Growth of Literacy Engagement: Changes in Motivations and Strategies during Concept-Oriented Reading Instruction

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Growth of literacy engagement: Changes in motivations and strategies during concept-oriented reading instruction

The main goal of this article is to describe patterns of change in literacy engagement during conceptually oriented reading instruction. The first objective is to construct a theoretical framework for understanding the development of literacy engagement. By engagement we refer to the integration of motivations and strategies in literacy activities. In constructing the theoretical framework we integrate work from the fields of motivation, literacy, and cognitive strategies. Because these areas have not been well integrated in the reading field, we provide an extended description here.

The second purpose is instructional. We report a classroom context designed and implemented to promote literacy engagement. Generated collaboratively with teachers over a 2-year period, this context has been termed Concept-Oriented Reading Instruction (CORI). The essential dimensions of the instructional framework were induced from a variety of observational, interview, and videotape sources.

Our third objective is to describe patterns of change in motivation, strategy use, and conceptual learning capacity for students experiencing CORI. To portray motivational attributes and changes, we have used a multimethod, descriptive approach. We used a grounded theory approach to generate a set of motivational constructs and then developed quantifiable measures of them. To describe the strategic and conceptual aspects
Growth of literacy engagement: Changes in motivations and strategies during concept-oriented reading instruction

This study describes changes in literacy engagement during 1 year of Concept-Oriented Reading Instruction (CORI), a new approach to teaching reading, writing, and science. Literacy engagement was defined as the integration of intrinsic motivations, cognitive strategies, and conceptual learning from text. To promote literacy engagement in classrooms, our team designed and implemented CORI in two third- and two fifth-grade classrooms in two schools. One hundred and forty students participated in an integrated reading/language arts-science program, which emphasized real-world science observations, student self-direction, strategy instruction, collaborative learning, self-expression, and coherence of literacy learning experiences. Trade books replaced basal and science textbooks.

According to 1-week performance assessments in the fall and spring, students gained in the following higher order strategies: searching multiple texts, representing knowledge, transferring concepts, comprehending informational text, and interpreting narrative. Children's intrinsic motivations for literacy correlated with cognitive strategies at .8 for Grade 5 and .7 for Grade 3. All students who increased in intrinsic motivation also increased in their use of higher order strategies. A sizeable proportion (50%) of students who were stable or decreased in intrinsic motivation failed to progress in higher order strategies. These findings were discussed in terms of a general framework that embraces motivational, strategic, and conceptual aspects of literacy engagement.

Crecimiento del compromiso con la lectoescritura: Cambios en las motivaciones y estrategias durante la enseñanza de la lectura orientada hacia los conceptos

Este estudio describe cambios en el compromiso con la lectoescritura durante un año de enseñanza de la lectura orientada hacia los conceptos (CORI), un nuevo enfoque de la didáctica de la lectura, la escritura y la ciencia. El compromiso con la lectoescritura se definió como la integración de motivaciones intrínsecas, estrategias cognitivas y aprendizaje conceptual de los textos. Para promover el compromiso con la lectoescritura en las aulas, nuestro equipo diseñó e implementó CORI en dos clases de tercer grado y dos de quinto en dos escuelas. Ciento cuarenta estudiantes participaron en un programa integrado de lectura, lenguaje y ciencia, que ponía el acento en observaciones científicas en el mundo real, estudio autodirigido, enseñanza de estrategias, aprendizaje en colaboración, autoexpresión y coherencia de las experiencias de aprendizaje de la lectoescritura. Libros de circulación general reemplazaron a los textos básicos (basals) y a los libros de texto sobre ciencias. Sobre la base de evaluaciones del desempeño durante una semana tomadas en otoño y primavera, los estudiantes hicieron avances en las siguientes estrategias de orden superior: búsqueda de textos múltiples, representación del conocimiento, transferencia de conceptos, comprensión de texto informativo e interpretación de narrativas. Las motivaciones intrínsecas de los niños hacia la lectoescritura correlacionaron con las estrategias cognitivas en .8 para 5º grado y .7 para 3º grado. Todos los estudiantes que aumentaron su motivación intrínseca también aumentaron el uso de estrategias de orden superior. Una importante proporción (50%) de estudiantes, que permanecieron estables o cuya motivación intrínseca disminuyó, no progresó en las estrategias de orden superior. Estos hallazgos fueron discutidos dentro de un marco conceptual que incluye aspectos motivacionales, estratégicos y conceptuales del compromiso con la lectoescritura.

Wachsendes Engagement in der Literarisierung: Veränderungen in den Lern-Motivationen und Lernstrategien durch einen konzeptorientierten Unterricht

Les progrès dans l’investissement en lecture-écriture: les changements de motivations et de stratégies pendant un Enseignement de la Lecture Orienté vers les Concepts

