightly more difficult than what they can master on their own. Teachers carefully scaffold children's learning (Wood & Middleton, 1975), with the level and amount of assistance gradually decreasing as the children are able to perform tasks independently. They encourage children to express their ideas through language and raise questions that enable them to develop more complex ideas and concepts. Effective teachers work on the edge of children's current competence (Bredenkamp & Copple, 1997), providing learning experiences that are challenging but achievable.

These teachers use a wide range of teaching strategies. Modeling and demonstrating provide standards of practice; explicit instruction, questioning, and ongoing feedback help to challenge and expand children's ideas and skills. All of these strategies are interdependent and make possible the "art and science" of effective teaching.

4. Play supports children's learning. Effective teachers recognize that children's exploration and manipulation of objects, make-believe play, and creative games make important contributions to children's literacy development (Neuman & Roskos, 1992, 1993). In play, children express and represent their ideas, learn to interact with others, and practice newly acquired skills and knowledge.

Teachers provide conditions that affect what children choose to play and the materials that will influence how they play. They construct learning and playing environments that involve children in using literacy in practice. At times, teachers take on roles and actively engage children in content-related activities—such as roles associated with a grocery store or a restaurant—that are first imitated, and expanded on and later integrated in children's developing language repertoire. These teachers seek to enhance language and play while leaving children in control of it.

5. Developing competence enhances motivation and self-esteem. Effective teachers recognize that learning experiences and practices that help children to become skillful at learning many things are far more effective than those designed just to be highly motivating. Children thrive in classrooms in which they develop new understandings and are in the company of teachers who combine nurturance and support with high but realistic standards and expectations. Self-esteem

grows when children are challenged and begin to develop a history of achievement through reasonable effort.

In summary, instructional principles that engage children in content-rich contexts integrated across subject domains with high levels of teacher support and guidance and in play to extend learning provide opportunities for all children to achieve while ensuring that individual children will receive the extra support they need to progress. Table 2.2 provides an example of a content-rich thematic unit on the physical world. Throughout these activities, literacy is an integral part of learning through practice.

### A Day's Activity in a Content-Rich Literacy-in-Practice Classroom

Content-rich classrooms are carefully constructed to be sensitive to what children should know and be able to do. But they are also sensitive to children's development and

**TABLE 2.2. Thematic Study on the Physical World**

Unit	Major concepts	Materials needed	Prekindergarten guidelines
Magnetism	Magnetic force attracts things made of iron and steel. Magnets have many uses and help us do many things.	Objects to test and sort Books on magnets	The child: <ul style="list-style-type: none"> <li>• Uses one more sense to observe phenomena.</li> <li>• Analyzes patterns and relationships.</li> </ul>
Colors	There are many different colors, and they have different names. Primary colors are red, yellow, and blue.	Books Paint Colored paper Color swatches Food colors	The child: <ul style="list-style-type: none"> <li>• Uses different colors to create meaning.</li> <li>• Uses new vocabulary in everyday communication.</li> </ul>
Sound	We can identify things by their sounds. Sound is created by vibrations of objects. Sounds can be <b>high/low, loud/soft</b> .	Musical instruments Records Kitchen food containers Chutes and marbles Popcorn cooking	The child: <ul style="list-style-type: none"> <li>• Identifies similarities and differences.</li> <li>• Begins to distinguish among sounds of several instruments.</li> </ul>
Weather, climate, and seasons	Seasonal changes affect plants and animals. Animals store food. People <b>adapt</b> to <b>differences</b> in weather.	Books Logs for observing weather Visit to a greenhouse Picture display of animals in winter	The child: <ul style="list-style-type: none"> <li>• Begins to observe changes in the environment.</li> </ul>



their need to explore new ideas on their own. These environments should be challenging, stimulating for young children, and age-appropriate, as shown in the following example. Table 2.2 provides an overview of the teacher's thematic plan, and the major concepts, materials, and guidelines addressed in her lesson plans.

Children arrive for the day between 8:30 and 8:45 A.M. and are greeted at the door by the teacher. They hang their coats and sweaters in individual cubbyholes, carefully labeled with their names and photos, then check in by finding their names on the attendance chart. Some visit the library corner or the dramatic-play center as they wait for others to arrive.

Around 8:45, the teacher sings a song to indicate that the morning meeting will begin. The children gather around the circle area. After a brief greeting, she describes some of the new choices for the upcoming activity time and gives a brief demonstration of how some piece of equipment or tool may be used. The children show their choices of activity by raising their hands before being dismissed. Because more children want to go into an area than can be accommodated, she shows how they might cooperate so that each child may have a turn.

