Literacy Knowledge in Practice: Contexts of Participation for Young Writers and Readers

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Children's earliest discoveries about written language are learned through active engagement with their social and cultural worlds (Bissex, 1980; Teale & Sulzby, 1986). They interact with others in writing and reading situations, explore print on their own, and experiment with different forms, inventing their own literacies. As they engage in these meaningful activities, children develop knowledge about the forms and functions of written language in situational contexts (Goodman, 1986; Lass, 1982). Consequently, environments that are embedded with rich written language experiences provide opportunities for children to become naturally involved in literacy-related events. Such settings include not only physical surroundings, but human relationships that determine when, how often, and in what situations children may engage in using the cultural tools of literacy—materials, uses, and meanings (Neuman & Roskos, 1992; Tharp & Gallimore, 1988).

The developing child, however, is not merely a tabula rasa on which the environment makes its impact, but part of a dynamic system (Bronfenbrenner, 1977). Children use the resources and constraints of the social and physical environment, as well as their relevant knowledge and skills, to analyze and construct their understandings of print and their world. As emphasized by Vygotsky (1978), in these contexts they practice using the cognitive tools (i.e., books, paper, writing tools) in problem-solving situations through interaction with peers

and more experienced members of society. Thinking develops out of this external social activity through internalization of the processes and practices provided by the sociocultural context. Therefore, children's learning about literacy is integrally tied with practical action, resulting from their need to control, manipulate, and function in their environment.

As children enter more formal learning contexts in school, literacy activities tend to become removed from the context of socially relevant action, to contexts in which "words are the major invitations to form concepts rather than the action" (Bruner, Olver, & Greenfield, 1966, p. 62). Unlike everyday situations, verbal rules or generalizations in school learning may precede or, in some cases, substitute for their referents in practical contexts. Much of children's formal education may typically involve them in learning techniques for processing information (e.g., identifying letters, sounds, and words; computation skills), apart from their functional relation, with the assumption that what is learned at the time may be useful later on. According to Scribner and Cole (1973a) in their classic article comparing formal and informal instruction, such learning practices by their very nature are discontinuous with those of everyday life and may contradict the kinds of learning situations and cultural practices that exist in the society outside of school. In contrast to "out of context school learning" (p. 556), involvement with written language includes a range of

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CHILDREN'S EARLIEST discoveries about written language are closely tied to daily activities as they interact with others in writing and reading situations. Thus, one way to examine literacy in its earliest forms is to explore literacy knowledge in the practice of ongoing activity. Using activity as the basic unit of analysis (Leon'tev, 1981; Vygotsky, 1978), this study investigated young children's literacy activity within play settings designed to reflect authentic literacy contexts in children's real-world environment. Three literacy-related settings were created in an Even Start preschool class: post office, restaurant, and doctor's office. Over a 7-month period, 30 preschoolers (fifteen 3-year-olds; fifteen 4-year-olds) were observed 1 day a week as they engaged in their free-play activity. Data were qualitatively analyzed using the constant-comparative approach, and five key features of context described. Results of the study indicated that in the course of play activities, children demonstrated declarative knowledge about literacy (e.g., roles, and names of literacy objects), procedural knowledge (e.g., routines), and strategic knowledge (e.g., metacognition). In these contexts, 3- and 4-year-old children adapted the tools of literacy for specific purposes and engaged in strategic behaviors in a variety of problem-solving situations, giving evidence to the rich repertoire of literacy knowledge and inventive heuristics they bring to these informal settings.

El conocimiento de la lectoescritura en práctica: Contextos de participación para escritores y lectores pequeños

LOS PRIMEROS descubrimientos de los niños acerca del lenguaje escrito están estrechamente relacionados con las actividades en las que están inmersos mientras interactúan con otros en situaciones de escritura y lectura. Por lo tanto, una forma de examinar la lectoescritura en sus formas iniciales es explorar el conocimiento de la lectoescritura en la práctica de actividades en curso. Usando la actividad como unidad básica de análisis (Leon'tev, 1981; Vygotsky, 1978), este estudio investigó las actividades de lectoescritura de niños pequeños en situaciones de juego diseñadas para reflejar contextos de lectoescritura auténticos en el entorno del mundo real de los niños. Se crearon tres situaciones de lectoescritura en una clase de Jardín de Infantes: el correo, el restaurante y el consultorio del médico. Durante un período de siete meses, se observó a 30 niños (15 de tres años; 15 de cuatro años), un día por semana, mientras estaban dedicados al juego libre. Los datos se analizaron cualitativamente usando el enfoque constante-comparativo y se describieron cinco rasgos clave del contexto. Los resultados del estudio indicaron que, en el curso de las actividades de juego, los niños demostraron conocimiento declarativo acerca de la lectoescritura (p.ej., roles y nombres de objetos viculados a la lectoescritura), conocimiento procesal (p.ej., rutinas) y conocimiento estratégico (p.ej., metacognición). En estos contextos, los pequeños de 3 y 4 años adaptaron las herramientas de la lectoescritura a propósitos específicos y se involucraron en comportamientos estratégicos en una variedad de situaciones de resolución de problemas, proporcionando evidencia acerca del rico repertorio de conocimientos sobre la lectoescritura y heurística inventiva que aportan a estas situaciones informales.

Lese- und Schreibkenntnisse in der Praxis: Situative Zusammenhänge in der Literarisierung von jungen Schreibern und Lesern

DIE FRÜHESTEN Entdeckungen, die Kindern in der geschriebenen Sprache machen, sind eng verknüpft mit Alltagsaktivitäten, in welche diese eingebettet ist, wenn Kinder mit anderen in Lese- und Schreibsituationen kommunizieren. Deshalb ist ein Weg zur Erforschung der frühesten Literarisierungsformen die Beobachtung der Lese- und Schreibkenntnisse in Zusammenhang mit natürlichen Aktivitäten in der Praxis. In dieser Studie wurden Aktivitäten als Ausgangsbasis der Analyse (Leon'tev, 1981; Vygotsky, 1978) verwendet, indem die Aktivitäten junger Kinder in solchen Spielsituationen beobachtet wurden, die so gestaltet waren, daß sie authentische Zusammenhänge in der Literarisierung in einer für Kinder natürlichen Umwelt widerspiegelten. Drei Situationen, verknüpft mit Lese- und Schreibanlässen, wurden zu Beginn in einer Vorschulklasse geschaffen: ein Postamt, ein Restaurant, die Ordination eines Arztes. Über einen Zeitraum von 7 Monaten wurden 30 Vorschulkinder (15 Dreijährige, 15 Vierjährige) jeweils an einem Tag der Woche beobachtet, als sie sich im freien Spiel betätigten. Die erhobenen Daten wurden ihrer Qualität nach mittels eines ständig vergleichenden Verfahrens analysiert, und fünf Schlüsselaspekte wurden im Gesamtzusammenhang beschrieben. Die Ergebnisse der Studie zeigen, daß im Verlauf der Spielaktivitäten die Kinder ausgewiesene Kenntnisse in der Literarisierung zeigten (z.B. Rollen- und Objektbezeichnungen), Kenntnisse von Vorgangsweisen (z.B. Arbeitsroutinen), Kenntnisse von Strategien (z.B. über zugrundeliegende Voraussetzungen). In diesen Zusammenhängen eigneten sich die Drei- und Vierjährigen "Literarisierungswerkzeuge" für bestimmte Zwecke an und wurde dazu veranlaßt, bestimmte Verhaltensstrategien zur Lösung von situationsbedingten Problemen zu entwickeln, wobei ein reiches Repertoire von Lese- und Schreibkenntnissen ebenso deutlich sichtbar wurde wie von erfindungsreichen, heuristischen Methoden, die die Kinder selbst in diesem informellen Lernbereich einbrachten.

読み書き知識の活用：読み書きする児童たちをとりまくコンテクスト

児童が最初に書き言葉について発見する過程は子供が読んだり書いたりしながら、まわりの人とやりとりすることによって次第に組み込まれていく日常生活と密接に結びついている。従って読み書きの初期段階を調査する1つの方法としては、子供たちが日常生活で使っている読み書き知識を探求してみることである。分析の基本項目として活動している場を使う (Leon'tev, 1981; Vygotsky, 1978) にあたり、この研究では子供たちが実生活で実際に読んだり書いたりするコンテクストを反映するような遊びの場を作ってやり、そこでの読み書き活動を調査した。郵便局、レストラン、お医者さんといった読み書き活動を伴う3つの場がEven Start保育園に設定され、そこで自由に遊んでいる30人の保育園児が週に1度の割合で7ヶ月以上にわたって観察された。データは定数比較分析手法と5つの主なコンテクストの特徴を使って質的分析がなされた。結果として分かったことは、遊んでいる最中に子供たちが読み書きについて叙述する知識（例、役割とか読み書き対象物の名前）、手順の知識（例、日常的おきまりの流れ）、そしてどう対処すべきかという知識（例、メタ認知）を使っているということであった。与えられたコンテクストの中で3歳児と4歳児はある特定の目的のために読み書きという手段を応用し、様々な問題を解決するためにどのように対処したらいいかという行動に携わっていた。そしてそれは子供たちが豊富な読み書き知識のパターンやそうした遊びの場で使える発明・発見的手法を持っているということを示す証拠となるものである。

La connaissance du lire-écrire en pratique: les contextes de la participation de jeunes lecteurs et scripteurs

LES TOUTES premières découvertes des enfants relatives à l'écrit sont étroitement liées aux activités quotidiennes dans lesquelles ils sont insérés quand ils interagissent avec les autres dans des situations de lecture et d'écriture. Ainsi, une façon d'examiner le lire-écrire dans ses toutes premières manifestations consiste à explorer la connaissance de l'écrit dans la pratique d'activités courantes. En prenant l'activité comme unité de base de l'analyse (Léontiev, 1981; Vygotsky, 1978), cette étude a examiné l'activité de lecture-écriture des jeunes enfants au cours de situations de jeu organisées de façon à constituer un reflet des contextes de lecture-écriture de l'environnement qui constitue le monde réel des enfants. On a créé trois situations liées à l'écrit dans une classe de niveau préscolaire Even Start: le bureau de poste, le restaurant, et le cabinet du médecin. Pendant une durée de 7 mois, on a observé 30 enfants d'âge préscolaire (15 enfants âgés de trois ans; quinze enfants âgés de quatre ans), à raison d'un jour par semaine, au moment où ils étaient engagés dans une activité de jeu libre. On a effectué une analyse qualitative des données en maintenant constante l'approche comparative, et décrit cinq caractéristiques-clé du contexte. Les résultats de l'étude ont indiqué que, au cours des activités de jeu, les enfants ont manifesté des connaissances d'ordre déclaratif (rôles, noms d'objets se rapportant à l'écrit), des connaissances d'ordre procédural (routines), et des connaissances d'ordre stratégique (métacognition). Dans ces contextes, les enfants de 3–4 ans ont adapté les outils de l'écrit à des fins spécifiques et se sont engagés dans des comportements stratégiques dans toutes sortes de situations de résolution de problèmes, en faisant preuve d'un riche répertoire de connaissances relatives à l'écrit et d'heuristiques inventives apportées à ces situations informelles.

activities that vary in different cultural contexts and for a variety of functional purposes.