Cette étude présente les changements de motivations au cours d’une année d’enseignement de la lecture orientée vers les concepts (ELOC; CORI en anglais), une nouvelle façon d’enseigner la lecture, l’écriture et les sciences. On a défini l’investissement en lecture-écriture comme une intégration de motivations personnelles, de stratégies cognitives, et d’apprentissages conceptuels à partir d’un texte. Notre équipe a défini et implanté CORI dans deux classes de troisième année et dans deux classes de cinquième année de deux écoles en vue de développer l’investissement en lecture-écriture en classe. Cent quarante élèves ont participé à un programme de lecture-langue-sciences, qui mettait l’accent sur des observations scientifiques du monde réel, l’autonomie de l’élève, l’enseignement de stratégies, l’apprentissage coopératif, l’expression de soi, et la cohérence des expériences d’apprentissage de la lecture-écriture. Des livres du commerce ont pris la place des manuels et des livres d’exercices scientifiques. En se basant sur les résultats d’une semaine d’évaluations au premier et au second trimestre, on voit que les élèves ont progressé dans les stratégies de haut niveau suivantes: recherche dans plusieurs textes, représentation des connaissances, et interprétation de narration. Les motivations personnelles des enfants pour la lecture-écriture sont en corrélation avec les stratégies cognitives à 80% en cinquième année et à 70% en troisième année. Tous les élèves dont les motivations personnelles ont progressé ont également progressé dans leur utilisation de stratégies de haut niveau. Une proportion notable (50%) d’élèves dont les motivations personnelles sont stables ou en diminution n’ont pas progressé dans les stratégies de haut niveau. La discussion de ces résultats porte sur un cadre conceptuel embrassant les aspects motivationnels, stratégiques, et conceptuels de l’investissement en lecture-écriture.
of literacy engagement, we built a coding rubric that characterized the quality of children’s performance in a performance assessment. This rubric enabled us to quantify our grounded categories of strategic and conceptual learning. We have used this multimethod descriptive approach to enhance the explanatory coherence (Thagard, 1989) of our account of changes in literacy engagement. This descriptive study, in other words, is a deliberate combination of qualitative and quantitative methods to address our objectives.

**Theoretical framework for reading engagement**

**Motivations for reading**

Central to our investigation is the construct of **reading engagement**, which refers to the joint functioning of motivations and strategies during reading (Newman, Wehlage, & Lamborn, 1992). Engaged readers choose to read for a variety of purposes and comprehend the materials within the context of the situation. Engaged readers are self-determining (Deci, Vallerand, Pelletier, & Ryan, 1991) in the sense that they elect a wide range of literacy activities for aesthetic enjoyment, gaining knowledge, and interacting with friends. They are motivated to read for its own sake, and these motivations activate the self-regulation of higher order strategies for learning through literacy (Dole, Duffy, Roehler, & Pearson, 1991).

In our engagement perspective, motivations for reading are seen as internalized goals that lead to literacy choices and comprehension strategies (Pintrich & Schrauben, 1992). In this goal-oriented view, motivations may be regarded as reasons for reading. Students’ goals can be classified as intrinsic or extrinsic. **Intrinsic motivation** refers to the activities in which pleasure is inherent in the activity itself (Gottfried, 1985). Students who are intrinsically motivated have an inherent interest in what they are reading and enjoy figuring out the meanings for themselves. When asked the question “Why are you reading this text?”, students who are intrinsically motivated to read answer “to learn how butterflies migrate” (curiosity goal) or “because the mystery was so exciting” (involvement). The motivational goals of curiosity and involvement are intrinsic.

**Extrinsic motivation** refers to motivation that comes from outside the learner. Students who are more extrinsically motivated prefer to please the teacher, do easier reading tasks, and are dependent on the guidance of others. Thus, when asked the question “Why are you reading this text?”, extrinsically motivated students might answer “because the teacher assigned it” (compliance) or “because I wanted to get a sticker” (recognition).

Some researchers (e.g., Harter, Whitesell, & Kowalski, 1992) proposed that motivations fall on a **continuum from intrinsic to extrinsic** implying that they are negatively correlated. Other investigators such as Wentzel (1991) reported that students may possess multiple motivational goals simultaneously—some of which are intrinsic and some extrinsic. We believe students have multiple goals for reading.

Further, children’s motivations have been reported to be **domain-specific** (Wigfield & Harold, 1992). Students may be intrinsically motivated to read but not to do math and vice versa. Gottfried (1985) found that intrinsic motivations for reading predicted students’ perceptions of their own competence in reading, but intrinsic motivation in reading did not predict perceptions of competence in math or science. Relationships among motivationally oriented constructs are specific to particular content areas.

Within reading, further distinctions among types of motivations can be made. The diversity of motivations for reading has been described by Wigfield and Guthrie (1995) with a combination of methods including open-ended interviews and factor analysis of self-report data from student questionnaires. They reported clear distinctions among several intrinsic motivations including curiosity, aesthetic involvement, importance of reading, challenge, social interaction, and self-efficacy.

In addition, several more extrinsic motivations such as recognition, grades, competition, compliance, and work-avoidance were identified. Describing how these different types of motivational goals influence reading strategies is the topic of the next section.

**Motivations for strategy use in reading**

Relationships between motivations and strategies have been explicated by Corno and Kanfer (1993), Covington (1992), and Ford (1992). Corno and Kanfer (1993) asserted that motivations consist of goals and intentions; however, they also emphasized the importance of volitional strategies that enable individuals to fulfill their motivational goals. They argued that without volition, individuals’ intentions may not be realized in action.

