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Home to School: Numeracy Practices and Mathematical Identities

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Drawing on a perspective of mathematics as situated social practice, we focus on 4 children in an urban preschool classroom and follow those children between home and school sites to shed light on urban children's persistent underachievement in mathematics. In this article, we describe the ways in which numeracy practices travel with children between home and school and, within those contexts, shape complex and sometimes limited social identities for children. We found that school imperatives, such as assessments and socialization curricula, often obscure teachers' views of children's mathematical practices. Deficit assumptions about family and community support for children, and limited interaction between caregivers and teachers, further contribute to the tendency of school personnel to overlook the mathematical practices that children bring with them to school. We further suggest that vignettes drawn from ethnographic-type research such as this have potential for professional development for classroom teachers.

School reformers concerned with persistent patterns of underachievement among students attending urban public schools have focused on issues of school conditions, including resources, curriculum, governance, and teacher preparation. When social influences outside school are mentioned, they are usually limited to factors such as whether the child comes from a single-parent family, the socioeconomic

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status of the family, the mother's age and/or level of education, and other attributes that might be expected to have negative effects on learning.

We believe, however, that these lines of thinking miss an entire range of potentially positive social influences that may come from a child's home experiences. Too often, teachers and schools fail to recognize or credit the knowledge, skills, and strategies that children bring with them from home—especially when a child comes from a family background that differs from that of the teacher's in social class, race, or ethnicity.

In this article, we discuss one such potentially constructive social influence—the ways in which numeracy activities and thinking are embedded in the social activities of children's homes and communities, as well as in the classroom. In this study, we draw on the broader field of research that considers learning as situated social practice (Lave, 1992; Lave & Wenger, 1991; Walkerdine, 1988) and on recent studies that look at the ways in which numeracy and mathematical thinking are embedded in the social life of the home and community, as well as in classrooms (Lerman, 2000). We present vignettes of four children engaged in social activity where numeracy is central. We discuss the vignettes through the lens of situated social practice and use Bourdieu's concept of *habitus* to explore mathematics learning and knowing as social capital or cultural resources (Baker, Street, & Tomlin, 2002). As Lerman also explained, the field of mathematics education has turned to social learning theory because "it [mathematics] appears all around when one chooses to apply a mathematical gaze" (p. 21). Mathematical activity is an inescapable part of everyday life for members of all racial, ethnic, and socioeconomic groups. Drawing on this mathematics-as-social stance, we look at what happens in the classroom to these cultural resources that travel between home and school and find consequences for children's emerging identities as mathematical learners.

We argue that children do not forget their at-home numeracy experiences when they enter the schoolhouse door; rather, that numeracy practices "travel" back and forth between home and school. Children bring their mathematical orientations, beliefs, social constructs, and knowledge with them into the classroom. We have found, however, that the imperatives that teachers face (e.g., meeting assessment standards and socializing children into school behaviors), as well as teachers' expectations about essential sequences for learning, often overshadow the mathematical knowledge and practices that children bring with them to school. Furthermore, assumptions about the lack of support for learning in low-income communities contribute to the tendency of school personnel to overlook the mathematical practices that children bring with them. Children, for their part, sometimes discern, and sometimes do not recognize, the connection between their out-of-school mathematical practices and the kinds of mathematical problems they are asked to solve in school (e.g., see Baker et al., 2002). Nonetheless, mathematical practices do travel among the sites in which children live and learn, and the sociocultural aspects of mathematics that are discontinuous between homes and schools may partially ex-

plain mathematics underachievement (Guberman, 2002; Gutstein, Lipman, Hernandez, & de los Reyes, 1997).

The findings of our study suggest that an expanded focus on the links between children's numeracy experiences in and out of school has the potential to benefit the mathematics achievement of urban students. Teachers gain new pedagogical resources when they understand more about the mathematical/numeric practices, and family support, that children bring to school. With this insight, teachers can better understand the overlap and divergence in the ways children are engaging with mathematical activity in the multiple contexts of home, community, and school. This insight offers the potential to help teachers build links between out-of-school practices and the kind of mathematics necessary for school success. Parents and other caregivers, with their knowledge of children's use of numeracy in out-of-school contexts, can become a source of information and insight for teachers. A pedagogical stance that includes a wider lens for legitimate mathematical activity, and that gives credibility to children's sociocultural practices, makes visible the importance of a more active and collaborative relationship between teacher and parent.

THEORETICAL FRAMEWORK

Our research approach borrowed from New Literacy Studies (NLS), which promote a sociocultural view of literacy within the broader social contexts that give meaning to reading, writing, and oral communication (Gee, 1996; Gregory & Williams, 2000; Heath, 1983; Street, 1997). NLS recognize the situated practice aspects of literacy, where reading, writing, and speaking are nested, or contextualized, in local and ever-widening discourse communities. NLS recognize the continuities, rather than simple dichotomies, between oral and written literacies, informal and formal learning, home and school spheres, cultural and cognitive knowledge, and social and academic discourses. Researchers have begun to apply some of the core ideas and formulations of NLS to numeracy (Boaler, 2000; Boaler & Greeno, 2000; Lerman, 2000; Street, Baker, & Tomlin, 2001) to explore possible theoretical applications.

A sociocultural view of literacy or numeracy draws on a view of learning as cultural practice or "habitus," in which Bourdieu (1999) and others (Pahl, 2002) theorized that persons acquire knowledge and skills in culturally inscribed settings. As such, cultural knowledge, or resources, will vary across settings, as will modes of learning, such as the content and degree of implicit and explicit learning. In this view, knowledge, context, culture, and socialization are regarded as interactive. In this pilot study, we looked to the complex transfer, or travel, of knowledge across contexts.

The travel of knowledge across domains and sites has been characterized, with a variety of emphases, as transfer (Cormier & Hagman, 1987), syncretization (Gregory & Williams, 2000), translation (Cook-Sather, 2001), harnessing (Lerman, 2000), and code-switching (Baker et al., 2002). As "products of social activity" (Lerman, 2000, p. 23), mathematical knowledge for young children is gained in the home and community, as well as the classroom. Mathematical knowledge gained in the home and community has the potential to serve as a fund of knowledge in the classroom (Moll, Amanti, Neff, & Gonzalez, 1992).

Therefore, we assume that numeracy, like literacy, is gained in daily social activity and that it travels between home and school sites. How the travel of mathematical knowledge is characterized and understood in the contexts of the home and classroom informs teachers' and parents' perceptions of students. We suggest that an accurate and rich understanding of children's mathematical habitus is critical for educators in arranging for culturally relevant mathematical instruction. The use of habitus as a theoretical lens can help educators to interpret the instruction they enact in the classroom as well as how the children practice mathematics within the context of instruction.