Consequently, the concept of moving everyday life into schools to reflect more authentic situations has become regarded as essential in the process of enculturating literacy learning (Brown, Collins, & Duguid, 1989). Authentic activities reflect practices that individuals typically exercise in day-to-day situations. They are the ordinary practices of the culture—what people do in daily, weekly, and monthly cycles of activity. Such practices, for example, include shopping for the best bargain, figuring out the fat content of a favorite food, and examining health care options on an insurance policy.

These activities, shown in a large number of ethnographic studies of everyday cognition (Childs & Greenfield, 1980; Lave, Murtaugh, & de la Rocha, 1984; Scribner, 1984; Scribner & Cole, 1973b), appear to be different than school-related tasks. Lave et al. (1984), for example, examining the routines of grocery shopping, found that the dialectic of arithmetic in grocery shopping was shaped by the context of the activity. The problem-solving arithmetic tasks that were generated in this context involved shoppers' values and beliefs, as well as opportunistic solutions—behaviors that bore little resemblance to paper-and-pencil arithmetic tasks. Rather than the use of explicit, formal rules, it was the activity that shaped and refined how the tool (in this case, arithmetic) was used for subsequent action.

Social practice proponents argue that knowledge in practice constitutes a more powerful source of socialization than traditional, didactic teaching (Collins, Brown, & Newman, 1989; Lave, 1988; Scribner, 1986). In practice, the occasions and conditions for using literacy or arithmetic arise directly out of the context and are framed by the way in which other members of that community see the world (Brown et al., 1989). The apprentice, for example, becomes expert by observing, being coached by a mentor, and practicing the skills to be learned. Similar to Wood, Bruner, and Ross's (1976) conception of comprehending the act, observation first provides a global picture, which then acts as a guide to subsequent learning. The conceptual model then is used to monitor progress as the apprentice becomes increasingly proficient through successive approximations. In the course of learning through activity and social interaction, the apprentice becomes enculturated in a community of practice (Brown et al., 1989).

Thus, in contrast to formal schooling, an apprenticeship model embeds the learning of skills, strategies, and knowledge in their social and functional context. In this context, learners have access to experts as well as novice learners, who may serve as benchmarks for their own progress. In fact, several aspects of this apprentice-

ship model have been used successfully for teaching processes that experts use to handle complex tasks. Collins et al. (1989), for example, described a learning model of *cognitive apprenticeship*, which focuses on learning through guided experience and highlights the cognitive and metacognitive processes, rather than the physical skills and processes of a traditional apprenticeship, which comprise expertise in areas like reading, writing, and math. The cognitive apprenticeship model involves alternating responses between expert and novice in a shared problem-solving situation; in this manner, students are made sensitive to the details of expert performance as they are encouraged to make incremental adjustments in their own performance. Palincsar and Brown's (1984) reciprocal teaching model and Scardamalia and Bereiter's (1985) procedural facilitation in writing are examples of approaches in this tradition.

Yet, the cognitive apprenticeship model still relies on decontextualizing knowledge, assuming transferability of these knowledge, skills, and strategies to new settings (Collins et al., 1989). Another approach to situated learning in school is to create authentic contexts for which literacy can be used to meet the demands of a situation. This approach focuses on thinking in practice, rather than on thinking as separate from doing. Consistent with the sociocultural theory of Vygotsky (1978) and Leont'ev (1981), context and the child's activity are seen as inseparable, their meanings derived as jointly producing psychological events. Through activity, it assumes that occasions for thinking are subjectively experienced, that cognitive and metacognitive processes are employed to meet the problem solver's functional needs, and that these processes are adapted and extended with each new experience (Rogoff, 1982). In this view activities create an arena that may stimulate active knowledge construction.

Thus, if children's earliest conceptions of literacy are closely tied to practices in which they are embedded, one way to examine their development is to study literacy knowledge in practice. In this case, the practices or activities themselves become objects of analysis (Leont'ev, 1981; Scribner, 1984). Observing a child's attempts at reading a letter or writing a grocery list, for example, may reveal important understandings about how literacy is used and adapted to get things done and what strategic processes may be involved in these situations.

Using activity as the basic unit of analysis, however, carries several important implications for what we study. First, the focus on activity as a basic unit emphasizes children's adaptations of literacy objects and tools in active terms, highlighting processes more than outcomes or products. Second, and relatedly, the activity as the unit of analysis emphasizes literacy as social adapta-

Table 1   Description of the sample (N=30)

Category	3-year-olds	4-year-olds
Age in months	$M = 42.56$ $(SD = 2.38)$	$M = 56.56$ $(SD = 2.45)$
Gender		
Males	5 boys	7 boys
Females	10 girls	8 girls
Peabody Picture		
Vocabulary Test (PPVT)	$M = 20.21$ $(SD = 24.47)$	$M = 24.34$ $(SD = 28.66)$
Ethnicity		
European American	2	1
Greek	1	1
Haitian	1	0
Italian	3	4
Brazilian	1	1
Portuguese	2	1
Ugandan	1	0
Honduras	1	1
Vietnamese	1	0
German	2	0
Lebanese	0	2
Syrian	0	1
Nigerian	0	1
Colombian	0	2

tion applied in the course of practical action, thereby varying across different contexts and problem-solving situations. And third, the focus on activity emphasizes what children actively do (e.g., exploring, problem solving) rather than who they are in terms of their status characteristics (e.g., socioeconomic status).

Specifically, a focus on children's literacy-related activity may address the following questions: (a) What features distinguish literacy in practice? (b) What knowledges do these activities require? and (c) What cognitive and metacognitive operations may be involved in these activities? Responses to these questions may reveal a rich repertoire of knowledge and understandings that children, through interactions with their world, bring to literacy and may serve as an important foundation for building more complex concepts. Further, an examination of literacy in practice could reveal important aspects of context that support literacy learning in these early years. Incorporating these aspects into classroom instruction could potentially provide better continuity between home and school practices, integrating literacy learning with practical everyday activity.

Although the importance of context in early literacy learning is certainly not a new concern, much of the research to date has focused on context as a scaffold for children's developing awareness of print (Goodman & Altwerger, 1981; Masonheimer, Drum, & Ehri, 1984; McGee, Lomax, & Head, 1988; Neuman & Roskos, 1993). In contrast, this study was designed to investigate young children's literacy activity as it was intricately interwoven within settings designed to reflect literacy-related situations in children's real-world environment. Since play is where much of young children's exploration and learning takes place (Bruner, 1972), three literacy-related play settings reflecting design principles of real-life environments became the arena in which to observe children's literacy in practice. Our goal was to capture the multifaceted knowledge and behaviors that may constitute early literacy practices for these developing 3- and 4-year-old children, viewing literacy in its development not as a series of acquisitions of skills but as a series of transformations and adaptations across events and settings.

Method

Subjects and setting

Thirty preschoolers (fifteen 3-year-olds; fifteen 4-year-olds), from a collaborative state-funded (Massachusetts early childhood initiative) multicultural preschool project and federally funded Even Start program in a diverse low- to middle-income community participated in the study. Six of the 30 families received public assistance. Serving families from 14 ethnic communities, the program was designed for children from non–English-speaking or bilingual homes and/or low-income families. The majority of the children were born

in the U.S. and spoke English as their primary language, with some facility in the family's native language. Thirty percent of the children were bilingual.

Prior to children's entrance in the program, teachers were required by a national Even Start evaluation team to individually administer the Peabody Picture Vocabulary Test (PPVT) to children. PPVT scores for the 3-year-olds averaged 20% (SD = 24.47) and for the 4-year-olds, 24% (SD = 28.66). Descriptive statistics of the sample are presented in Table 1.

The program was administered by Marcia Krasnow and supported by a program coordinator, three certified early childhood teachers, and a telecommunications specialist. As part of its service to the community, an innovative feature of the program was to disseminate information on early childhood practices and parenting education for those families with children over the target age or children unable to attend a preschool program. The preschool was technically equipped as a studio to videotape children's activities in centers throughout the room. Three remote control cameras and seven omnidirectional microphones with six additional wireless microphones distributed throughout the area provided picture and sound capabilities of broadcast quality. In a separate studio, the telecommunications specialist directed the cameras to follow the children's actions and to continuously monitor the audio quality. An edited version with teacher narration of the children's activities for the day was then broadcast to the surrounding community on a local-access cable channel.

Three-year-old children attended Tuesday and Thursday mornings and 4-year-olds on Monday, Wednesday, and Friday, from 9:00 to 11:00 a.m. Daily activities included inquiry-based projects, art, music, motor coordination activities, and approximately 30 to 40 minutes per day for indoor or outdoor free play. Teachers incorporated multiculturalism, using parents as a primary resource, through many of the children's activities in storybook reading, music, art, and snack time. In this English immersion program, however, the language spoken by teachers and children was English.