Following Kuhl (1985), Corno and Kanfer (1993) discussed many volitional processes. These included, first, action control processes, which empower the individual to manage cognitive and metacognitive resources for goal attainment. Second, goal-related cognitions form the basis for adaptive use of learning strategies, well-timed application of deep processing, self-monitoring, and self-evaluation. Finally, volitional styles such as conscientiousness, independence, and responsibility influence how strategies are used and regulated.
Corno (1993) asserted that volitional strategies are not merely energized by motivations, but more important, these strategies are contingent on different kinds of motivations. For example, when motivations possess personal significance, they are intrinsic and will be associated with higher level strategies. In contrast, a student who wishes to receive recognition for reading may not necessarily be concerned with understanding or enjoying the content of a book or story. This student will attempt to be perceived as competent and to comply with the demands of the teacher conscientiously. Yet the student may not read on his or her own, share books with friends, or pursue difficult tasks that are not assigned.

Some motivations, such as fear of failure, may lead to strategies of low goal setting, avoidance of risk, and minimal effort. These strategies may help a student fulfill the intention of avoiding failure but will not foster deep comprehension or extended reading for personal initiative. We expect that students who possess intrinsic motivations for reading will work independently, show responsibility, and conscientiously translate their intentions into actions. Thus, motivational and volitional systems work in close association, and exploring their joint functioning during reading was one purpose of this study.

Relationships between students' motivations and their use of reading strategies during learning have been examined by several investigators. Pintrich and De Groot (1990) conducted a study of 173 seventh-grade students from science and English classrooms. The students responded to a self-report questionnaire assessing student motivation, cognitive strategy use, and the management of effort. The motivations of intrinsic value and self-efficacy strongly predicted students' uses of strategies.

Intrinsic value was measured with statements such as the following: "It is important for me to learn what is being taught in this class," "I like what I am learning in this class," "I think what I am learning in this class is useful for me to know." Self-efficacy was measured with such statements as "I expect to do very well in this class," "I am certain I can understand the ideas taught in this course," "Compared with other students in this class, I think I know a great deal about the subject."

Both intrinsic value and self-efficacy predicted self-regulation of strategies measured with such items as "I ask myself questions to make sure I know the material I have been studying," "Before I begin studying I think about the things I will need to do to learn," "When I'm reading I stop once in awhile and go over what I have read." Intrinsic value correlated .73 with self-regulation, and self-efficacy correlated .44 with self-regulation. In addition, intrinsic value and self-efficacy predicted student grades and how well they did on seat work, quizzes, essays, and reports.

Meece, Blumenfeld, and Hoyle (1988) also found that intrinsic motivation predicted students' cognitive strategy use in science classrooms. They examined students' orientation to task mastery, which referred to interest in learning rather than interest in showing competence to the teacher or other students. They measured task mastery by having the child respond to such statements as "I want to learn something new" and "I felt involved in my work." They asked students to reply to a questionnaire on their use of cognitive strategies, containing such statements as "I asked myself some questions as I went along to make the work make sense to me." Students' motivations for task mastery correlated .63 with their use of cognitive strategies when several other motivational constructs were statistically controlled.

Finn and Cox (1992) added generality to the relationship of motivation and strategy use by reporting that students who were intrinsically motivated in a learning situation were more likely to have high standardized achievement test scores in reading than students who were less intrinsically motivated.

The reciprocity of motivation and cognition during reading includes the effects of strategy learning on motivation levels. Schunk and Rice (1985) reported that learning a strategy for reading increased students' reading self-efficacy. Students who were taught to verbalize a strategy for comprehension increased their beliefs in their personal capabilities for successful performance of a particular task. The authors concluded that "training students to use self-regulated learning strategies such as self-verbalization improves their perception of efficacy, motivation, and learning" (p. 197).

Zimmerman, Bandura, and Martinez-Pons (1993) confirmed that possessing strategies for learning increased students' aspirations. They reported that students who had high self-efficacy for the strategies of summarizing, outlining, and taking notes were likely to set higher academic goals than students with lower self-efficacy for these strategies. Although motivations clearly influence strategies, the basic purposes of strategies in learning have not been addressed in this article. One purpose that is prevalent in Grades 3 to 12 is conceptual learning from informational text, which is considered next.

**Motivations for conceptual learning from text**

When motivations for reading are viewed as goals and commitments toward learning through literacy activities, the relationship of motivation to conceptual learning becomes apparent. Students who have a commitment to understand the content of an instructional unit are likely to get a deeper understanding of the content than students who possess different kinds of commitments.
Students whose motivations are more extrinsic, such as working just to complete an assignment or gain recognition for good performance, are likely to engage in rote learning and gain verbatim knowledge rather than a fully integrated conceptual understanding (Pintrich, Marx, & Boyle, 1993). Thus, it can be expected that intrinsic motivations will yield higher levels of conceptual learning than more extrinsic motivations.

In addition to motivational orientations of students, topic-based interests also influence conceptual learning from text (see Alexander, Kulikowich, & Jetton, 1994, for detailed discussion). For instance, Hidi and Anderson (1992) investigated the characteristics of particular texts that affected how interesting they were to students and that led to increased conceptual understanding. Fourth and sixth graders read three different types of texts about inventors. The first type of text contained high action, strong character identification, novelty, and real-life themes related to the experiences of students. The second type of text contained additional description and elaboration on the themes, and the third type presented new information intended to peak the interest of students. Students showed the highest interest ratings and conceptual recall for the high-action, life-theme revision of texts. Students also showed extremely high recall on explicit descriptions of scenes such as how to build an igloo.

Although Hidi and Anderson (1992) did not control the variables of background knowledge and intelligence in the relationship of interest and text understanding, Schiefele (1992) did introduce these controls in his study of interest and comprehension in college students. Schiefele reported that students' ratings of interest for text predicted their level of conceptual understanding of the text only if students experienced feelings of enjoyment, involvement, or personal significance of the topic. This leads us to conclude that text-based interest evoked intrinsic motivations of involvement, enjoyment, and personal significance that then generated increased conceptual understanding of text.