Knowledge and its practice are also constitutive of identities. One becomes an athlete, musician, reader, writer, or mathematician through participatory practice, as well as learning skills and knowledge. According to Lave and Wenger (1991), "learning and a sense of identity are inseparable: they are aspects of the same phenomenon" (p. 15). A view of learning that accounts for socioculturally constructed identity recognizes that the meanings of learning go far beyond discreet skills and facts. Although the terms *personhood* (Egan-Robertson, 1998) and *subjectivity* (McCarthey, 1998) have also been used in literacy research to account for positions and relationships that are constituted through situated practice, we have chosen the term *social identity* because it foregrounds the sociocultural aspects of identity formation. In respect to mathematics and identity, "students do not just learn mathematics in classrooms, they learn to *be*, and many students develop identities that give negative value to the passive reception of abstract knowledge" (Boaler & Greeno, 2000, p. 188). In advocating for active and critical mathematics curriculum, Boaler and Greeno suggested that identities of agency, developed in participatory classrooms where students generate questions, discuss problems, evaluate validity, and "contribute *more* of their selves" (p. 189), may be crucial to mathematics success.

In classrooms and communities, children engage in legitimate literate and mathematical activities, but they may or may not concurrently construct equally powerful identities as readers, writers, or mathematicians. Cultural and social factors, including positions as socially classed, raced, gendered, and ethnic persons, are implicated in their identity formation as well as instruction and practice. In addition, what counts or is perceived as literate or mathematical knowledge may have a profound effect on children's classroom experience and forming identities. Yagelski (2000) argued that it is through local acts of literacy practice, within and

outside of schools, that students construct identities. He suggested that students' identity formation is "always, to some extent, a negotiation among the roles available to them, within the discourses in place in particular situations and the self-interest they bring to specific rhetorical tasks" (p. 136). We assume that this is true of numeracy practices as well.

In drawing on the knowledge and identity concepts that predominate in NLS, we confront the fundamental questions of what and whose knowledge counts in classrooms. It may be easier to see school mathematics when it enters the home because it often travels more explicitly on a homework assignment or a worksheet or a test. As teachers, and researchers, how do we know mathematical knowledge when it comes to school from the home? We struggled with this as researchers and drew on readings in mathematics (Ginsberg, 1982; Kamii & DeClark, 1985) and mathematics consultants (David Baker, University of Brighton, England; Peter Appelbaum, Arcadia University, Glenside, Pennsylvania) to open and focus our lens.

NLS, views of learning as social practice or habitus, and learning as constitutive of social identities has widened our view beyond the cognitive–psychological and technical views of learning that have predominated in both literacy and mathematics research. NLS have opened up language learning to new literacies of computers and media (Lankshear & Knobel, 2003) and multiliteracies of critical analysis and social change (New London Group, 1996). We have used this pilot study to open our mathematical lens to new numeracies (computers) and old but still active numeracies, such as puzzles and counting in *Chutes and Ladders*™ (essentially the same game known elsewhere as *Snakes and Ladders*), to capture a broad range of numerical knowledge and what it means to children to use those funds of knowledge in classrooms.

In framing this study through a sociocultural lens, including attention to identity formation and what has been learned in NLS, we chose to look deeply rather than broadly to see the intersection of home and school knowledge. We focus this ethnographic-type numeracy study on four particular Head Start children because we agree with Yagelski (2000) that there is much to be learned from the local and the particular. Our specific choices and methods are described in the next section.

RESEARCH SITE AND METHODOLOGY

One African American and two White researchers worked as a team throughout this study, benefiting from the different perspectives each brought to bear on the data. At various points along the way, our analysis was informed by opportunities to share our findings with others, including professors who teach math education at the university level, teachers in the focal school, and teachers and central office staff in the Philadelphia School District.

As we noted earlier, the academic underachievement of low-income urban students is persistent nationwide. Despite progress in improving test results on the

Pennsylvania State Student Assessments, Philadelphia students still reflect this national pattern. In 2003, approximately 56% of Philadelphia fifth and eighth graders and 65% of 11th graders tested below basic level in mathematics (*Philadelphia Inquirer*, March 7, 2004, "Report Card on the Schools"). In 2001, in response to statistics such as these, the state assumed control of the Philadelphia schools, which are 65% African American, declaring the system in an academic, as well as a fiscal, crisis.

Therefore, we chose an elementary school in Philadelphia, located in a low-income working class African American neighborhood, in which to conduct this study. The area surrounding the school showed the signs of the economic deterioration of the neighborhood; the street in front of the school was often trash-strewn, and many nearby buildings were boarded up. The school counselor told us that she used to make home visits, but she no longer did so because of the increasing violence in the area. Nonetheless, she believed that a strength of the community is that children have "pretty good support systems" and that "parents were more proactive now [about their children's education] than before." She noted that parents encourage their children to watch educational TV programs, and they buy their children educational toys, such as calculators and clocks, as well as computers.

We selected a school that met the following criteria: a principal interested in participating in the research; a faculty willing to address mathematics teaching and learning and open and curious about what might be learned by looking at mathematics in the home as well as in classroom; a school with a feeder Head Start program, so we could begin with children still close to their at-home experience; and a school where children were underachieving in mathematics, as measured by state assessments.

In observing activities that involved numeracy in either the classroom or home, we were guided by the following questions: Who are the participants? What is the broad social context for the activity? What are the purposes of the activity from the perspectives of the different participants? How do home and school numeracy practices interact across settings to constitute social identities? These broad questions allowed us to see learning as situated and peopled, rather than as a simple teacher-to-student dyad. These questions guided our interviews and document collection in terms of breadth of informants (teachers, parents and caregivers, counselor, principal) and sources of information. We used interviews to uncover beliefs about general mathematics knowledge, learning, and understandings specific to home and classroom activities.

Our primary focus was on what Cole (1996) described as the child-in-activity. We observed children in the course of their everyday lives in and out of school and talked with the child about his or her engagement in social activities, as well as with adults who interacted with the child. Because we were interested in social activity, we employed qualitative methods, observing and conducting interviews—with parents and grandparents, teachers, principal, school counselors, and other school leaders—to gather multiple perspectives on what we were observing. We

also reviewed archival documents, including the School District of Philadelphia School Profile and school and classroom newsletters sent home to families. These confirmed the district's struggle and focus on assessment and underachievement.

In consultation with the lead Head Start teacher, we selected 4 children (from a class of 18) as participants for case studies. We asked the teacher to suggest children who, in her mind, represented an academic and a social range. By focusing on 4 children, we were able to track numeracy practices across particular homes and the school.

The most intensive classroom data collection lasted for 13 months, from January 2002 through February 2003, with follow-up visits to children in their new classrooms during the spring of 2003. The focal children were observed for a total of 14 times in the classroom, for 1½ to 3 hr each time. A typical day in the classroom included breakfast, lunch, and snack; quiet independent activities (such as puzzles, games, and books); personal hygiene (teeth brushing, hand-washing, toilet); clean-up activities; rest time; circle time (a gathering of students for calendar and weather, story of the day, books on tape, music and movement, closing activities); literacy exploration (The 100 Book Challenge); and gross motor development (recess outside or classroom activity).