Prior to our involvement, the physical organization of the 50' × 50' preschool room included a book corner, a little writing table, and art, kitchen, and block areas. As part of the collaborative effort with Even Start (i.e., a focus on family literacy), the director sought to enhance these play areas in ways that might demonstrate children's early literacy activity to the families served in the program as well as to the local community. Eliciting ideas from parents as well as the children themselves, the teachers and the researchers designed three literacy-related play areas: a post office, a family restaurant, and a doctor's office.

Intervention design

Reviewing ecological studies from play research and cognitive performance (Bjorklund, Muir-Broaddus, & Schneider, 1990; Morrow, 1990; Neuman & Roskos, 1992; Rogoff, 1982; Weinstein, 1979), we examined environmental design factors that might best provide opportunities for literacy in practice activity. Several factors appeared especially important for creating these activity settings for young children: (a) organization, (b) familiarity of objects and operations, (c) meaningfulness of activity, and (d) social resources.

Organization of settings. Children reveal what they know and can do to the extent that an environment is supportive of their efforts (Bjorklund et al., 1990). It is widely accepted, for example, that children perform better in situations that are familiar to them (DeLoache & Brown, 1987; Perkins, 1993). Similarly, contexts that incorporate everyday literacy practices of family and community suggest settings with identifiable frameworks (i.e., names, scripts) that encourage children to use what they know to generate new information.

Familiarity of objects and operations in settings. Children show more advanced thinking when highly typical materials are available for use with a task (Bruner, 1983; Neuman & Roskos, 1992). The value of object familiarity and prior experience is well documented in play research (Garvey, 1977; McLane & McNamee, 1990). Pretense is facilitated by prototypical objects and settings that evoke everyday experiences, especially in its early stages. Thus, the relative familiarity children have with objects and operations to be performed with them facilitates their ability to use what they know, to demonstrate their competence, and to create new behavioral combinations.

Meaningfulness of activity in settings. A setting's potential is realized only to the extent its activity has meaning for its participants. Studies of young children's problem solving and planning skills demonstrate the power of purpose for revealing cognitive competence (DeLoache & Brown, 1987; Rogoff, Mosier, Mistry, & Goncu, 1993; Rubin, Fein, & Vandenberg, 1983). For young children, purposeful, goal-directed activity is often embedded in game-like or play situations, which afford greater opportunity to pursue goals that are personally motivating and meaningful. Play provides a means to practice what has been observed in the home and community with reduced risk of censure and to experiment with ideas and objects with less fear of consequences (Bruner, 1972; Vygotsky, 1967). Pretend play allows children to borrow and create roles, adopt and change roles, exploit and alter procedures, use language to make sense, and negotiate and persuade; in sum, they play with symbols and conventions of their culture.
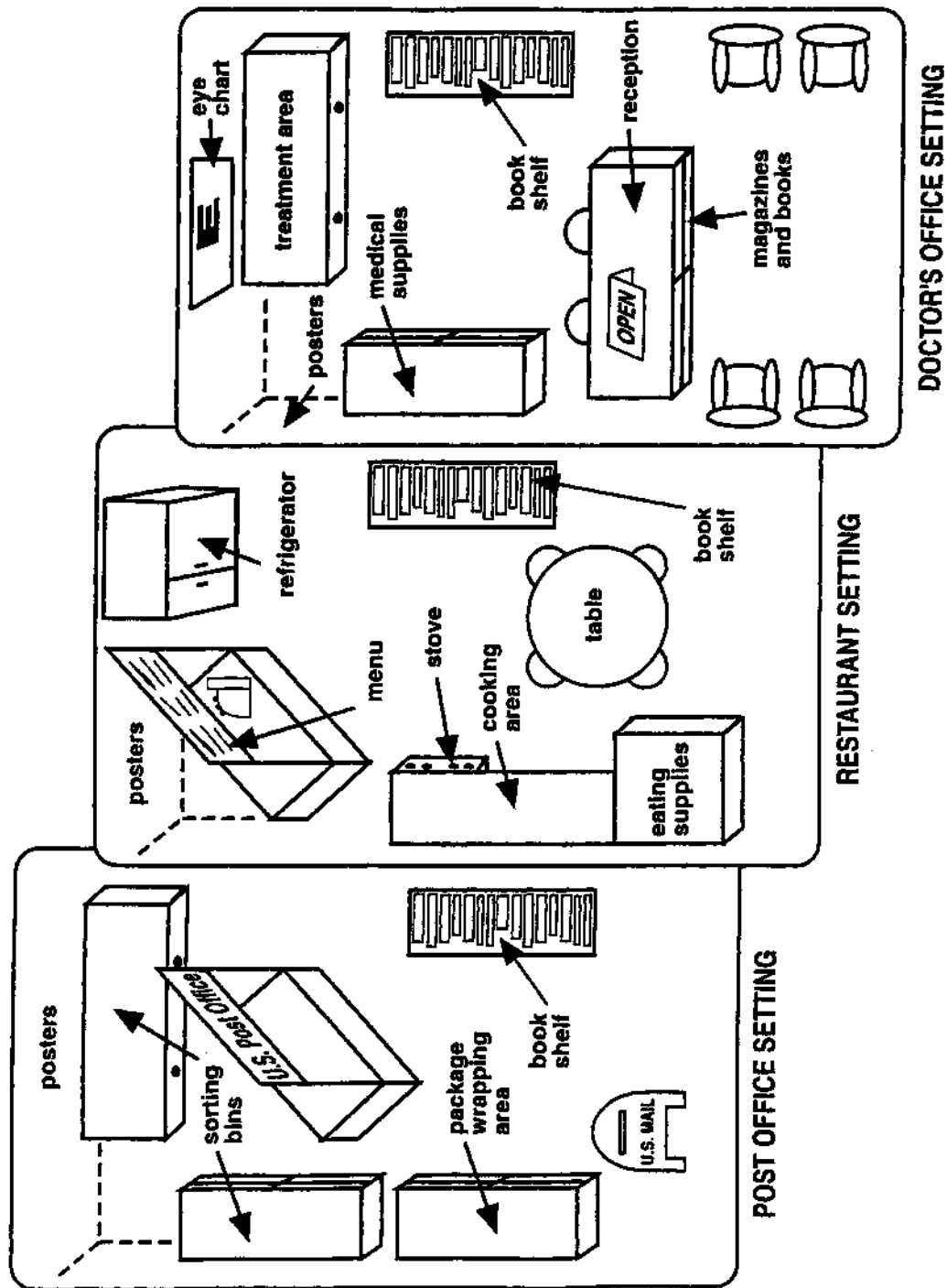
Figure 1 Three literacy-related play settings

Social resources in settings. The richest and most elaborate resource available to children in their natural environment is observing other people in that setting. Studies of collaboration between peers suggest that joint work stimulates initiative, attention to details of performance, and commitment to activity (Brown et al., 1993; Forman & McPhail, 1993; Neuman & Roskos, 1991). In addition, there is some evidence that more expert play partners can facilitate the social pretense in low-play peers and not at their own expense (Fryer & Fein, 1995). Their more capable demonstrations of "just pretend" appear to teach their less skilled peers how to think symbolically with a greater store of information available in their environment.

A synthesis of research, therefore, suggests that authentic arenas for literacy action should reflect what children see in their everyday contexts and include relevant, familiar literacy objects and tools within the realm of their experiences. Settings that invite explorations of literacy objects, routines, scripts, and roles enable children to demonstrate their developing understandings and interaction with others. Regardless of whether settings are real or imagined, as Lave (1988) has argued, these settings should provide for *authentic dilemmas* that offer children opportunities to use literacy, create problem-solving situations, and improvise solutions.

Using these criteria the teachers and researchers created three literacy-enriched settings specifically adapted to our young children's abilities, interests, and prior experiences: the post office, a restaurant, and the doctor's office. All three represented arenas of activity that incorporated literacy practices commonly found in the children's immediate environment as reported by their parents and teachers. The children, for example, were particularly familiar with the local post office because their parents, as recent immigrants, frequently exchanged mail and packages with relatives in their native countries.

The settings were supplied with relevant literacy objects, props, and environmental print that were familiar and functional to the children and were organized to encourage sustained play activity, accommodating 3 to 4 children at a time. As indicated in Figure 1, each setting was clearly marked in the environment using architectural features to define its space and printed signs to indicate its purpose. Objects and props were attractively arranged to draw children into pretend play activity and were of sufficient complexity to elicit multiple interactions. For example, the post office included various sized bins and trays for organizing paper, sorting mail, or storing and stacking supplies. Transfer of props from one setting to another encouraged flexibility in the use of the

materials. Table 2 summarizes the environmental features of the settings tailored to our sample.

Procedure

The study was conducted over a 7-month period, beginning in November and ending in May. Data were collected through observations, videotape analyses, and weekly informal conversations with teachers and the telecommunications specialist. Since our goal was to discover how 3- and 4-year-old children used literacy in practice, all observations were conducted in the control room to avoid distractions from any outside observers.

Children were introduced to the literacy-related play settings in several steps following an apprenticeship model. Prior to creating the post office play area, teachers talked and read stories to children about visiting a post office. Several days later, they visited the local post office, spoke to postal workers, and brought back a number of artifacts (e.g., posters, express mail envelopes, and cartons). Following their visit, teachers gave a grand tour of the new play setting that the teachers and the researchers had developed together, describing the materials and the names of the objects (e.g., mailbag), and modeling several pretend scenarios. In the days that followed, teachers participated in play activity as coplayers (Roskos & Neuman, 1993) when they perceived that children would benefit from an adult presence; however, as play progressed, they increasingly shifted their role to that of observers. In this respect, we attempted to follow the crucial features of traditional apprenticeship from a teacher's point of view through modeling, coaching, and fading (Collins et al., 1989). Using similar procedures, after a 2-week period teachers introduced the redesigned second setting, the family restaurant (they visited a fast-food restaurant), followed 3 weeks later by the doctor's play office setting (a doctor and her nurse visited the classroom). Once play in these areas was established, teachers adopted an observer role (rather than coplayer), allowing us to focus on child-initiated activity.