**Contextual influences on motivations for reading**

Although students come to school with motivational orientations developed during the preschool years (Deci, 1980), the different contexts of instruction also greatly influence student motivations as they go through school (Ames, 1992). Previous research suggests that contexts that increase intrinsic motivation will be socially interactive, with freedom for the learner (Blumenfeld, 1992; Turner, 1995), providing strategic tools for learning (Guthrie, McGough, Bennett, & Rice, 1996), and real-world literacy tasks (Newby, 1991).

However, few investigators have attempted to implement and then describe extended, instructional contexts (Steveneson & Carr, 1993) designed to enhance intrinsic motivation for literacy. One exception is Covington (1992) who reported that a global gambit project enhanced intrinsic motivation of ninth-grade students in a social science class. In the project, students studied global warming by observing temperatures and comparing them with temperatures of one century ago and measuring the effects of acid rain on local statues. Students proceeded to read voraciously and monitor their learning as they addressed problems of global warming.

In addition, Blumenfeld et al. (1991) have argued that the project-based approach to instruction, in which students collaborate to create an artifact such as a diorama or a chart to display their learning, increased motivation. Although these approaches hold promise, clear evidence of their effects on the growth of intrinsic motivation has not been presented.

**Questions for this study**

Several authors (e.g., Blumenfeld, 1992; Graham & Golan, 1991; Zimmerman & Martinez-Ponz, 1992) have pointed to the need for studies that explore how intrinsic motivations and strategies for learning influence each other across time in actual classroom settings. For instance, Blumenfeld (1992) suggested that we need to examine how qualities of a task, such as variety and challenge, relate to motivational processes across time. Graham and Golan (1991) said that relating distinct motivational states to specific cognitive processes was important. Zimmerman & Martinez-Ponz (1992) noted that "researchers need to undertake microanalysis of the role of self-efficacy at many points before, during, and after various strategic efforts to learn" (p. 201).

Jagacinski (1992) concluded that "research is needed that examines how differences in achieving orientations interact with situational demands" (p. 321). In keeping with these recommendations we have used the following questions as guides for the present study. In this study we attempted to construct educational contexts that would enhance the growth of literacy engagement and to describe this growth. Because the purpose of this investigation was descriptive, we did not compare students who received CORI with a control group.

1. Which aspects of literacy engagement increase during CORI?
2. Were the increases in literacy engagement educationally significant?
3. How highly correlated were intrinsic motivation and engagement within and across time?
4. How do changes in intrinsic motivation, amount and breadth of reading, and volitional strategies relate to each other?
Method

To address these questions, we implemented an instructional program designed to enhance literacy engagement, charting the growth of students from fall to spring as they participated. Our description of growth was both quantitative and qualitative. The qualitative cases were selected for typicality (Erickson, 1986) to exemplify group trends. The quantitative analyses were done to assure that the conclusions about the growth of literacy engagement were warranted for the population of students and individuals within the populations (see a fuller rationale for this approach in Brown, 1992).

Participants and setting

One Grade 3 and one Grade 5 teacher in one elementary school and one Grade 3 and one Grade 5 teacher in another elementary school in a diverse suburban school district in the mid-Atlantic region of the USA volunteered to embark on this venture, accompanied by one reading specialist in each school. Both schools were Chapter 1, K–6 schools with approximately 35 students in each of 15 classes. The schools had low (bottom quartile) reading and math achievement, and students were grouped heterogeneously in classes.

The teachers, who possessed 10–15 years of experience in the profession, were selected because they were interested and able, but not because they were nominated as exemplary. Schools were identified by the district supervisor of reading as representative of the district in size, quality, and neighborhood income.

Students were 140 boys and girls from a lower income ethnically diverse population. Approximately 35 students began the year in each classroom. The students were African American, Hispanic, Asian, and Caucasian. A substantial portion of the students (35–60%) qualified for a free or reduced-fee lunch. Third-grade classrooms were self-contained. Fifth-grade teachers taught English/Language Arts and science to the students in the study. They taught other science classes in a departmentalized system. The researchers served as mentors for the project, but not as teachers. They worked collaboratively in summer preparation activities and collected the data.

Preparation for teaching consisted of a summer workshop of 8 half days held at the schools with the four teachers, two reading specialists, one university faculty member, and one graduate student. This group continued as an inquiry team in six monthly meetings during the school year. The university faculty member coordinated the summer workshop, guiding each teacher toward his or her own classroom design. He also supervised the graduate students in collecting data from the children.

Concept-Oriented Reading Instruction: An overview

The Concept-Oriented Reading Instruction (CORI) program was a year-long instructional design implemented in four classrooms in two elementary schools. A major purpose of the program was to increase students' engagement in literacy and science. The program was designed in collaboration with teachers and reading specialists in two elementary schools. The instructional framework contained four phases: (a) observe and personalize, (b) search and retrieve, (c) comprehend and integrate, and (d) communicate to others. Examples of the activities are given for third grade only, due to limitations of space.