During this observation period, we began after-school home visits that lasted 2 to 3 hr each. Visits were made to the homes and neighborhoods of three of the case study students, and in the case of two students, several home visits were made. Visits were supplemented by telephone conversations and in-person conversations with caregivers at school. During the home visits, we interviewed caregivers for about 30 min. We observed the children in "home"—home being a variety of contexts in which the children spent their after-school hours, including their parents' home, their father's workplace, a grandparents' home, or a classroom where a grandmother was an aide—and activities such as going to the store and playing on the block. We were able to conduct follow-up visits with two of the four families after the formal data collection and when the children moved on to the next grade. In addition, we were present as participant observers at the Head Start parent–teacher conferences during the study.

Although we had frequent informal conversations with the lead teacher and her assistant in the classroom, we also formally interviewed them for 1½ hr. The lead teacher, Ms. A, was White, she lived outside the community, and this was her third year of teaching but her first year teaching in a Head Start classroom. The assistant teacher, Ms. B, was an African American woman who lived in the community and had been a volunteer Head Start parent when her children were young. This was her first year in this position. We also formally interviewed the Small Learning Community Coordinator for Head Start through Grade 1, the school counselor, and the principal.

In interviewing the teachers (4/24/02), our primary interest was to ascertain teacher beliefs about mathematics learning among young children and to learn about the curriculum in the Head Start classroom. When asked a question, the lead

teacher invariably answered first, whereas the assistant would add to her response. Although Ms. A articulated numeracy skills that we expected to hear, such as numbers, counting, shapes, and time, Ms. B often added skills and items to Ms. A's list that came from home, volunteering, "I think about money, students come with money, they come in and ask how much is this worth." Ms. A frequently referred to the Core Assessments, saying, "I'm also thinking about things we have to assess them on with the Core Assessments." When the researchers asked whether there was anything they could look for in their observations that would be a "resource" to the teachers, Ms. A stated, "the different areas of the Core Assessment that I may have trouble noticing." Although the teachers, when interviewed together, rarely disagreed, they had different views on the presence of mathematics in music. The researcher asked, "I've noticed … you'll turn on the music and it's directional-type of songs like the Hokey-Pokey (and) the Bunny Hop. That's sequencing and patterns. What do you think about that?" Ms. A responded, "I don't think about it as math. I think about it as gross motor development or following/imitating movement to a beat. I think of it as a little different." Ms. B responded, "There is a tape where you have to clap to the beat and they start off with three and you have to listen because the beat is three or two."

The teachers had beliefs about where children's math competence came from. Ms. A stated that the children's in-class math competence depended on their level of development, how much help they got at home, whether they had older siblings, and their length of time in school. She stated that for two highly competent children, it was "different because I don't think they get it from home. I think they have a lot of common sense basically. They pick up on things very quickly." Ms. B added that another child "may learn from his peers and he can pick it up, too." Although Ms. A stated that the curriculum is more informal than formal (daily review of the calendar with children and attendance-taking that involves the children), she said she taught more formally as the Core Assessments got closer.

We created vignettes from our data to illuminate the phenomena of children engaged in social activity. The data we selected for these vignettes, in our judgment, shows "numeracy in practice." Our vignettes were meant to capture "numeracy events," defined as those "occasions in which a numeracy activity is integral to the nature of the participants' interactions and their interpretative processes" (Baker, 1996, as cited in Baker et al., 2002, p. 12). The notion of a numeracy event again borrows from work done in the field of literacy, where a "literacy event" has been conceptualized as a social event in which reading, writing, and/or oral communication are central to the activity and where the cultural context gives meaning to the literacy activity (Heath, 1983).

In the remainder of this article, we present vignettes based on data from the four focal children, followed by discussion. Although school numeracy (and literacy) activities were observed in the home (workbooks, school reading, math flashcards, reinforcement of counting skills, and Tammy's grandmother brought computer

learning games to and from the school and coached her in reading using phonics), we focus in this article on the movement of numeracy activities from the home into the classroom. We theorize how cultural resources (Moll et al., 1992) and conceptions of social identities (Jenkins, 1996; Lave & Wenger, 1991) can explain how children carry practices from setting to setting and what those practices mean in different contexts. We conclude the article with implications that we have made from this study for professional development, classroom pedagogy, and further research.

VIGNETTES OF THE TRAVEL OF HOME AND SCHOOL NUMERACY PRACTICES: MEET ANNA, TAMMY, DANNY, AND RONNY

The first two vignettes are of Anna and Tammy (names of all children and teachers are pseudonyms). The Anna vignette shows how a teacher can value a classroom material, such as puzzles, as important to mathematical development and yet miss the mathematical potential of the child's use of the material. The vignette of Tammy introduces the ways in which the reinforcement of skills to be assessed in the core curriculum can overshadow the meaning that a numeracy activity has for the child. In this case, we see how the focus on the skills to be assessed can lead the teacher to overlook what the child is doing mathematically in favor of an opportunity to reinforce the prescribed curriculum. Nonetheless, we also see in these cases that the teacher is aware of Anna's interest in puzzles and Tammy's mathematical abilities and that these can lead her to think positively about their academic development.

The third vignette, of Danny, fleshes out the socially situated nature of mathematical activity and its travel across settings. This vignette poignantly demonstrates the negative consequences that a "school" view of the child can have for his emergent identity as a learner. The last vignette, of Ronny, echoes the dangers to the child of such a limited view.

Anna

Anna was a small, wiry, wide-eyed 3-year-old who most often could be found working on puzzles. She was among the youngest children in the class. On the day of this observation, other children drifted away from the puzzle area during their 45-min free choice time, and she was left working alone.

Anna picked a flag puzzle to work on that she had worked on earlier in the day with an older student. The puzzle has about 10 pieces, several of them interior pieces. I could see from how she was working that she relied on the edges of the pieces to figure out the puzzle, ignoring shape, color, and pattern cues. She worked

steadfastly, trying to match edge to edge, staying with this approach an extraordinarily long time and finally succeeding in fitting all the pieces together. She repeated working on the puzzle several times, still using the strategy of matching edges. As she became more familiar with the puzzle, she put it together faster, presumably using other clues of shape, color, and pattern. I noticed that when she started other puzzles, she proceeded to solve them in much the same way.

The next time I visited the class, I had an opportunity to talk with Anna's father. I commented about Anna's persistence with puzzles and her reliance on matching edges to solve them. Anna's teacher overheard my conversation and remarked that "she [Anna] is always choosing puzzles." Anna's father was not surprised by what either of us tells him and explained that Anna and her siblings play with puzzles at home and that they have a lot of them. He added that their mother always had a 500-piece puzzle going and that "they learned to start with the outer edges from their mother."