The telecommunications specialist followed children's literacy play activity 1 day per week for each program (3- and 4-year-olds) over the next 20 weeks. Children were free to play in any area for approximately 25–30 minutes, with space considerations the only restriction (no more than 5 in a setting). No attempt was made to control the number of times a child played in these areas or to ensure every child's participation. Instead, we were interested in capturing as well as possible their interactions in these settings. Rather than focus on a preselected area, cameras followed the children's free play activity. If there was little activity in one setting and much activity in another, for example, the cameras

Table 2   Description of authentic play settings

Setting	Organization	Familiarity	Meaningfulness		Social resources
		Objects	Typical operations in real-life settings	Potential meaning making activities	
Post office	local post office	paper stationery envelopes pencils markers stamps greeting cards express mail	writing letters	pretending to write letters pretending to receive letters pretending to be a postal worker/ mail officer	peers, occasional teacher visits
		mailbag mailbox sorting trays hat/pouch stampers stamp pads related signs (e.g., MAIL)	mailing letters receiving letters		
		packages wrapping paper weigh scale bins/trays labels markers related books	sending packages receiving packages		
Restaurant	fast-food restaurant	menus order pad pencil markers wall menu related signs (e.g., EXIT)	ordering food	pretending to cook food pretending to serve food pretending to be a customer pretending to own a restaurant	peers, parents, teachers
		order form food placemats utensils	serving food		
		bill credit cards play money bank checks cash register related books (e.g., cookbooks)	paying for food		
Doctor's office	health clinic	appointment book pencils markers calendars note paper insurance forms bank checks play money file folders related signs (e.g., OFFICE) related books (e.g., visits to the doctor's office)	making appointment paying bills pretending to be a receptionist	pretending to be sick pretending to be a doctor pretending to be a nurse playing hospital	peers, parents, teachers
		paper clipboard eye chart emergency procedures	recording symptoms		
		memo paper pill boxes	writing prescriptions		

would pursue the activity and record the setting in which it took place. If there was no activity in any of the three settings, the cameras would fade and turn on only if children came into one of the areas. Thus, the emphasis was on the activity and the setting, and not on the individual child.

A video log was maintained throughout the study indicating the number of children and the settings most frequently visited. Other activities such as block-building or art in the other play areas were not recorded at these times.

Weekly observations were conducted in the control room to ensure that the play settings provided children with opportunity to use literacy in authentic situations, to examine whether children were stimulated to play in these areas, and to regularly infuse new materials and multicultural artifacts in the settings. Following observations, informal conversations were held with administrators and teachers to elicit their feedback and to discuss the quality of children's language activity and play. Over 20 hours of videotaped play were recorded: 7.7 hours in the post office, 6.2 in the family restaurant, and 6.9 in the doctor's office.

Data analysis. The focus of our analysis was to examine children's literacy knowledge and strategies in practice and the key features of these interactions. Data analysis was carried out in several phases. First, all tapes were reviewed to establish literacy-related play episodes. An episode was defined as an interrelated set of goal-directed actions and dialogue in literacy play activity (Kantor, Miller, & Fernie, 1992). We eliminated independent play actions, such as playing with the cash register keys or playing with a stamp pad, because they appeared more exploratory in nature. We also eliminated literacy episodes that were prompted or directed by the teacher. Included in the analysis, however, were those episodes that might involve the teacher or a parent as participant in a minor role. Seventy-six episodes, in total, were recorded. Each episode was transcribed verbatim and annotated with field notes from observations, recording the setting, the number of children, and the play activity (see Table 3).

We examined these transcriptions for the features of literacy in practice (e.g., how children go about solving literacy-related problems in authentic situations), the knowledges and purposes for writing and reading, and the types of strategies that children seemed to use in the process of their goal-directed actions. Using the constant-comparative method to analyze and reduce the primary data into codifiable categories (Glaser & Strauss, 1967), we first sought to identify salient characteristics of contextualized literacy practice. Through repeated readings, viewings, and discussions, we compared episodes across

Table 3 Summary of literacy episodes ($N = 76$)

Category	3-year-olds	4-year-olds
Total number of episodes	28	48
Number of episodes per setting		
Post office	16	16
Restaurant	7	18
Doctor's office	5	12
Total number of children visiting play areas	14	13
Average number of children in each episode	3	4
Total number of hours videotaped	10.37	10.43

settings to determine features that best reflected context as a jointly produced event. Typological dimensions of context were generated, then refined by comparing these features with previous episodes. For example, accessibility to literacy tools, recorded as an important feature of context in our initial analysis, was examined across all episodes so that generalized statements about tool availability and use could be developed.

Second, we examined through typological analysis the types of domain-specific literacy knowledge employed in activities. Typological analysis involves dividing observed phenomena into categories that appear to describe events or relationships in settings (Goetz & LeCompte, 1984). Our readings indicated two types of working knowledge: declarative and procedural.

For example, in one interaction, Kara tells Lisa, "They're stamps. You use them to mail a letter." This type of interchange was labeled *declarative knowledge*, indicating *I know that* (Bruner, 1972; Farnham-Diggory, 1994). In this instance, Kara's statement indicated that she knew the name and function of a literacy object.

Children's activities also indicated information about how to go about various literacy-related actions. Following Kara's interchange, for example, she put a letter in the mailbox. Here, her actions indicated *procedural knowledge*, reflecting information about a literacy routine (Bruner, 1972; Farnham-Diggory, 1994; Paris, Lipson, & Wixson, 1983). In this example, Kara's actions demonstrated that she *knew how to* mail a letter. Situations that included both knowing that and knowing how were multiple coded.

Third, our readings also indicated evidence of *strategic knowledge*, not bound to a particular domain, that enabled children to accomplish their communicative goals (Paris et al., 1983). We found evidence, for example, of self-monitoring behaviors such as requests for

help, self-correcting, or correcting others as children as-
sumed specific literacy roles (like a postal worker) and
practiced routines. Since learners tend to be strategic
only when they need to be (Garner, 1990), coding in this
analysis consisted of marking those literacy-related
speech or gestural units (e.g., mailing a letter) reflecting
some type of monitoring device and placing them in ap-
propriate categories. In one interaction, Lisa's attempt to
be a postal worker was corrected by Sebastian, who said
"Uuh, I'm not that guy [the postal worker]—see, you're
that guy." Other types of self-monitoring behaviors, as
well, were recorded throughout the data.

Last, we categorized declarative and procedural
knowledge according to the purposes for literacy in each
activity. Here, categories were induced from the data re-
flecting *why* writing and reading were used on a contin-
uum of literacy purposes. Each episode was coded by
marking chunks of discourse reflecting a literacy pur-
pose. Strategies were then cross-referenced with literacy
purposes to examine why and how literacy was used in
each setting.

Coding consisted of marking each literacy-related
speech or gestural unit (e.g., mailing a letter) holistically
for gist and placing it in an appropriate category.
Corsaro (1979) found that this approach yielded an accu-
rate measure of behavior for preschool children. Non-
literacy-related talk, such as "I'm a monster and I'm
going to eat you up," within the context of these
episodes was not coded for this analysis.

Selected transcripts were coded by both of us to
establish and refine coding categories. The validity of
categories and examples was then established by asking
an external coder, a graduate research assistant trained
in early childhood observation, to code a number of
transcripts according to these definitions. In addition, we
asked her to examine transcripts for potential behaviors
that might not be included in our coding system. This
validation procedure served as a check on whether we
had adequately captured the literacy behaviors in con-
text and whether the examples we selected represented
the same behaviors to someone not involved with data
collection. Following discussions and modifications, tran-
scripts were coded by one of us, then reviewed by the
other, to ensure consistency of coded categories. Dis-
agreements were resolved by reviewing videotape
episodes and observational notations (see Appendix for
a coded transcript).

We conducted three levels of analyses. Our first
analysis was designed to broadly describe the key fea-
tures of literacy in practice across the three settings. The
second analysis examines types of knowledge displayed
in practice, focusing on domain-specific and strategic be-
haviors. And the final analysis describes the relation be-

tween domain-specific and strategic activity in literacy in
practice.

Results

Features of literacy in practice

Viewing literacy as an activity spanning the roles of
person and context, the first analysis examined critical
features of literacy in practice, providing a framework for
why and how writing and reading were used in authen-
tic activity. Five features of literacy in practice through-
out the 76 episodes were identified and described.

Presence of other people. Activities in these settings
involved children in collaboration with others to solve
problems. In some episodes, children engaged in paral-
lel activities, with each child carrying on concurrent ac-
tivity, while in others there was more social interaction;
however, virtually all episodes involved group problem
solving of one kind or another. In the presence of others
children tested their solutions, shared their expertise,
and assisted one another's performance. For example,
playing post office, Matthew asked his friend, "Hey,
man, could you get me an enn..., an ennnn...." "An en-
velope?" Joey replied. "Yup, and make it a big one." All
76 episodes involved children engaging with others in
literacy activity (see Table 3).

Feedback from others. Related to the presence of
others, children received feedback in the context of
these activities, allowing them to quickly adjust their ac-
tions to meet the demands of the situation. A typical ex-
ample follows in the post office setting.

> Kara and Lisa are side by side in the post office, near the
> cash register.
> Kara: Lisa, if you want something, you have to give us
>   money.
> Lisa: OK [and begins to write on the money].
> Kara: Lisa, you don't write on money.
> Lisa: I need something [and starts putting stickers on the
>   money].
> Kara: Lisa, you don't put stickers on money.
> Lisa: I know.

Feedback in these situations was frequent, immedi-
ate, and often subtle (e.g., the nod of a head). It came in
many forms—correcting, modeling, demonstrating, and,
in some cases, even instructing. Regardless of its form,
however, feedback appeared to provide tracking infor-
mation, which would then be used by the child or chil-
dren to regulate the next phase of activity.