Activities in the centers have been carefully planned for the day. Because this unit is on sound, in one area children will make popcorn and hear the sounds of sizzling, popping, and corn smacking and will hear when these sounds taper off. In the block area, they will play with chutes and marbles; in the science area they will use resonating bells and voice play to hear different pitches. In the listening center, children will listen to a nature tape and draw pictures of what they hear. And in the manipulative area, the teacher will play rhyming word-picture match with a small group of children whom she has discovered need special assistance with this phonological skill.

Once cleanup is over, children gather for group time. They have much to share about their activities. They review the sounds they have heard and talk about how sounds are made, writing the words, along with a picture, on a chart that will be used throughout the unit. Then the teacher introduces some songs with distinctive rhythms and sounds, such as "Oats, Peas, Beans, and Barley Grow,"

and the children take turns clapping out a rhythm. The teacher introduces a slightly more difficult variation and encourages the children to follow her lead. They then sing "Willoughby Walloby Woo" to help sensitize them to similar sounds at the beginning of words. And in the last few minutes, they play the game, "What begins with. . . ." This leads to a smooth transition to snack time. She slowly says the names of two children who will help to put out the snacks, emphasizing the beginning sound. The teacher holds up a menu of today's snack of five graham crackers and one cup of juice, printed along with the pictures.

Today's outdoor activity is an environmental sound walk on which children learn to identify objects and actions by their sounds—the sounds of animals, of the wind, of other children on the playground. Upon returning to classroom, children recall some of the sounds they heard, which are written down on a chart. They gather for story time. The teacher reads first from one of her favorite anthologies of poetry and rhyme and then reads the delightful story about tolerance and sound, *Charlene Loves to Make Noise*, by Barbara Bottner and Alexander Stadler (2002), following each with a short discussion. Tomorrow she will review the different sounds they heard today and help the children categorize loud and soft sounds. Children are then dismissed for the day.

### *Taking a Closer Look*

Children's activities were well paced throughout the day to provide sufficient variation and challenge. The schedule allowed for teacher-directed instruction (group time and story time) and for child choice. During activity times, children were given considerable opportunity to choose their activities, although the teacher had provided guidance and direction through the materials she had organized and the interactions that occurred throughout activity time. Arrival time and dismissal were relatively short to allow more time for in-depth learning.

Children were very active throughout the day, both mentally and physically. The activities all focused on the science of sound. Group time and activities were designed to extend their understandings through varied experiments, stories and poems, and learning

experiences, which engaged children in manipulating materials and social interactions. All activities emphasized language.

The topic of sound was substantive. It was broad and varied enough to address a number of science guidelines (i.e., both content and process), as well as oral language, print awareness, and phonological awareness. In subsequent days, as they progressed through the unit, children were involved in opportunities to learn more about sound through listening, fine arts activities, and writing.

This example highlights some essential features of an effective content-rich literacy-in-practice day. It ensured that children were exposed to:

- Time, materials, and resources to actively build linguistic and conceptual knowledge in a rich domain.
- A literate environment in which children have access to a wide variety of reading and writing materials.
- Different grouping patterns (large, small, individual) and different levels of guidance (i.e., explicit instruction, assisted instruction) to meet the needs of individual children.
- Opportunities for sustained and in-depth learning.
- A "masterful" orchestration of pacing and management (i.e., activity, behavior, and resources).

Classrooms such as these help children build schemas, serving to enhance foundational knowledge in core subject areas. Teachers use explicit instruction—modeling, telling, showing, explaining, and demonstrating information—that children with limited prior knowledge receive the same kinds of opportunities that other middle-class children have had. This knowledge, then, acts as a catalyst for children to acquire more knowledge on their own. In these content-rich settings, early literacy skills ultimately serve, not supersede, children's developing thirst for knowledge and greater understanding.

## Conclusions

No nation has entirely overcome the highly predictable relationship between low aca-

demically performance and socioeconomic status. As this review has established, key material resources and interpersonal experiences that are common in higher income homes are not available and are unlikely to be available for children in poverty settings. And it is these key experiences that children from low-income communities lack—vital background knowledge for developing concepts and schemas—not their ability to learn that puts these children at a great disadvantage, especially when learning to read increasingly builds on prior knowledge when reading to learn. Because the important role of knowledge in the beginning years has been overlooked, early literacy has become associated with a rather small set of skills. Yet, if time is to be spent effectively in the early years, content knowledge essential to higher order skills must not be subordinated to these foundational skills.

Both skill development and conceptual knowledge development need to occur simultaneously. At-risk children cannot afford to attend to one without the other. Although it is probably impossible to close the gap, it can be significantly reduced with high-quality instruction in the early years that integrates knowledge and dispositions for learning with skills. Unless these early knowledge deficits are quickly overcome, the knowledge gap will continue to grow ever wider with each successive grade level.

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