Tammy

Tammy was 5 years old and would enter kindergarten next year. Both her grandmother and her father worked as aides in her elementary school. Her teachers believed that she was strong academically and socially and encouraged her parents and grandparents to foster her independence. The following observation is one that we made during "calendar time," a 45-min formal instructional period.

Ms. A, the teacher, first asked the children to identify the date (several knew it was February 12) and then to count the days from the first day of the month ending with the 12th. On the calendar, there was a heart marking Valentine's Day on February 14th. Tammy raised her hand and reported when called on that Easter "comes up" after Valentine's Day and described her new Easter bunny costume. Ms. A responded, "I like that, it tells Easter is after Valentine's Day." When Tammy raised her hand again and offered that "there are two more days until Valentine's day," Ms. A continued pointing out that today is before Valentine's Day and Valentine's Day is after today.

One day after school, I walked with Tammy and her father from school to his barbershop, also in the neighborhood. Along the way, he quizzed her to keep her entertained. For instance, he asked, "How many more blocks till we get the shop?" and "What color is the car in front of the shop?"

Discussion of Anna and Tammy

The teacher had observed that Anna gravitated toward the puzzle area, but in our conversations with the teacher, she never provided an explanation for this. When we asked Ms. A about materials in the classroom that she believed were connected to learning mathematics, she included puzzles on her list, saying that she thought

they were good "for learning problem-solving." Nonetheless, she was unaware of Anna's use of edges as an initial problem-solving strategy and of Anna's at-home resources that contributed to the development of this strategy and its predominance when solving a puzzle. Although it appeared to the researcher that Anna ignored cues other than the edges, it is possible that she made a choice based on the puzzle at hand. In the months that we observed the classroom, we did not see the teacher engage Anna in building a repertoire of strategies to solve problems of spatial relationship such as those that occur in puzzles.

School texts and workbooks circulate in Tammy's family. Instructional behaviors, such as "quizzing," travel from school to home and back again through her grandmother and father, both of whom worked as classroom aides at the school. Tammy, who has been in preschool since she was 11 months old, was well acquainted with the kind of calendar instruction her teacher was engaging in. Of interest, she appeared to go beyond the teacher's routine questions and was transposing her at-home experience with "how many" questions onto the calendar instructional time. The teacher, however, said she was focused on using Tammy's comments to convey the concepts of before and after, which are part of the Head Start Core Assessment, and either she did not see or chose not to pick up on the mathematical import of Tammy's comment. Nonetheless, the teacher told us in an interview that "I [have] noticed that Tammy can probably add. She does early addition skills. You can say to her, 'how many do I have all together,' and she would be able to tell you."

Danny

Danny was a bright-eyed 3-year-old in his first year of Head Start. He had dramatic and changeable moods: He was sometimes energetic and engaged and other times despondent and holding back, in need of comforting. When his teachers were asked to assess him academically and socially, they responded that he was "in the middle range." The vignette about Danny describes three numeracy events that took place one morning in Danny's class: Danny playing the game *Chutes and Ladders*™ (see Figure 1) with one researcher and then with the teacher, and Danny responding to the teacher's request to count the students and adults in the classroom (a day of extremely low attendance). These three events occurred in close proximity, and each sheds light on the others.

Danny was sitting at the small game table when we entered the classroom. I went over to the table and sat, and Danny asked me to play *Chutes and Ladders*™. Danny got the game and set it up, instructing me on where I should place my marker to start the game. He went first, taking the dial and spinning it, landing on the number 5. Conscious that the children were quite young, I was surprised that the game had progressed this far. Children, in playing with one another in the classroom, rarely got beyond setting up the board and pieces, seeming primarily en-

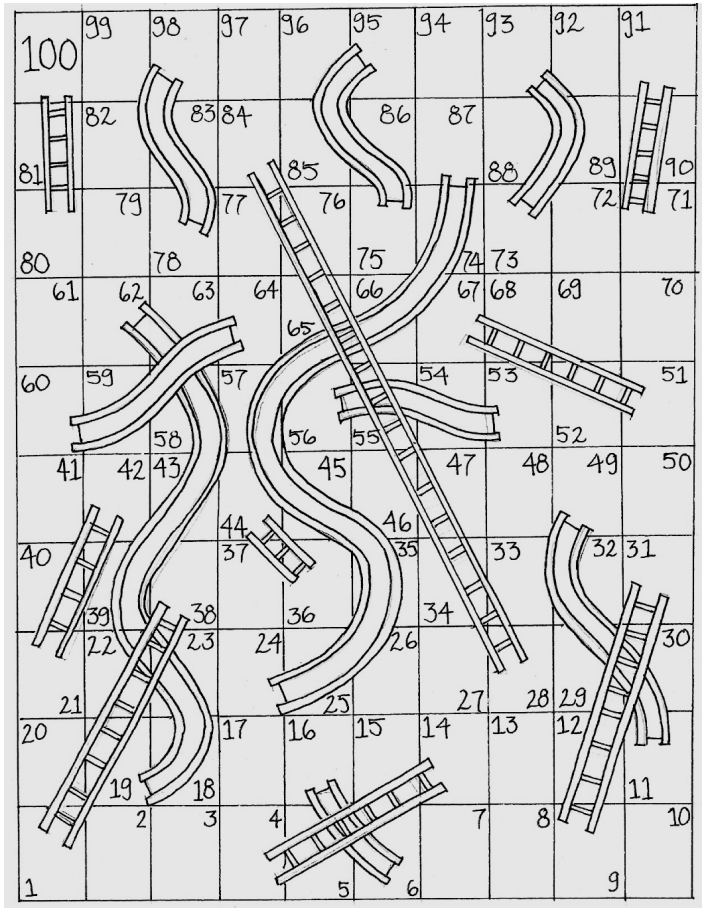

FIGURE 1 An example of the game board for *Chutes and Ladders*™.

gaged by game boards, pieces, and moving them around arbitrarily. As we began to play, the teacher walked past and commented to me that Danny liked to win, that he would "cheat."

When he moved his marker, he double counted on the first and second spaces, landing on the third space, which has a ladder, so that he advanced. I took my turn, spinning and moving in accordance with the number I landed on the spinner. As the game progressed, Danny continued to be able to identify the numerals on the spinner and moved his marker to land on ladders and avoid chutes, double-counting when necessary.

When Danny was sufficiently ahead of me, and there was no chute nearby, he moved in a one-to-one correspondence with the number he spun. As the game pro-

gressed and Danny was winning, he stood in front of his seat, dancing a little jig of excitement after each of his moves. He also asked me questions, indicating that he was curious about whether I was familiar with the game. In less than 8 min, the game was over, and Danny had won. I was amazed, given he was 3, that he could roughly follow the rules and adjust them to his advantage.