Access to tools and related supplies. Children's com-
munication and collaborative activities involved the use

Table 4 Children's declarative knowledge about literacy in play

Category	Description	Examples
Roles of individuals common to the setting		
Post office	cashier, postal officer, customer, package handler, letter writer	"I'm the mailman. You're supposed to write a letter and give it to me."
Restaurant	customer, waiter/waitress, chef, restaurant owner	"Want to be the waiter?" says Joey. "No, I want to be the chef," says Justin. "Well, who's going to be the customer?"
Doctor's office	Doctor, nurse, receptionist, patient	"Hey, where's the doctor's place?" asks Analisa. Joey says, "I'm a doctor. She very sick?"
Implicit knowledge about setting		
Post office	Busy mail officers, importance of mail and money transactions, importance of writing correctly	"This is your package. That will be five dollars, five dollars," says Cindy. "OK, here's the box," says Johnny. "No, no, you got to write carefully on it."
Restaurant	Testy waiters, impatient customers, inappropriate customer behavior	Joann yells to Lisa, "Stop stuffing that pizza in your purse, or you'll never come back to this restaurant."
Doctor's office	Authoritarian doctor, docile patient, assisting nurse responding to doctor's orders.	Christine, with stethoscope around neck and pad and paper, "Nurse, check this baby because her weight is low."
Names and functions of literacy objects		
Post office	stamps, envelopes, pencil, letter, dollars, money, mailbox, color names	Johnny says to Lisa, "We have no dollars." Lisa answers, "You mean no moneys?"
Restaurant	Food names, menu, bill, check	Cindy (pointing to the picture on the menu) says to the waitress, "I'd like a BLT."
Doctor's office	Pills, scale, blood pressure, insurance card, eye chart, credit cards	"Lisa, we need all your credit cards. Give me your Blue Cross one, too."

of literacy objects and tools (e.g., paper, pencils, menus). From a Gibsonian perspective (Gibson, 1979), these objects appeared to afford opportunities to explore routines and to suggest certain activities. For example, children used pens, stationery, and a mailbox to write and send letters, menus to read and order selections from the restaurant, and eye charts to examine a patient's eyesight in the doctor's office. In fact, when accessibility to objects became unavailable, activities would be curtailed. For example, Colleen asked, "Can I have a stamp, please?" "There's no more," Cindy replied, and Colleen answered, "Now I can't write a letter for my mother, my father, and my brother."

Multiple options for activity. Although settings certainly imposed frames of reference that activated particular scripts (e.g., ordering from a menu, buying stamps), there were multiple options for activities within them. In fact, literacy often served the function of deciding between many options (e.g., menu selection, form of payment, shopping needs). Settings provided a familiar framework for activity that invited children to form goals—intentions—and to execute them in a series of ac-

tion sequences. In this respect, children were able to create, invent, and innovate flexible solutions in problem-solving situations, like in the following scenario.

> Christine, Lisa, and a parent are in the doctor's office.
>
> Christine: (to the parent patient) I need your card. You can use your Blue Cross/Blue Shield card. (to Lisa) I need to print your card too, [grabs a card from Lisa]. Medical, I need it. I'll give you back your card next week.
>
> Parent: You won't give me back my card? Why not?
>
> Christine: 'Cause you have too much blood of the shot we just gave you. When you come back, the blood will go away....
>
> Parent: So when the blood goes away, I can get my medical card back?
>
> Christine: Yes, that's right [writes on her chart].

Problem-solving situations. Applied to a varied and open set of options, literacy activity in these contexts was in the service of action. Reading and/or writing occurred within situations and was engaged in for reasons

Table 5   Children's procedural knowledge of how to use literacy in play activities

Setting	Common routines	Examples
Post office	How to get stamps How to put together a letter How/where to mail a letter How to address a letter How to deliver mail	Matthew says to Colleen, "How do you put this [letter] in [the envelope?" "You have to wrap it up. See, it's too big." [She folds it in three parts, puts it in envelope, and licks the envelope.]

Restaurant	How to take an order
	How to order from the menu
	How to pay for food
	   Look at bill, review items,
	   give money, get change,
	   leave tip, exchange pleasantries
	How to take inventory
		To customer, Michael asks, "What do
		you want? [looking at the
		menu.] Egg? [to the other
		customer.] And what do you want?
		You want what he gets?" "Yes,"
		Johnny says. Michael yells, "Oh
		Chef, I want eggs. Fried eggs."

Doctor's office	How to take down information
	How to give prescriptions
	How to sign in
	How to get pulse, weight
	How to give an eye test
	How to pay for services
	How to describe emergency
	   procedures
	How to give assignments to
	   others
	How to get referrals from other
	   doctors
		To parent, Kara says, "Now look at the
		eye chart and read the letters"
		[coaching parent]. The parent says,
		"A-E-E." Kara says, "Now try
		it again." "Did I make a mistake?"
		the parent asks. "Just read the
		chart again. You did very good."

other than literacy itself. Whether children were writing prescriptions, sending letters, or communicating with loved ones, literacy served as an integral aspect of practical activity. Thus, rather than a set of skills that was the same everywhere at all times, reading and writing demonstrations were adapted to the nature of the activity. For example, children's writing, slow and laborious when addressing a letter in the post office setting, was cryptic in the restaurant where fast service was a necessity. Varying tasks posed different problems and novel solutions, requiring dynamic adaptations and transformations of literacy in context.

Literacy in practice as defined by these five features, therefore, was not a primary focus nor an individual matter. Rather, mediating other meaningful activity, the cultural tools and artifacts of literacy were explored and exploited by children as they set about to purposefully participate in their social world.

Literacy knowledge in practice

Within these contexts of participation, our second analysis examined the types of knowledge displayed in practice. Our analysis revealed a rich storehouse of literacy knowledge: Children's activities in authentic play contexts were embedded with domain-specific declarative and procedural knowledge as well as non–domain-specific strategic knowledge of literacy.

Declarative and procedural knowledge. As shown in the typology in Table 4, children's *declarative knowledge* illustrated understandings about individuals and their roles in familiar literacy-related contexts (mail carriers, waiters, doctors, nurses) as well as implicitly held understandings of the ways these individuals functioned in their roles. In the following episode, for example, Christine demonstrates not only explicit, but also implicit, knowledge of the authority role of the doctor.

Christine: [with a clipboard and pen] to Kara (the patient) We need...we have to have you take these pills. (declarative) [whispers to Colleen who is acting like a nurse and following Christine with pencil and pad] 14-45-14. (declarative; procedural)

Christine: OK..And 45-45-45 (declarative) [to the girls at the reception desk who are keeping the patient's chart]. (procedural)

Christine: (to the patient) And you gotta take these pills.... Don't drink juice or ginger ale or coke with 'em. (declarative)

Kara: Just water?

Christine: Yeah, or tea. Something that will agree. Remember, take this pill with milk, this one with tea, and this one with water. (declarative) [then to Colleen who is writing this down] 72-22-79. (declarative; procedural)

The doctor's role is defined by the activity (dispensing medicine and providing clear directions) and the tone of the interaction; here, Christine uses the repetition of random numbers spoken to her assistants (who carefully write them down), implicitly conveying her understanding of the doctor's authority role over others. As noted in Table 4, such explicit and implicit understandings of literacy-related roles (postal officers, waiters, receptionists) were common in each setting.

Further, as noted in the example above, the names of common literacy objects and their functions were also integrally tied to practical action in these settings. Literacy objects like envelopes, menus, checks, credit cards, and eye charts were identified and described in the course of a play activity. For example, replying patiently to Johnny's inquiry about a literacy object, mail officer Mary Kate reminded him that "They're stamps. You put them on this [envelope]. Stickers doesn't look like this." Interactions like these indicated domain-specific knowledge about the labels and the structures of common literacy-related activities in these everyday settings.

Setting-specific procedural knowledge indicated children's understanding of the actions and behaviors associated with literacy tasks. Routines, or subroutines of more extended tasks, illustrated *how to* perform literacy-like activities. As shown in Table 5, they reflected a conceptual understanding of how to use literacy to carry out everyday activities for organizing, sharing, and transactive purposes—getting, giving, and writing down important information and conveying information to others. In the family restaurant, for example, the large menu in the setting served as the informational resource for ordering, as Joey pretends to be a waiter:

Joey: (to the customer) What do you want? [looking at the menu and pointing] This or that or that or that. Eggs? (procedural)

Michael: I want eggs. I want my eggs. Fried eggs. [Joey writes this down.] Two more eggs. (declarative) [Joey continues to write.] (procedural)

[Joey hands the customer a check.] (procedural)

Michael: Here, here. Hey, wake up here [and gives him the money]. (declarative; procedural)

Often resembling imitations of adult behavior, these routines tended to have a character all their own. Children practiced, tried to perfect, and slightly varied situationally specific routines in striking detail. For example, literacy-related subroutines recorded in the doctor's office play setting included signing in, taking information and documenting a patient's vital signs, describing emergency procedures using a chart, giving prescriptions, get-

Table 6 Number and percentage of behavioral units for knowledge category by setting

Type	Setting					
	Post office		Restaurant		Doctor's office	
	No.	%	No.	%	No.	%
Declarative knowledge (knowing that)	62	25%	59	33%	54	31%
Procedural knowledge (knowing how)	75	30%	101	56%	69	40%
Total number of domain-specific knowledge units	137		160		123	

ting referrals from other doctors, giving assignments to nurses, and paying for services with money, insurance, or credit cards. These data reveal a wide range of setting-specific knowledge involving how to execute various literacy actions in these contextualized settings.

Table 6 describes the number and percentage of behavioral units for each knowledge category in these activities. Reflecting Bruner's (1972) thesis that actions, or know how, precede verbal knowledge, or know that, these data indicate that observations of procedural knowledge were recorded more frequently than declarative knowledge. Consequently, it was children's actions and routines, even more than their verbal capacity, that gave evidence of the considerable literacy-related knowledge they brought to bear in the course of their playful activities.