Observe and personalize. Our first step in engaging students in literacy was to provide opportunities to observe concrete objects and events in their natural world. Observing natural objects such as a tree, flower, cricket, caterpillar, bird nest, or feather was intriguing. After experiencing an initial fascination with tangible, concrete objects, students began to wonder and to ask questions that led to conceptual interests. Students brainstormed and explicitly stated the questions they wanted to explore with additional observations, data collecting, reading, writing, and discussion. Observing the real world was a point of departure for extended literacy, and it provided a frame of reference that enabled students to select reading and writing activities and to self-monitor their pursuits.

Grade 3 classrooms studied the adaptation of animals to their environments beginning with a 12-week unit on birds. By observing bird nests, attempting to build their own bird nests, drawing feathers, recording behavior at feeding stations, simulating the crop in a classroom experiment, and visiting a display of stuffed birds, students gained a long-lived curiosity. Students kept journals of their observations, which are presented without alteration of syntax or word choice although spelling and punctuation were corrected for ease of reading. One student reported that

We built our nest with leaves, grass sticks and twigs. Mud too. But first we looked for each of these things at the playground. Clay was to stick our nest together because if we didn't have clay our nest would break. We called the clay mud. I learned that it's hard to make a nest unless you really try to. I learned that birds have a hard time making nests but we read a book that helped us learn and I found out that if you try with a group it might be easy. And you might make a lot of friends.

Students personalized their interest in learning about birds and their environments by writing questions both as teams and individuals. Questions were placed on the classroom walls, forming the cornerstone of a co-
herent sequence of learning activities that connected science with language arts activities. Students were excited and gratified by having their questions legitimated and publicly displayed.

Grade 3 science goals included observing, gathering and recording data, recognizing patterns, comparing, and developing explanations. Science content in Grade 3 emphasized structural characteristics of birds such as beaks and feathers and functional characteristics such as flying and feeding that aid survival.

**Search and retrieve.** Teaching students how to search was fundamental to enabling them to pursue their interests and answer the questions they generated from observational activities. Students were encouraged to choose subtopics for learning and to search for books, resources, references, pictures, and explanations of the topics they chose. Students were taught how to search for books in the school library and to find books in the classroom. They learned to use the table of contents, index, headings, and pictures as guides.

Strategies for searching were taught explicitly through teacher modeling, peer modeling, teacher scaffolding, guided practice, and teamwork. Typically, teachers presented a directed lesson using a class set of one book for all students. Teachers emphasized book organization, relevance of information, appropriateness of detail, and the differences between facts, explanations, and opinions. Teams of students then explored their group sets of information books and exchanged ideas about how to search for ideas in them.

Students were taught four fundamental search processes identified by previous investigators (Armbruster & Armstrong, 1993; Guthrie, Weber, & Kimmerly, 1993) including (a) forming goals, which refers to knowing what you want to find or having an objective for the search activity; (b) categorizing, which refers to understanding how materials are organized; (c) extracting, which refers to finding critical details, note taking, paraphrasing, and summarizing, within a book or resource; and (d) abstracting, which refers to synthesizing or putting ideas together and forming a general understanding.

For 3–4 weeks in the middle of each unit, teachers addressed at least one aspect of the search daily for 15–30 minutes. Teachers modeled each of these stages, and students discussed them in groups and recorded progress toward each of them in their journals.

**Comprehend and integrate.** As students followed the interests they had generated from their observational activities, they identified a wide range of texts and resources that were relevant. The phase of search and retrieve yielded a rich reserve of interesting material, but the students faced the challenge of comprehending and integrating. To help students in fully comprehending and integrating the texts with their own previous knowledge, teachers emphasized (a) determining the topic of a text selection, (b) detecting critical details, (c) summarizing the text, (d) making comparisons between texts, (e) relating illustrations to text, (f) developing criteria for evaluating a book, and (g) critically reflecting on the organization of information and the author's point of view. Students also learned that a novel or short story may address the same topic as an informational book and will provide a different experience of the theme.

Trade books were used exclusively. Basal readers were not used for any purpose, and science textbooks were used rarely for reference. Grade 3 students began the year by reading narratives such as *Owl Moon* by Yolen (1987). At later points in the unit they read the novels *White Bird* by Bulla (1966) and *Wingman* by Pinkwater (1975), and poetry on birds. Within these books, teachers emphasized imagery, aesthetics of language, and characterization as well as the traditional constituents of setting, plot, conflict, and resolution.

Third graders were taught to use informational books to pursue the interests they formulated during the observing and personalizing phase of instruction. Practice searches were conducted, first using teacher-generated questions. Later students formulated their own questions and found appropriate informational texts. To help students comprehend books, teachers provided explicit instruction in identifying topic, details, and writing summaries. Through teacher modeling, peer modeling, and small-group discussion, students were provided instruction in fix-up strategies, enabling students to (a) use pictures, illustrations, diagrams, and graphs; (b) refer to their own questions; (c) look up vocabulary in an index, glossary, or dictionary; (d) break text into parts and put it back together; (e) ask peers and teams; (f) form images about what they know; (g) reread the text in a new way; (h) slow down or speed up; and (i) consult their own background knowledge.

Besides comprehension strategies, students were taught notetaking and critical reflection on information from expository books. Using their own questions, interests, and topical knowledge as criteria for judgment, students learned to critique books.

**Communicate to others.** Through CORI, students became experts on the topic about which they chose to learn. As they gained knowledge, students wanted to express their understandings to others. To foster this self-expression, teachers provided instruction that enabled students to present their understanding in many forms, including a written report, a class-authored book, dioramas, charts, and informational stories. Teachers coached students in identifying an audience, adapting their mes-
sage to the audience, identifying critical details, and elaborating their writing. Students were encouraged to express their understandings in a variety of coherent, persuasive, and accurate communications to classmates or other audiences of their choosing.