The teacher came by and asked Danny how many children were in the classroom that day. He walked around and touched each child and counts to three. Then she asked him how many grownups. He went around and counted five, and she asked him to go try again, and this time, touching each as he counted, he counted four. Then she asked how many children and adults. He touched each child and adult as he counted to seven, touching himself last.

The teacher gave him a high five for his good work, mentioning especially that he did not forget to count himself. He then asked her to play *Chutes and Ladders*™. Instead of the game spinner, he wanted to use a play clock for the spinner, saying it would be "new." The teacher warned Danny, "I won't let you be a 'cheater.'"

Nonetheless, he began by double-counting in a manner similar to that when he played with me, trying to ensure that he ended up on a ladder, but the teacher stopped him and insisted that he count the spaces in one-to-one correspondence with the number he landed on the clock. Throughout the time that they played, the teacher monitored him, placing the emphasis on playing the game according to the rules. After about 10 min, neither had progressed very far, having landed on chutes a number of times, and it was time to clean up and go outdoors. This time, Danny did not do any jigs.

Discussion of Danny

We describe Danny playing the game *Chutes and Ladders*™ in two different social contexts, although both occur in his classroom. First, he was playing with the researcher, who allowed the game to be child-directed and was not concerned with whether Danny followed the formal rules. Danny showed confidence and familiarity with *Chutes and Ladders*™, setting up the game and instructing her about where to put her piece to play. Danny's objective in playing the game was to win, made obvious by his jig of delight after each of his moves that put him ahead in the game. When playing with the researcher, Danny employed strategies that he had developed for winning, which included manipulating his counting to land on symbols (ladders) that advanced him and avoid symbols (chutes) that might set him back and cause him to lose. Watching him "count" made it clear that he was not following a random process but was able to predict how many times he must double-count to either land on a ladder or avoid a chute. It was also clear that he could count in a one-to-one correspondence to the number he spins, as he did that when he was well in advance of the researcher and in no danger of landing on a chute.

It is clear that Danny knew the correspondence between numerals and counting, from the way in which he counted when he was ahead of the researcher and winning the game, his ability to count the children and adults in the class, employing the touch-and-count method familiar to him from counting moves on the game board, and from the coresearcher's interview with his grandmother. Danny's grandmother told us, "Danny counts, he will count everything. Legos® [plastic blocks] is his favorite, but he has 'football men' and he uses the carpets as the 'field.' He sets it up and counts the men." In fact, it appears that Danny can count well beyond the value of the 1 to 12 numerals that are on either the spinner or the clock that he used the second time he played the game.

When Danny played *Chutes and Ladders*™ with his teacher, she directed the play. The teacher's purpose for playing the game differed from Danny's; although he would have liked to play to win, she played to reinforce the value of following rules (i.e., not being a "cheater") and practicing skills such as counting. For her, the game was an academic and behavioral instructional tool. She introduced the imperative of the preschool classroom to socialize children not to "be a cheater." Danny's mathematical capacities in the playing of *Chutes and Ladders*™ with the teacher were effectively invisible at best and negated at worst.

Danny's home had games, and his grandmother described his particular fondness for *Chutes and Ladders*™. At home, where the game was played for pleasure, Danny's objective of winning was permitted to override a requirement to follow the rules of the game. In a home visit, the researcher asked his grandmother about games, and she responded that *Chutes and Ladders*™ is his favorite. His grandmother commented: "He cheats. He has something where he has to win [even though] I tell him he has to lose sometimes … . He is very smart, but he has to win." We presume, therefore, that Danny developed his strategies for winning—which involve quantitative manipulation—at home.

Although conceived of as "cheating" by the teacher and the grandmother, cheating had different meanings for each. For the teacher, teaching was a sociomoral issue. She warned Danny about being a cheater, and she regulated his play during her game with him, thus extinguishing his double-counting in his school play of this game. For the grandmother, Danny's cheating at *Chutes and Ladders*™ "to win" was coupled with "he is very smart." His cheating, therefore, was connected more with intelligence than with moral turpitude. At home, Danny was a child using intelligence and math skill to win. At school, Danny was a present and future student who needed to be morally instructed to be compliant with rules and regulations.

During a parent–teacher conference that the researcher attended, the researcher contributed her observations of Danny's double-counting while playing the game with her. The teacher said, "I never saw that." The researcher, teacher, and grandmother proceeded to discuss how Danny seemed to play the game differently with each of them. Danny's teacher was open to the new information about his mathe-

matical practices, and her curiosity was piqued. This was also true about observations of other children and their mathematical practices that we saw and shared with her. She was genuinely interested and felt our research was helping her to learn about the children.

Ronny

Ronny was an energetic 4-year-old who entered Head Start with previous preschool experience. He was perceived as disruptive, and often his responses to teachers or other children were considered inappropriate. Consequently, he was often separated from the other children. The teachers, with his mother's approval, had arranged for his participation in a program for children with developmental delays. Ronny was to go into kindergarten the following year; his teachers were concerned about his academic future as well as his behaviors.

Ronny frequently spent long stretches at the classroom computer playing during the 45-min free-choice period. He was familiar with the visual cues of computer games, and he was able to manipulate the mouse in response to the cues. The teacher commented to a researcher that she believed that Ronny was so often attracted to the computer because it offered the same gratification that watching TV at home gave him. She believed that Ronny was as difficult for his mother to handle as he was for her (the teacher) and that his mother used the TV as a "babysitter" to get time off for herself.

Ronny's mother, who characterized herself as wanting her son to have a good foundation in mathematics because it was an area in which she "fell down," explained Ronny's interest in the computer from her perspective. When she went to pick up Ronny at school, the teacher usually talked to her about his behavior, and she told us that she did not really understand what instruction her son was receiving on a daily basis. "He'll tell me that he worked on the computer or he drew a picture in school. He'll say, 'I played on the computer and read *Caps for Sale*.' He'll repeat the story and will tell me the numbers in the story like '50 cents a cap.'" At home, Ronny's mother provided him with a computer as well as flash cards and games, similar to her own early mathematical learning experiences. She did this to compensate for what she thought he might not be receiving in school. She had learned through using these materials with him that he preferred the computer to the numeric flash cards and math board games. She thought that the interactive features provided Ronny with verbal and visual feedback that stimulated his desire to do more and allowed him to concentrate for longer periods of time:

> [He likes] computer games and different programs. I've noticed that card games don't hold his attention. He doesn't sit through puzzles, but computers give him feedback and it's more exciting for him. He has an 'Author' [program] that helps him rec-

> ognize shapes like circles. He'll sit and concentrate on that because he wants to do the activities.