Strategic knowledge of literacy. Practical problems often required children to monitor the success of their understandings by seeking information and by checking them against their own existing hypotheses. Unlike domain-specific declarative and procedural knowledge, however, these metacognitive behaviors, defined here as *strategic knowledge*, included self-monitoring devices that were employed across settings. Six types of strategies were identified: (a) seeking information, (b) correcting, (c) self-correcting, (d) assigning roles and resources, (e) checking, and (f) gathering resources (see Table 7 for definitions).

Self-monitoring was evident in Sebastian and Brian's play in the post office, for example:

Sebastian: (to everyone) Hey, come here, the post office is open. (declarative)

Brian: No, it's closed. I think it's closed [points to the sign that says *closed*]. (declarative)

Sebastian: It's not closed, right? (checking)

Table 7   Definitions and examples of strategies in episodes

Definition	Example
Seeking information Requesting help, a question	Mary Kate, playing post officer, asks, "What is this, Johnny?" [holding stamps]
Correcting Giving feedback to others	Cindy, responding to Colleen who is putting money in an envelope, says "You can't send money in the mail."
Self-correcting Correcting self in a in the process of completing a task	Lisa, after putting a letter in the cash register, says, "Oops, that doesn't go there."
Assigning roles and resources Suggesting a role and describing objects that specify activity in the role	Christine, in the restaurant, asks her friend, "Want to go to the restaurant with us? I'll give you some clothes" [gets dress, shoes, and purse].
Checking Examining or checking specific behaviors against some standard.	Writing letters together in the post office, Natasha, showing Christine her work, asks, "Is this the way you make an O?"
Gathering resources Gathering relevant literacy materials before beginning a task.	Kara runs up to the teacher in the post office, saying, "We don't have any more stamps. We need more stamps to mail our letters."

Brian:	Yes, because this is closed [the sign—points to it]. (declarative)
Sebastian:	Yes, it says I am closed. (self-correcting)
Brian:	(looking at the sign) Yeah. (declarative)
Sebastian:	You read it? (checking)
Brian:	Closed, c-l-o-s-e-d. (declarative)
Sebastian:	I'll put an open sign up and then you read it. (assigning resources) When it gets dark we'll put on closed. (declarative) [Pauses, looks at the open sign] P-O-M open. It says open. (declarative)

As noted in this example and others, children sought from one another information, resources, and feedback to resolve ambiguities, formulate new solutions, and direct future communicative efforts.

Examining frequencies of behavioral units in strategic activity, Table 8 reveals that higher frequencies of strategic behaviors were recorded in the post office setting (where declarative and procedural knowledge were lower) than in the other two settings. This suggests that strategic behaviors may have been used as tools for knowledge generation. As shown in Table 8, the social interactive devices of seeking information and assigning roles and resources were used most frequently in two of the three settings, followed by correcting, gathering resources, and checking information with peers. Self-correcting was least common among the strategic behaviors documented. Activities in these everyday settings,

therefore, seemed to naturally provide opportunities for children to use strategies to examine, reexamine, and solve problems together.

Thus, in the context of activity in these three settings it was evident that children brought setting-specific declarative and considerable procedural knowledge to bear to these literacy-related tasks. Further, they intentionally applied a variety of strategies to generate new information and to solve practical problems. Throughout their activity, 3- and 4-year-old children displayed and pursued new knowledge about how things worked, using literacy as a tool to serve their communicative needs.

Domain-specific and strategic knowledge in practice

Our final analysis examined the interaction of literacy-related domain-specific and strategic knowledge in practice. Specifically, we asked how and when strategies were used for knowledge generation. To conduct this analysis, we first categorized declarative and procedural knowledge routines in six domains reflecting their communicative purpose. These domains included: (a) sharing information, (b) making transactions, (c) authenticating information, (d) remembering, (e) making choices, and (f) organizing activity (see Table 9 for definitions and examples).

For example, literacy routines, like paying for stamps, insurance, or credit cards, were categorized as making transactions; taking orders, writing down vital

Table 8 Distribution of strategies in episodes: Percentage (and number) of units in each setting

Behavioral units	Setting		
	Post office	Restaurant	Doctor's office
Seeking information	24% (36)	25% (13)	45% (20)
Correcting	20% (30)	13% (7)	14% (6)
Self-correcting	5% (7)	2% (1)	5% (2)
Assigning roles and resources	20% (29)	30% (15)	0% (0)
Checking	11% (16)	4% (2)	22% (10)
Gathering resources	20% (30)	26% (13)	14% (6)
Total percent	100	100	100
Total number of strategies	148	50	44

Table 9 Definitions and examples of purposes for writing and reading

Purpose for writing and reading	Example

Sharing information
   Literacy was used as a communications
   tool, to explain one's actions, to interact
   with others, to teach a literacy routine
	"Lisa, I'll show you how to write an *a*—watch me."

Making transactions
   Literacy was used to conduct business
   transactions
	Sara exclaims, "I need money money, so I can buy, buy, buy."

Authenticating information
   Literacy was used as a legitimating device,
   to document events/observations,
   or to verify decisions
	"Don't come in 'cause we're closed. You see what the sign says."

Remembering
   Literacy was used as a memory device,
   to take down an order, to remember
   directions
	"Excuse me, I have to write down something so I won't forget."

Making choices
   Literacy was used to make decisions
   or to demonstrate preferences
	Looking at menu, Cindy says, "Mmm, I'll have some ice cream."

Organizing activity
   Literacy was used to arrange or allocate
   materials and assign various roles
	"You get the envelope, and I'll get the paper, and we'll make a letter."

Figure 2   Purposes for using strategies in post office setting

Post office setting

Number of behavioral units
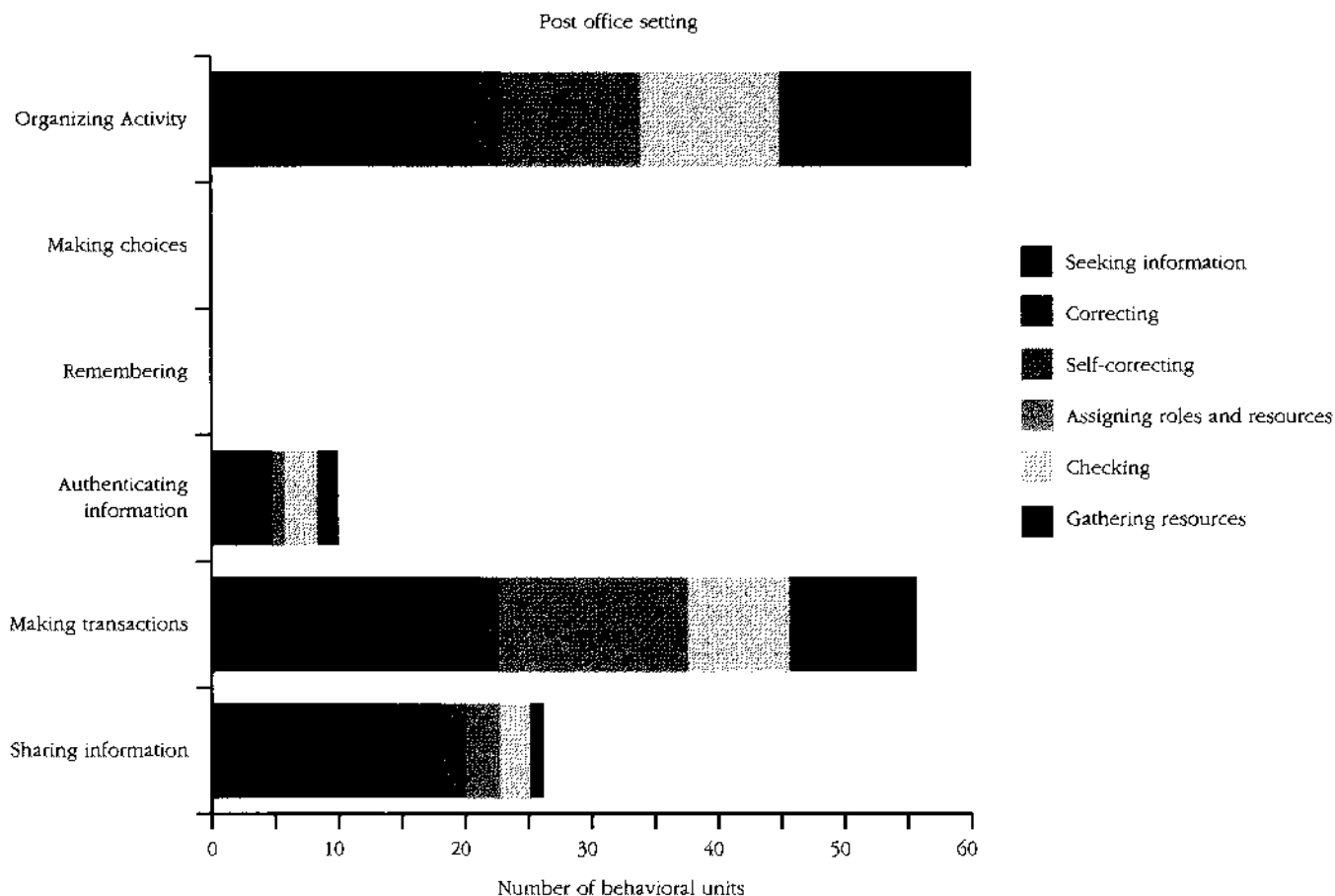
signs, and making lists were categorized as remembering. We then cross-referenced literacy purposes with strategies employed for each setting. Figures 2–4 describe each setting.

As illustrated in these Figures, patterns and purposes varied dramatically across settings. In the post office setting as shown in Figure 2, for example, strategies were invoked most frequently to organize activity and to conduct transactions. Both purposes seemed to involve some level of difficulty and detail for translating what children knew about literacy into action, provoking them to frequently engage in requesting information and correcting one another as well as arranging and gathering literacy resources. At the cash register in the setting, for example, Sebastian checks and is corrected by Mary Kate in a typical transaction routine.

Sebastian and Mary Kate at the cash register.