Grade 3 teachers invited students to make charts about their observations of birds. One class created wall displays of the materials found in bird nests. Another class created charts of adaptive features such as beaks and feet. The students wrote journals, and small classroom teams composed books on their favorite bird that were illustrated, covered, and shared with other teams.

**Materials**

*Performance assessment of engaged reading.* We conducted an assessment designed to reflect a wide spectrum of motivational and strategic literacy processes that appeared in CORI. The assessment was intended to generate data for addressing questions 1–3.

Our performance assessment was designed to enable students to do seven distinct, but connected tasks: (a) stating prior knowledge (writing what they know about the topic); (b) searching (finding resources and ideas about the topic); (c) drawing (expressing what they have learned through drawing); (d) writing (communicating their learning through composition); (e) conceptual transfer (addressing a related problem using conceptual knowledge learned during the unit); (f) informational text comprehension (understanding an expository text related to the theme); and (g) narrative interpretation (understanding and responding to a literary text on the theme of the unit). See Appendix A for a description of the performance assessment.

Although performance on these tasks reflects the use of cognitive strategies, the assessment was also responsive to motivations. The tasks were open-ended and unhurried, thus rewarding effort, persistence, and elaboration. For example, in the search task, students were given packets. Each packet was a two- to four-page text with illustrations. The third-grade booklet contained 12 packets and the fifth-grade booklet contained 14 packets. A question was presented to the student within the booklet. Students were free to use the table of contents, index, headings, and illustrations to find information about the question. The log of the search described which resources were selected, the reasons for selecting them, and the information they learned from reading.

In addition, tasks were integrated into a theme, permitting students to fulfill their motivations of curiosity and involvement. To reflect these motivations, the coding rubrics recognized elaboration and extended effort. For example, in the search rubric, students who gave detailed reasons for choosing packets scored higher than students who gave vague reasons. Extended effort was recognized by giving higher scores to students who recorded notes from many relevant packets. The interest value of the assessment was apparent as students in most classes asked to take the assessment home to show their parents.

*Appraisal of motivations for literacy.* To determine the nature of the students' motivations for literacy, we identified 24 students, 6 students from each classroom in the fall of 1993. Each teacher selected students to represent two highly engaged, two moderately engaged, and two less engaged readers. The interviewer followed a semistructured, student-responsive questionnaire and tape-recorded the exchange. These appraisals were intended to generate data for addressing questions 3 and 4. The questionnaire began with a set of 13 questions about favorite activities beginning with "What do you like to do for fun?" The second section contained 37 questions about reading for enjoyment. Beginning with "Do you ever do any reading for your own interest?", these questions allowed students to describe the depth and breadth of their motivation for reading. The third section contained 21 questions about reading in school, which also elicited the students' depth and breadth of reading activities and motivation for reading.

Transcripts were coded using an inductive analytic procedure (LeCompte & Preissle, 1993). According to this procedure, we divided the statements from four interviews into categories of motivations and volitions; we then classified statements from a second set of four interviews and attempted to find new or redundant categories. This final set consisted of our rubric for motivations and volitional strategies.

Following Corno’s framework (Corno & Kanfer, 1993), motivations were characterized as goals for participating in literacy events, volitional strategies were defined as the students’ actions or procedures to attain the motivational goals, and styles were characteristic modes of participating in events (see Appendix B). Each motivation, volitional strategy, and style was given a strength rating of 1 (low) to 3 (high). High ratings reflected motivational processes that were highly important, frequent, detailed, and occurring across contexts.

To examine interrater agreement, one author and another independent person rated two randomly selected transcripts on all of the categories in the rubric. Agreement was 82% for exact coding, and 89% for adjacent coding, in which rating within one number was accepted.

**Procedure**

The performance assessments were conducted in Grade 3 and Grade 5 classrooms as teacher-led instruc-
Growth of literacy engagement

...tional units lasting 4 to 6 days. Half the students took one topic (owls for Grade 3; trees for Grade 5), and half took a different topic (ponds for Grade 3; tides for Grade 5) in September 1993; and the topics were reversed in the March 1994 administration. Student responses were coded according to the rubric in Appendix C. This rubric was constructed by an inductive-analytic method (LeCompte & Preissle, 1993).

The first two authors (Guthrie and Van Meter) sorted a sample of 12 student responses into the largest number of categories that we thought would be reproducible. We then sorted a second sample of 12 responses, adjusting our categories and classification of responses, until we attained a consensus. To determine the level of interrater agreement, two other raters examined the responses to each section of the performance assessment of 6 third-grade students and 6 fifth-grade students. Each rater gave a numerical rating to each section of the assessment for each student. Across all students and sections, the two raters had 93% agreement. To chart growth, we compared the performance of all students on the seven measures on the counterbalanced topics, permitting us to see generalized gains in literacy engagement.

The motivation interviews were conducted by one graduate student with the same 20 students in October 1993 and March 1994. Although we began with 24 in October, we lost 4 students who left the school district. A graduate student, not involved in the performance assessments, gave the interviews to increase the perceived independence of the motivational interviews and the performance assessments. Coding procedures are described under the section on the appraisal of motivations for literacy.