Discussion of Ronny

Ronny's story stresses the fragility of young children's emergent identities as students and learners. While Danny was being labeled a "cheater," Ronny was a "behavioral" problem. As with Danny, the teacher's interpretation of Ronny's behavior was masking his mathematical interests. Assumptions about Ronny's family life compounded the problem, contributing to the teacher's negative assessment of him and his home life. For Danny and for Ronny—as for too many young African American males—a "rocky" start in school can be devastating, closing off possible selves as effective users of mathematical knowledge and skills. Seeking the perspectives of parents and other caregivers who have observed the child as a learner in the context of the home, however, could be a way of interrupting such negative consequences, as we discuss later in this article.

In the next section, we theorize the travel of cultural resources into school contexts where pedagogical imperatives, teacher stances, and student practice interact to constitute social identities and mathematical learning.

THE TRAVEL OF CULTURAL RESOURCES

We can use these vignettes to conceptualize how mathematical practice, as cultural capital or resources, travels within and across contexts. Drawing on Bourdieu (1999), Lamont and Lareau (1988), Swartz (1997), and Lewis (2003), *cultural capital* is understood here to be those dispositions that are learned through sociocultural practice and include broad sets of knowledge, skills, and behaviors evoked in particular settings. According to Lewis,

> All students have acquired in their home and neighborhood lives important cultural resources, which serve as valuable assets in those settings. Problems arise when students enter new fields—for example, school—where these skills and knowledge sets are not rewarded. (p. 170)

We further conceptualize how cultural practices interact with contexts to constitute social identities. In the cases we present, evolving social identities may or may not represent the child's fullest, most capable, or most academically relevant identity.

Habitus is the word that Bourdieu uses as a particular aspect of cultural capital to describe systems of structured, structuring dispositions. Habitus organizes and generates practices that can be adapted to desired outcomes. For example, the game of *Chutes and Ladders*™ is structured in a particular way in Danny's home,

through regular practice to win, and, in turn, structures how Danny is disposed to play in the classroom with the researcher, an adult who is not the teacher. Bourdieu suggests that cultural capital may be more important than effort or so-called individual intelligence for school success (Bourdieu & Passeron, 1990). For Anna and Tammy, puzzle strategies and seeing the gap between today and Valentine's Day are formed through social interactions at home. Although not directly or fully valued academically by the teacher, the habitus of Anna and Tammy informs classroom performance in ways that enhance the teacher's perceptions of them and their identities as learners. Anna and Tammy's classroom performances map onto the mathematics competencies that the teacher, Ms. A, listed during an interview, which correlate with the Core Assessment and her goal to ready them for kindergarten. In addition, Ms. A found Anna to be a "calm child" who has "a lot of patience for everything."

Ms. A found the children to have classroom activity preferences, although "for the most part they are well-rounded." She noted when children chose activities outside of their gender roles, such as when Ronny tenderly carries a baby doll around and the girls chose blocks and Legos®. Yet, conflict emerged in her interview:

> I'd like them to choose what they'd like to do. I don't want to force them, but if it's something that I feel they need to do, I might encourage them. Even with Danny it got to the point where I said, "no, you can't go there." Not that I'm choosing where he's going. I'm choosing where he's not going. (Interview, 4/24/02)

We suspect that students' activity choices are also aspects of habitus that contribute (or do not) to readying children for kindergarten.

For Danny, however, habitus includes the practice of double-counting to win, as well as doing a jig at the joy of winning. Although successfully double-counting to win and Danny's jig appear to be separate activities, for Danny, these are imbricated aspects of playing the game. He enacts them spontaneously, perhaps without "consciousness or will" (Bourdieu, 1999, p. 112), when the social conditions evoke them. Successful double-counting evokes a jig; both are aspects of the whole social system, or habitus, of playing *Chutes and Ladders*™. The teacher does not see double-counting and the jig as mathematical practice, nor do these conjoined social practices enhance his academic identity. When she spoke of Danny in an interview, she referenced him as a young, "middle-range" child, who liked to play with Legos® and board games. Ms. A seemed to interpret Danny's preference for Legos® and board games as a problem to be controlled. She stated, "Danny, I won't let him go into the blocks or Legos®. I have to put my foot down because I told him there are other things in the classroom he can do." Similarly, she interprets Ronny's interest in computers as nonacademic and reinforces her perception of him as a disruptive child whose mother may have used TV entertain-

ment as a babysitter. In an interview, she stated, "I think it's like TV for him," and Ms. B followed with, "His mom doesn't bother him because it's her quiet time."

Anna, Tammy, Danny, and Ronny have brought home practices into the classroom when they were signaled by classroom materials and situations. Although some theorists have challenged the decontextualized notions of transfer theory as inadequate in explaining knowledge that is clearly located in situated experiences (Lave, 1988; Lerman, 2000), Lerman suggested that "learning to 'transfer' knowledge across practices is the practice" (p. 26) of mathematical knowledge. In other words, actually carrying a strategy learned in one setting across sites constitutes another practice—that of transfer, or travel, or switching, or syncretizing, or whatever the preferred metaphor might be. The knowledge, skill, and practice are carried across sites, and children are disposed to such practices when cued within a situation, as in the cases of Anna solving puzzles, Tammy calculating, Danny playing *Chutes and Ladders*™ with an adult who is not his teacher, and Ronny using computers. These children are mathematically skilled, and, in carrying their skills into school, they are additionally skilled.

Travel is a useful metaphor for emphasizing the movement of the practices of mathematical knowledge. In theorizing how knowledge and practices move across the sites of "home" and school, "travel" allows us to see across sites (Street, 1997) and into mathematics enacted in practice: in homes, neighborhoods, and classrooms.

Children travel across spaces, but they do not travel alone, nor do they travel unencumbered. They have voices in their heads, as Bakhtin (1986) showed us, and they carry habits, attitudes, and social identities along with them. Sometimes, they check those voices, habits, attitudes, and identities at the door. Often, the impermeability of the classroom teaches them to do so. In the earliest years of schooling, when games and blocks and social development count as learning, the child may be less apt to check nonschool knowledge at the door. But we can see in these vignettes that, even in preschool, there are curricular imperatives and pedagogical stances that neither encourage children's use of home numeracies nor harness them for further learning.

THE CONSTITUTION OF IDENTITIES

When Danny played as if he was at home when he was at school, Bourdieu (1999) might explain this as an example of how "a present past [Danny's double-counting to win and his jig] … tends to perpetuate itself into the future by reactivation in similarly structured practices [playing with an adult who is not the teacher]" (p. 109). When playing *Chutes and Ladders*™ in school was structured more like it was played at home—where winning was the goal in playing against an adult who was not the teacher—Danny brought his double-counting strategy, and his jig, into the game. He was disposed to practice double-counting and dancing. When he

played with the teacher, she introduced the preschool imperatives of socializing students to follow rules and "not be a cheater." Thus, Danny, through introduction of his home practices, gained an identity of being a "cheater."