Sebastian: (to Mary Kate) Put on the price 269293 for those stamps. (declarative) Oops, I'm the

guy who does that, right? [the cashier] (self-correcting). I can do that, right? [looks at Mary Kate] Because I'm the guy, I'm supposed to do it. (checking)
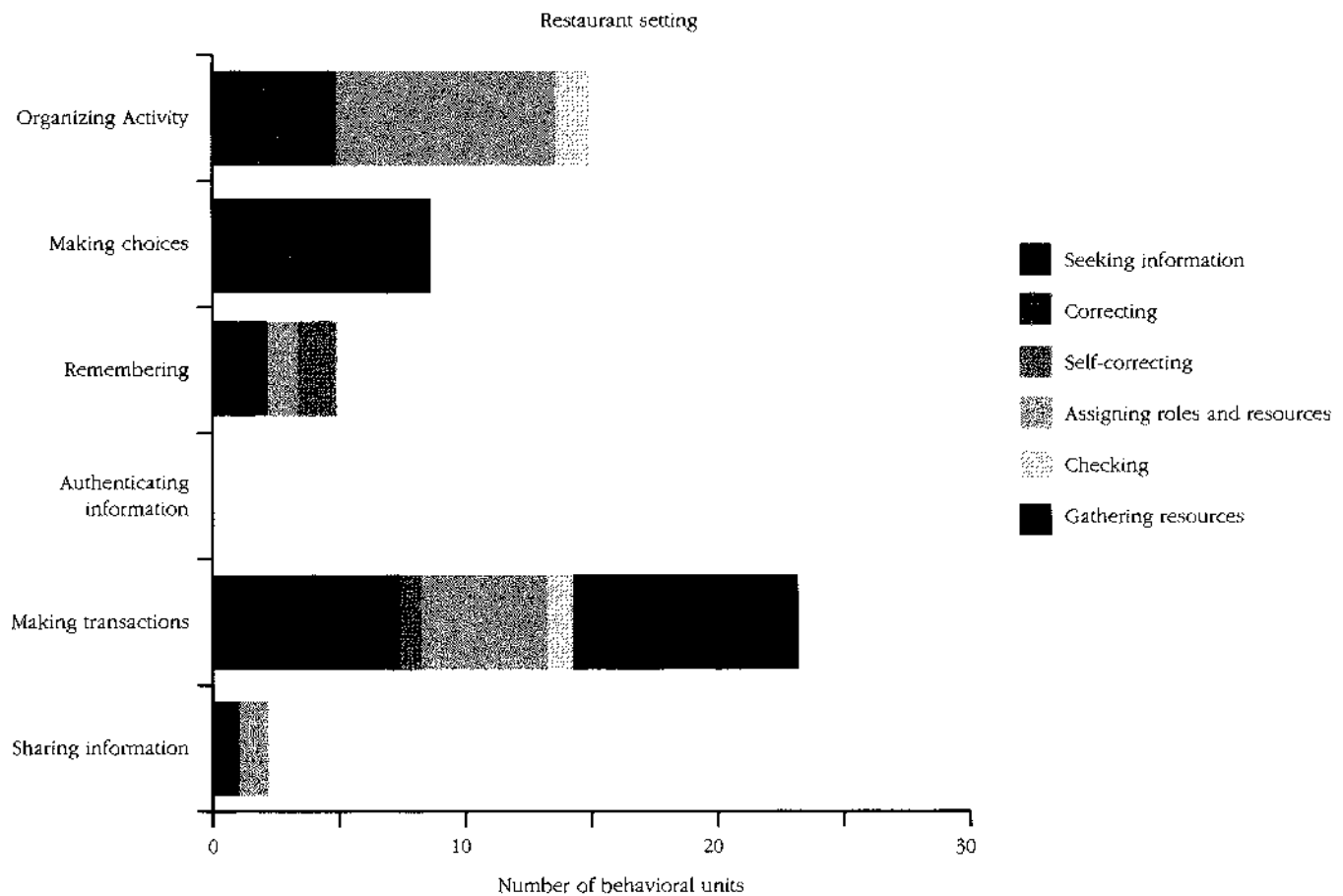
Mary Kate: [nods] (correcting)

Sebastian: This is three dollars, right? (checking). What's a letter? (seeking information)

Mary Kate: That's how much for a letter [shows him]. (correcting)

Sebastian: A letter is three dollars? (checking)

Mary Kate: A letter is one dollar. (correcting)

Greater frequencies of strategic activity for transacting and organizing purposes were also recorded in the restaurant setting in Figure 3. Like the post office, children in this setting repeatedly practiced these situationally specific routines, calling upon a slightly different series of monitoring devices than in the post office setting

Figure 3 Purposes for using strategies in restaurant setting

Restaurant setting

Number of behavioral units

Legend:
- Seeking information
- Correcting
- Self-correcting
- Assigning roles and resources
- Checking
- Gathering resources

to correct and check information with their peers. For example:
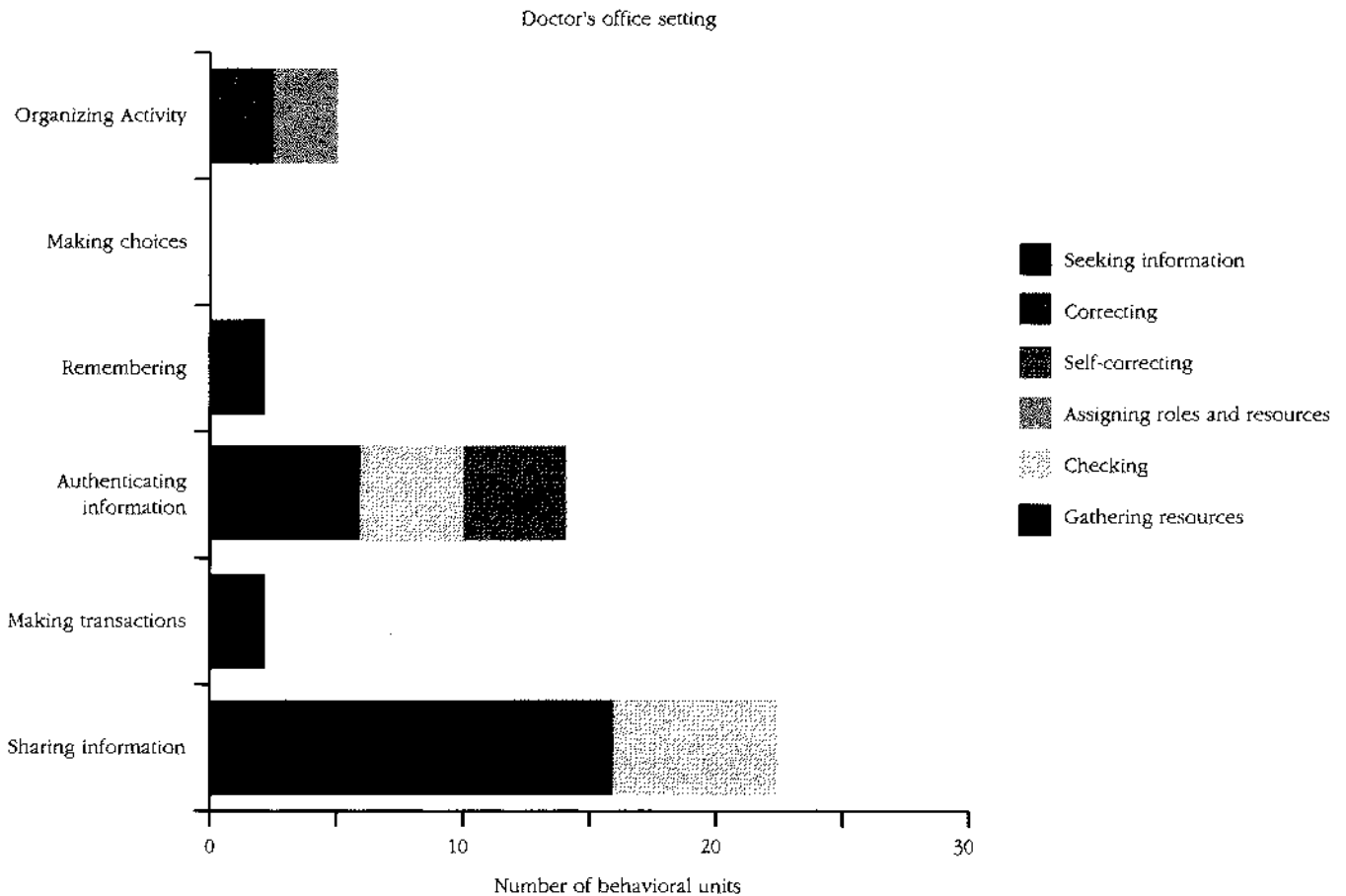
Cindy:	[pretending to be a waitress] You have to pay for your food. (declarative) [looks] Oooo, you have no money. (checking)
Jason:	I don't care. So who cares? (correcting)
Cindy:	[goes over to her friends] What do we do? The customer is not paying money. (seeking information) [They bring him a hamburger anyway.]
Jason:	Thank you [pretends to eat]. (procedural)
Cindy:	Give me one dollar, five dollars. (gathering resources)
Jason:	Here's some [gives her a credit card]. (assigning resources)

Routines such as these seemed to elicit inventive heuristics (Brown et al., 1989)—strategies to assist chil-

dren in refining a procedural skill (in this case paying for food). Less complex or more automated routines, on the other hand, appeared to make strategic behaviors unnecessary. In these episodes, children seemed to monitor their activity less rigorously than when acting out specific literacy-related routines. For example, ordering food in the restaurant for children typically involved a routine, like "Whatta ya want?" "I'll have pizza," rarely involving strategy use.

On the other hand, there was less evidence of strategic behaviors in situations that were less familiar to young children. As shown in Figure 4, for example, although literacy was used primarily for authenticating and sharing purposes, these activities seemed to involve a knowledge base that many of these young novices did not have; thus, they seldom called upon strategic behaviors. For example:

Analisa: Where's the doctor's place? [She's holding a pencil and a pad.] (seeking information)

Figure 4 Purposes for using strategies in doctor's office setting

Doctor's office setting

Number of behavioral units

Legend: Seeking information, Correcting, Self-correcting, Assigning roles and resources, Checking, Gathering resources

---

Joey: I'm the doctor. (declarative) [talks on the phone]

Analisa: [plays with the baby]

Joey: [Holds the clipboard and quietly talks to himself]

Unlike cases in which a basic procedure was known, children did not appear to assess or seek verification from others against an existing model.