The program of CORI was provided for the students from the beginning of September 1993 through the end of May 1994. All reading/language arts and science were taught through this instructional framework for all students in these classrooms.

**Results**

**Question 1: Which aspects of literacy engagement increased during Concept-Oriented Reading Instruction?**

The performance assessment of reading and language arts was administered to all Grade 3 and Grade 5 students in the fall and spring. Because each student took the assessment on different topics in the fall and spring, the differences in student performance during the two periods represent changes in the processes of literacy engagement independent of the particular topics. As indicated in the Method section, the assessment contained tasks that required cognitive strategies in a situation that was sensitive to motivations. Table 1 presents the results of the performance assessment. Preliminary analyses showed very few differences across topics in each grade; therefore, we collapsed across topics and present the results that way.

**Stating prior knowledge.** There were no differences between levels of prior knowledge in the fall and spring at either grade level.

**Searching.** As described in the Method section, this part of the assessment provided a substantial, realistic opportunity for students to search for ideas in a collection of packets. Table 1 shows the gain in performances from fall to spring, summed across both topics for the two age groups. Although Table 1 contains means and the statistical analyses were computed on means, we use medians to discuss the findings because medians can be directly related to the rubric levels.

Grade 5 students began the year with a median of two on this measure. As the rubric shows, a median of two indicated that these students could locate at least two relevant packets and some irrelevant ones. They

<table>
<thead>
<tr>
<th></th>
<th>Fifth grade</th>
<th>Third grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stating prior knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>1.90</td>
<td>2.00</td>
</tr>
<tr>
<td>SD</td>
<td>.78</td>
<td>.68</td>
</tr>
<tr>
<td>Searching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>2.16, 2.76</td>
<td>2.72, 3.80</td>
</tr>
<tr>
<td>SD</td>
<td>1.05, .95</td>
<td>1.05, 1.05</td>
</tr>
<tr>
<td>Drawing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>2.64, 3.12</td>
<td>2.35, 2.41</td>
</tr>
<tr>
<td>SD</td>
<td>1.16, 1.12</td>
<td>.99, 1.22</td>
</tr>
<tr>
<td>Writing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>2.50, 2.88</td>
<td>2.48, 3.26</td>
</tr>
<tr>
<td>SD</td>
<td>.95, 1.06</td>
<td>.84, .98</td>
</tr>
<tr>
<td>Conceptual transfer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>2.48, 2.82</td>
<td>2.61, 3.06</td>
</tr>
<tr>
<td>SD</td>
<td>.84, 1.20</td>
<td>.98, .95</td>
</tr>
<tr>
<td>Informational text comprehension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>1.60, 2.35</td>
<td>1.67, 2.27</td>
</tr>
<tr>
<td>SD</td>
<td>.76, .65</td>
<td>.78, .71</td>
</tr>
<tr>
<td>Narrative interpretation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>3.69, 4.29</td>
<td>2.85, 4.04</td>
</tr>
<tr>
<td>SD</td>
<td>1.14, 1.01</td>
<td>1.01, 1.07</td>
</tr>
</tbody>
</table>

Note. Cells sharing the same subscripted letter differ significantly. Possible score is 5.
Table 2  Third-grade search log

<table>
<thead>
<tr>
<th>Packet</th>
<th>Why did you choose this packet?</th>
<th>What did you learn from this packet?</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>To see how they hunt silent.</td>
<td>I learned that an owl can turn his head all the way round. It can eat a skunk.</td>
</tr>
<tr>
<td>I</td>
<td>I want to know how they kill.</td>
<td>I learn that only small claws can kill snakes.</td>
</tr>
<tr>
<td>G</td>
<td>I want to know what kind of bird eats fish.</td>
<td>I learn that a flamingo eats fish.</td>
</tr>
<tr>
<td>K</td>
<td>I want to know how they talk to each other.</td>
<td>I learned that....</td>
</tr>
<tr>
<td>B</td>
<td>I want to know if a male hawk is big.</td>
<td>I learned that a female hawk is bigger.</td>
</tr>
</tbody>
</table>

Table 2: Third-grade search log

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<td>B</td>
<td>I want to know if a male hawk is big.</td>
<td>I learned that a female hawk is bigger.</td>
</tr>
</tbody>
</table>

gave at least one clearly stated reason for the selection of a relevant packet, and they wrote simple, clear notes illustrating what they had learned from one selection.

In the spring, the typical student progressed to a level of three on the rubric. This showed s/he could identify three relevant packets and may have found several irrelevant ones. Appropriate reasons for selecting at least two of the resources were given. The increase reflects not only many relevant packets selected but also improvements in the notes taken. Most prominently, students' notes showed an accumulation of information gained during the search process, illustrating metacognitive awareness in a conceptually driven search activity.

Change over time from fall to spring was analyzed quantitatively with a paired sample t-test. The spring scores were significantly higher than the fall scores, \( t(47) = 3.84, p < .001 \). There were 72 Grade 5 students who began CORI in the fall, but only 48 students remained in the spring due to the transient population in the school. For Grade 5, these 48 students were used in the analysis of stating prior knowledge, searching, drawing, writing, and conceptual transfer. Note that the number of students for whom data on informational text comprehension and narrative interpretation were available was reduced to 43 and 45, respectively.