For his grandmother, when Danny cheated at *Chutes and Ladders*™ "to win," it was coupled with "he is very smart." His cheating at home, therefore, was connected with intelligence and the goal of winning, which constituted Danny as intelligent and competitive. For the teacher, cheating was a sociomoral issue. She warned Danny and, while she and Danny played the game, she monitored his play, insisting on one-to-one number correspondence and that he follow the *Chutes and Ladders*™ path correctly. The teacher, situated in the imperatives of the curriculum, interpreted double-counting morally rather than mathematically and neglected to think of it as a cultural (and mathematical) resource for Danny, until the researcher brought it up. When she was made aware of Danny's double-counting as mathematical activity by the researcher, however, she found this interesting and was able to see her own practice, and Danny, in a new way.

Lave and Wenger (1991) reminded us that one way of looking at learning is as a social activity in which one is more or less a legitimate peripheral participant in a kind of apprenticeship to the contexts and people in which one is immersed. Danny, who already is a mathematician outside of school, needs to be a legitimate peripheral participant in becoming a mathematician in school, a newcomer to formal mathematics learning, and how to "do" school. Because "learning and a sense of identity are inseparable: they are aspects of the same phenomenon" (p. 115), it is important that Danny be seen as a competent user of mathematics in addition to or instead of being seen as a "cheater." Although it is appropriate that children be socialized to play by the rules as they become legitimate game players and community members, it is important to understand the developmental aspects of rule-governed behavior in children. In addition, we suggest that it may be just as important for Danny's identity as a mathematician to be socialized in school as it is for his behavior.

How we as educators understand the practices and strategies that children bring to school has consequences for them, perhaps more so for African American males such as Ronny and Danny, implicitly and too stereotypically constituted as "cheaters" and passive TV watchers. We can, instead, use these vignettes to imagine "possible selves" or identities for the children, to see them in what Bruner termed the *subjunctive mode of human possibilities* (Bruner, 1986, p. 26). We would like to imagine a context for learning math that would draw home and school knowledge, as well as discourses and habits (i.e., habitus), together as capital. We would like to keep possible futures for Danny and others dynamic and in play and to foster effective mathematical practices and a broad range of dispositions.

In the next section, we address classroom contexts that might be permeable to cultural resources and the types of professional development that have the potential to develop observational skills for teachers, as well as their ability to create pedagogy that harnesses children's cultural capital.

PRAXIS

In the fall of 2002 and the spring of 2003, we discussed our study and findings with several diverse teacher audiences (African American, White, and Latino) and central office administrators. Although our original intention in sharing the vignettes was to enrich our interpretation with the help of practitioners, we found that using the vignettes as source material for professional development can lead to provocative discussions and new possibilities for classroom practice. We found that teachers did not speak in one voice; we believe the tensions raised by their differing interpretations can stimulate new possibilities for understanding students and their competence in mathematics and for teacher discourse about low-income, often minority, urban families. What we heard has convinced us that vignettes of this type hold promise for changing teachers' stances toward urban children and suggest that more is needed to provide teachers with the skills to know, value, and harness the numeracy practices that children bring from home to school.

In this section, we share some of the responses of teachers and administrators. We focus on discussions of the Danny vignette, because it was the most provocative of the four cases for teachers and to illustrate the differing perspectives that emerged. Specifically, our practitioner audiences shared thoughts on Danny's preparation for success in school and in the future more generally, and they made judgments about his caregiver's approach to raising and instructing Danny.

Almost all of the teachers' responses to the Danny vignette focused on the "unsocial" and "unschooled" aspects of his game-playing. Some teachers worried that 3-year-old Danny was not well-socialized. One teacher's comment went so far as to allude to future criminal activity if his behavior persisted. The socialization imperatives of preschool overrode teachers' focus on mathematics, with typical comments such as, "He has to win all the time. He has to learn you can't win all the time. There are rules. Things are set up certain ways for a reason; he should be taught that right from the start." On the other hand, a small number of practitioners praised Danny's game-playing as showing intelligence and creativity. One of the teachers remarked, "The child is clever. He knew he had to do certain things to win … . He has number recognition and good problem-solving strategies. He could explain how to win the game [which shows] he can sequence verbally."

Teachers also worried that Danny's failure to follow the rules of the game predicted his future failure in the district's newly mandated Everyday Math curriculum, because it depends on cooperative group-work. Others thought he would love Everyday Math, because "he has a good number sense: he liked to manipulate. He will love Everyday Math; he will get to roll the dice."

Although several teachers were positive about the caregivers' efforts to engage Danny in school-like activities and games at home from which he could learn, the majority of teachers were critical of the manner in which his caregivers provided instruction. They also tended to blame the caregivers for deficiencies in socializing the child while involved in these activities. Some teachers believed that the care-

givers' failure to instruct children to "follow directions" makes their jobs more difficult. They stated the following: "I wonder if his parents go by the guidelines and have him follow directions. He should learn that events lead up to things; there are rules." "The parent/caretaker deal(s) with the child on one level and forget(s) he is one of many in school. It's important for him to follow the rules." In addition, in the case of Danny, some teachers spoke of the caregiver's limited knowledge of the facets of the game that strengthen mathematical thinking, presuming that she only saw the game as recreational: "There's not a connection to the grandmother's numeracy math understanding [of the game]. It's limited to what else is understood, more than numbers and counting. [It] reflects her understanding of what math is." A minority of the teachers and administrators did not worry about the child's future success because they found his behavior "on par" with other children his age: "Home and school (both) are teaching him the right way to do things. Kids are egocentric and want to win. He is a good thinker." "[What stood out to me was] how competitive kids are at this age. How he wanted to stand out."

The sessions with educators demonstrated to us that classroom teachers often believe that children's learning experiences at home should reinforce and reflect school practices. Teachers primarily viewed learning at home through a school lens, with the result that they saw only academic purposes for at-home activities, and the potential value of the home practices were overlooked. When this occurs, teachers view the home as deficient, and they miss opportunities to work with parents, and with home numeracy knowledge, to build connections between mathematics at home and at school. These sessions also showed, however, that when teachers have opportunities to reflect on children's home and school math, alternative points of view emerge that begin to challenge otherwise taken-for-granted, stereotypical assumptions about at-home learning and families.