Strategic behaviors, therefore, appeared to be used to refine procedural routines that were neither too automatic nor too complex. Certain settings, like the post office, seemed to elicit greater strategy use than others, like the doctor's office. Further, certain types of literacy purposes were more likely to elicit a variety of strategies than others. For example, strategies to use literacy for transactions and for organizing activity were recorded more frequently in the post office and the restaurant than were other types. Different settings, therefore, provided children with different opportunities for using literacy to explore the physical and social resources of their environment.

This analysis of activities indicated the variable and dynamic nature of literacy for these 3- and 4-year-old children. In these settings the occasions and conditions for use arose out of the context of activity, resulting in a unique pattern of strategic behavior and purposes applied to each setting. In contexts of participation, young children adapted their uses of literacy to meet the demands of different situations, thus extending and enriching their knowledge of the multifaceted nature of literacy.

Discussion

Reading and writing are embedded in the everyday lives of young children, closely tied to specific relationships and specific contexts (Teale & Sulzby, 1986). Through participating in activities that require cognitive and communicative functions, children are drawn into the uses of these functions by their caregivers in ways that may nurture and develop them. Consequently, chil-

dren's earliest conceptions of literacy and strategies for reading and writing are likely to be formed through socially mediated activity.

Much of what is transmitted about literacy will be tacit and context specific, however. What is learned by children through these apprenticing situations, as is true of many other special skills, will likely be practiced in playful activity (Bruner, 1972). And it is within this context of purposeful, pressure-free play in familiar environments that children may best display and extend their knowledge about literacy and how it may function in their worlds (Fantuzzo et al., 1995).

Our study focused on how literacy was practiced in the context of activity. From the sociocultural theories of Vygotsky (1978) and Leont'ev (1981), cognition is an activity spanning the roles of person and context. Consistent with this approach, we examined the literacy practices as they were embedded in activity, focusing on dynamic processes rather than underlying abilities of individuals. In emphasizing the centrality of activity, we sought to highlight the context-dependent, situated, and enculturated nature of literacy learning for emergent learners, and how the context might support their uses of these cognitive tools in authentic domain activity.

This study examined key features of contexts that supported literacy in practice activities. These features included the presence of other people, feedback from others, access to literacy tools, multiple options for activity, and purposeful situations other than literacy learning itself. Of course, these contexts only approximated authentic, everyday settings because it would be impractical for preschool or elementary schools to create true apprenticeship sites. Still, even in these simulated settings, activity was performed in the context of some shared task that was distributed across people and applied for specific purposes. In sharp contrast to skill-based instructional settings in which children are expected to learn and perform individually independent of props, or purpose (Resnick, 1989), literacy activities engaged children in processes of meaning construction tied to their actual use.

We would argue that these contexts produced physical and social support systems for activating children's knowledge and strategies. Familiar settings, authentic objects, and other people provided children with accessible representations, needed knowledge, and materials (e.g., clipboard, pencil, and paper) to support their interactions with print. Lave and Wenger (1991) have argued that mental activity cannot be considered an individual activity, but one that stretches over persons, activities, and settings. The immediate physical and social resources outside the person are said to form a cognitive partnership, or what Perkins (1993) has described

as *person-plus-surround.* Thus, from an activity perspective, these contexts were not merely backdrops or external sources of stimulation; rather, they were critical vehicles of thought that shaped and helped to direct children's ongoing activities.

Our study indicated that in these contexts children engaged in a wide range of literacy practices. Using knowledge of their social and cultural worlds in situations that evoked familiar activity, children were able to call up appropriate context-sensitive rules and routines derived from their daily experiences. Three- and 4-year-olds adapted the tools of literacy for specific purposes and engaged in strategic behaviors in a variety of problem-solving situations, giving evidence of the rich repertoire of literacy knowledge and inventive heuristics they bring to these informal settings. These results strongly suggest that long before formal instruction, children use legitimate reading and writing behaviors as an integral part of their everyday lives.

Such knowledge of literacy purposes and strategic behaviors, embedded in practice, may have traditionally gone unnoticed in school contexts, however. Literacy demonstrations in their contextualized form reflected *knowing how,* or procedural knowledge, more than *knowing that,* or declarative knowledge. Even though procedural modes of transmitting knowledge have been considered to precipitate language growth (Bruner, 1972), literacy-related action sequences and routines as critical cognitive activity in literacy development have not been fully recognized in previous studies or measures of early literacy behavior. Yet, these literacy actions and routines in this study appeared to reveal an important form of domain-specific knowledge. These results, therefore, argue for a broader framework for interpreting young children's knowledge base about literacy and the learning processes that constitute its early development. As a legitimate form of early literacy, participation in writing and reading practices represents an important phase of literacy learning, engaging children in practicing not only what written language is for, but how it works.

Across these settings children used a variety of strategies to monitor their understandings. Until recently, it had been assumed that children younger than age 5 were incapable of such intentional behaviors (Brown & DeLoache, 1978; Gelman, 1978). Nevertheless, recent studies (DeLoache & Brown, 1987; Revelle, Wellman, & Karabenick, 1985; Rowe, 1994) have revealed that even preschoolers show signs of being intentional at the level of demonstrating an awareness of a goal and show an understanding that something should be done in order to reach that goal. Our study substantiates this research, suggesting that in familiar, supportive environments with

prompts or cues, children are capable of activating strategies in situations that *they* judge to be important and in which *they* are interested in the outcome and the goal.

Whether or not or to what extent strategic activities will be used, however, is likely to vary from setting to setting. In this study, children used strategies most often for transacting and organizing purposes as they attempted to refine and expand domain-specific knowledge. Fewer strategies were used in situations where literacy rules were either very well known or not known well enough. Confirming Garner's (1990) theory of settings, strategy use was strongly dependent on the context in which the activity occurred. Children adjusted their strategic activity according to the context of participation.

This research raises several important issues for engaging young literacy learners in more formal instruction. Much of what children learn about literacy before entering school is holistic, unintentional, and incidental (Iran-Nejad, McKeachie, & Berliner, 1990). Creating contexts in such a way that these dynamic learning approaches continue to work for children may represent a particularly important activity in early childhood classrooms.

In this study, for example, we orchestrated classroom settings to more closely approximate authentic learning opportunities in real-world contexts. In these contexts, we found children engaging in a variety of literacy purposes and strategies in rather complex and diverse literacy routines, reflecting approximations of literacy activity in everyday life. Exposed to the domain's conceptual tools in practical activity, these children appeared to adapt through the mechanism of acculturation some of the cultural practices and discourse patterns of literate learners. Such participation in practice applied to multiple settings, according to Hatano (1993), enhances the construction of mental models, enabling generalization of a multitude of literacy practices across various contexts. Participation in authentic activity, therefore, not only provides opportunity for using knowledge and strategies; it also represents critical cognitive work in literacy development.

Nevertheless, participation in practice as the major activity through which learning occurs may have its limitations. Enculturating learners by modeling authentic real-life practices does not suggest how print conventions and literacy skills are formed by young learners. For example, children's literacy actions and routines did not appear to significantly change or become more embellished over the 7-month period of the study. This could suggest, of course, only limited occasions for demonstrations of knowledge or lack of stimulating options within settings. Or it could reflect a limitation of our research. Because our study focused on children's activity and not teacher-child interactions, long-term ap-

prenticeship involving the teacher in an extended period of modeling, coaching, and fading (Collins et al., 1989) was not conducted; it might be that greater teacher participation could have encouraged more active knowledge construction. But it also could suggest that such activities do not support children's knowledge about literacy, apart from its functional uses. Situating literacy learning in authentic contexts, for example, cannot address how literacy is used to think and reason in a variety of other domains (Brown et al., 1993). Engaging children in authentic literacy practices, therefore, may represent an important form of learning, but only one form. Children need instruction that stimulates conceptual and factual knowledge about literacy.

Providing opportunities for both situated learning and formal school learning, therefore, could create dynamic and active classroom contexts for participation in literacy development. Classrooms like these provide both academic instruction and real-world opportunities for children to engage in literacy practices around self-initiated problem-solving situations, creating continuity between the rich contexts of home and school literacy practices. In this respect what children bring, in terms of their multiple literacy capabilities, would be used and practiced to manage complex activities, requiring them to adjust and strategically adapt their purposes for literacy in different situations. In these settings children may engage in such social practices as using literacy to remember, generalize, form concepts, operate with abstractions, and reason logically—activities identified with literate individuals. Such an approach might help children apply their multiple ways of knowing to novel problems, enculturating them into the community of literacy practitioners.

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APPENDIX
Sample of coded episode

Three-year-old Stephania, Analisa, and Lisa are in the post office. Lisa is protecting the cash register.

Stephania:	I need the money; this is mine. (gathering resources)
Analisa:	Why, I had to take the money. [from the cash register] (seeking information)

Stephania leaves, then returns in a minute.

Stephania:	Give me a pen, please. Where is the pen? Where is the pen? (gathering resources)
Analisa:	Is this the pen? [giving her an index card] (seeking information)
Stephania:	This is not a pen, it's a paper. [throws it, goes to get a pen] (correcting) This is a pen. (declarative) This is my pen. [starts writing] I'm going to put the dollar in there. [in an envelope] (procedural)
Analisa:	You have to pay for money. (declarative)
Stephania:	No, no. (correcting)
Analisa:	Give me the money. You have to share. [grabs it] (gathering resources)
Stephania:	No, I need these and you need these. [attempting to share] (assigning resources)
Analisa:	I need two dollars. (gathering resources)
Stephania:	And this is mine. This is mine. This is all my money, OK. [then gives it to Analisa] (gathering resources)