These professional development sessions are the ones that we found most promising for growth and practice. For example, despite the discomfort that we anticipated the vignettes might generate for the focal teacher, she e-mailed us to say, "Thank you for doing this study … it has already helped me to become a better teacher through evaluating myself and making changes." She told us that Ronny's mother's reflection on why Ronny gravitated toward computers was a reminder that her (the teacher's) knowledge about the use of computers as a learning tool in the preschool classroom was limited, especially its potential with learners like Ronny, who are not amenable to the usual preschool stock of approaches to learning. One year later, she described small changes that she was making in her practice, including clearer, more explicit communication during home visits with the children's parents. She created a list of 30 things that "encourages" parents to do at-home support of the children to prepare for kindergarten. Ms. A shared that

> Analyzing my own beliefs about teaching and parent/teacher communication, I guess I always thought that if parents cared or wanted to know these things they would ask. Now I think that most parents are probably not going to ask, but that doesn't mean

> that they don't care or don't want to know, maybe it's just that they don't know how to ask … I need to take it upon myself to let my parents know. (e-mail of 10/17/02)

In addition, she stated that

> I don't think I ever looked at computers in an interactive way, like Ronny's mother described it, and I assumed that the computer provided Ronny with the same stimulation that a TV does. However, I do know that computers give children immediate feedback that 3–5 year olds need. (e-mail of 10/17/02)

We see Ms. A's ability to learn from and communicate with parents as an important step in the direction of opening the classroom to children's home knowledge. The principal of the school, who strongly supported this research, believed the process of faculty reflection on vignettes such as these reinforced a culture of teachers' learning from their practice—a culture that he is trying to develop in his school within a larger district climate that is increasingly regulated and assessment driven.

CONCLUDING THOUGHTS

This pilot study supports two of our initial theses: (a) there is much to be learned from the influence of complex social effects on children's mathematical achievement (or underachievement), and (b) information about these influences can be obtained through gathering data in natural settings using ethnographic methods. Our data suggest that mathematics achievement, or underachievement, has its roots in early schooling and is shaped by complex social factors, often unobserved, that cannot be summed up through simple categories of race, class, or socioeconomics. Nor can these complex social factors be accounted for in achievement data. Parents are often in the position of bridging sites for children. They buy workbooks, computer programs, and other school-like materials for imparting school knowledge to their children. Many provide time, space, and support for homework. They do not question the travel of school activity into the home. The hegemony of schooling requires that the home be permeable to schooling for success to be obtained for their children.

Yet, as we have shown, the social practices (i.e., habitus) of the home often shape the use of school-like materials. Even in the preschool Head Start classroom, where mainstream childhood games and materials abound, the skills and knowledge the children bring into the classroom is highly regulated. Although children can put puzzles together, count on a calendar, play *Chutes and Ladders*™, and use computers, the school lens too often shapes the interpretations of the teacher, affecting the teacher's view of the child's social identity, including the child's academic and behavioral promise. Although Danny can play *Chutes and Ladders*™ in

school, which is his favorite game from home, he cannot play the game with the teacher the same way that he plays it at home. Thus, the teacher does not see his double-counting as mathematics, and it is therefore unavailable to her and to Danny for further in-school mathematical learning. Making home-to-school connections is not merely about placing the artifacts of home in the classroom. It is also about opening the classroom to Danny's numeracy practices and critiquing dominant pedagogies that work to implicitly signal to children that their home-derived knowledge is not appropriate for school.

Teachers, who are in positions of educational authority and power, must also assume the responsibility of bridging sites and challenging hegemonies of formal school-based knowledge. Although teachers tend to aim in the direction of school-to-home, when teaching mathematical concepts, skills, and algorithms, they are less adept at valuing and harnessing what children know from their homes and bring to the classroom. Teachers, too, must travel across sites and structure curricula to be permeable to out-of-school practices to create contexts that will signal the use of mathematical practices that travel on the backs of such activities as childhood games. We see in Danny's grandmother, for example, evidence that she could bridge home and school in acknowledging the complexity of Danny being "smart" in terms of his mathematical prowess as well as someone who needs to learn to play by the rules. We have hope that teachers would develop strategies to recognize and capitalize on children's emerging knowledge, which is often drawn from home experiences. In the case of Danny, helping him to "stand out" as a mathematician might be accomplished through the use of games that rely on strategic thinking, played with adults who play by and model "the rules" and peers who, when developmentally appropriate, increasingly enforce the rules.

The concept of permeability is borrowed from Dyson's work (1997) in literacy, where she investigated the ways in which urban children draw on media resources to read and write. Dyson's study, like ours, elucidates impediments to the movement of knowledge that are both structural and conceptual. At a concrete level, the schoolhouse door or the presence of the teacher signals a leaving behind of one set of practices as a new site is entered. A permeable classroom is one that welcomes such home knowledge—that is, cultural capital or funds of knowledge (Moll et al., 1992). A permeable classroom is one that invokes tasks meant to draw on a wide range of knowledge. It is one where children do not check what they know at the classroom door. It is one that provides the signals, explicit and implicit, for children to draw on all that they know to be readers, writers, problem solvers, and thinkers.

Once children's knowledge and activity enter the classroom, there must be ways to harness what they know and can do. Goodman, Goodman, and Hood (1989) used the term *kidwatching* to describe what teachers do to know their students and draw on their strengths and needs to design instruction. In the descriptive review process, Carini (2000) implied strategies for teachers to collaborate in

knowing their students and bringing their diverse understandings of student activity to bear on teaching. Both of these processes can add layers of meaning to children's classroom activity rather than seek a single interpretation, thus keeping possible selves open and fluid (Bruner, 1986).

We propose that vignettes of children's social activities in home and school (where numeracy is central) can be used as primary source material for collective teacher reflection as an additional means to this end. In this way, Danny might develop the identity of a mathematician rather than of a cheater, and Ronny's computer use might reflect on his learner identity rather than the stereotypical identity of a disruptive, hard-to-manage child being pacified through TV watching: "Teaching all children successfully requires some reflection on the cultural rules that predominate classroom contexts and the way those rules do or do not reflect the cultural resources and understandings that children bring to school with them" (Lewis, 2003, p. 174). Best practices in teaching must include accommodation of the diverse ways of knowing and learning that children bring to school (Delpit, 1993; Ladson-Billings, 1994; Nieto, 1992/1996), and culturally relevant instruction must foster teachers' abilities to see, value, and harness student knowledge.

In this article, we have drawn attention to several issues, including (a) numeracy practices travel with children in and out of the multiple and complex contexts of their lives, (b) parents and teachers may or may not interact with each other about children's home and school numeracy practices and learning experiences, (c) classroom practices are shaped by the school imperatives of meeting assessment requirements and socializing children into school behavior, and (d) how teachers and parents recognize and respond to numeracy practices shapes identities of numeracy and character. We suggest that ethnographic vignettes such as these can form the basis for a powerful form of professional development when shared with teachers and administrators and when coupled with meaningful observation, reflection, and analysis methods. We further suggest that research of this type is necessary for understanding the complex implications of sociocultural factors in underachievement. This study is limited in its scope, and the cases were too few to perform an adequate gender analysis, for example. In addition, longitudinal studies of this type are necessary to explore more fully the connections between underachievement, habitus, and social identities and their concomitant consequences for children.

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