Grade 3 students made comparable progress during the year of instruction. The typical learner gained one level, moving from a score of 3 to 4, which was statistically significant according to a paired sample t-test, \( t(45) = 4.56, p < .001 \). Although 68 Grade 3 students began the year, only 46 students remained in the spring due to the transient population. These 46 were used in the Grade 3 analysis of stating prior knowledge, searching, drawing, writing, and conceptual transfer. For Grade 3, data were available for 48 students on informational text comprehension and narrative interpretation.

In the fall, Grade 3 students performed at a level of three, indicating that they could locate two relevant packets of information and very few irrelevant ones, giving an appropriate reason for at least one of their selections and sensible notes on one packet. Progressing one level forward in the rubric meant that these students were capable in the spring of locating at least three relevant packets, with few irrelevant packets, and giving appropriate reasons for at least two of their selections. Clear and detailed notes for at least two selections were provided, and irrelevant notes did not contradict the other information in the search log. Again, these increased scores show that more packets were read and the quality of notes improved. Note that the scores of Grade 3 and Grade 5 cannot be compared because the rubric levels were referenced within grade and not across grades. A sample of a spring search log for owls is shown in Table 2.

**Drawing.** This was a measure of ability to represent conceptual understanding through drawing. Grade 5 students began the fall at a median of two, indicating that they generally included appropriate objects or parts of a system in their drawings. However, the functions of these elements and their relations to each other were absent or vaguely described at best. Students typically progressed to a median of three, showing an understanding not only of the objects, parts, and elements but also the relationships among them.

The relationships, however, were vague and undefined. Students at a median of three in the tide task showed the scientifically correct objects such as moon, earth, sun, and water, with no scientifically incorrect objects such as beach chairs and blankets. A vague depiction of relationships was included. Level three drawings also showed several connections represented in a vague and undefined form. Students increased significantly during the year according to a paired sample t-test, \( t(47) = 2.13, p < .038 \). Grade 3 students did not increase significantly during the year.

**Writing.** The writing task provided students an opportunity to display their conceptual understanding. The drawing they had completed was available for their inspection during the writing activity. In the fall, Grade 5 students performed at a level of two, which indicated they could describe a few parts or objects, but any comparisons or functions were vaguely described or absent. The typical fifth-grade student progressed to a level of three indicating s/he could show an understanding of relationships among relevant objects. Although the relations were not presented in a high amount of detail, they were scientifically correct. The student gain from the fall
Growth of literacy engagement

A typical Grade 5 student in the spring who performed at level three on the trees assessment stated that leaves can help the plant turn light into food and roots help the plant suck up water. The trunk holds the tree together and leaves change color in the fall; trees don't only depend on roots but their leaves too, they help give off gas oxygen and help the tree get food. A plant has to have roots to help the tree stay in the ground.

Typical Grade 3 students began the fall at the level of two on the writing task. They listed some parts of the topic and possibly a vague function for one of the parts, but fewer relationships or other functions were included. Students moved to a level of three in the spring. Not only did they include several parts of their object, but also functional connections were made between at least two of the parts. Elements of the object were connected to the total system in a vague fashion. Gains from fall to spring for Grade 3 students were statistically significant, \( t(47) = 4.09, p < .001 \).

This example shows Grade 3 writing in the spring.

A student who wrote about birds stated:

- The beak lets it eat and his feet help him catch food. His legs so he can walk his claws to catch food and his mouth to eat food and his big yellow eyes to see with.
- The wings help it fly and the horns help it to know if it is another barn owl. Its claws help it catch food and its eyes help it to see. The heart helps the owl to live and the food helps the owl live too. The claws help the owl catch his prey.

Conceptual transfer. The conceptual transfer activity required an extension and application of concepts learned during the search activity. The problem consisted of a novel situation in which students were expected to use the conceptual knowledge and science principles previously learned. Grade 5 students did not increase significantly on this measure. However, Grade 3 students progressed significantly in conceptual transfer from the fall to the spring, \( t(45) = 2.36, p < .023 \).

In the fall the typical third grader had a median of two that indicated s/he gave an incorrect, illogical, or nonscientific solution. S/he progressed to a level of three. S/he could present the problem and some requirements for the task, but s/he could not construct a complete solution.

An example of Grade 3 conceptual transfer in the spring is shown for a student who took the owl version of the assessment. This version asked what an owl would be like if it were blind but were surviving successfully in the wild. A student who answered at a level of three stated that these owls will have good hearing be very good at catching. Their beaks will help them eat. Their wings help them fly. Their nose will help them dig. They will have to feel what they pick up and will have to be good at catching mice.

Informational text comprehension. For both grades and all assessment topics, students were given an illustrated, informational text that was relevant to the topic. A question was presented that required the student to synthesize information from the text and illustration, and to write an answer. Grade 5 students began the fall at the level of one, which showed they relied heavily on prior knowledge or on information from only one portion of the text. Separate sections were not integrated, and some incorrect information may have been included.

Fifth graders moved to a level of two in which their answers integrated information from two or more parts of the text and referenced the text appropriately. However, significant portions of text were omitted, and the statements were not elaborated. Gain for fifth graders was statistically significant, \( t(42) = 4.99, p < .001 \).

Third graders began the fall at the level of one, indicating they provided answers that came from only one part of the text, and may have included incorrect or irrelevant information. They moved to a level of two, indicating they could integrate information from two or more parts of the text, but the integrations were not elaborate or detailed. Third graders’ change from fall to spring was statistically significant \( t(47) = 4.16, p < .001 \).

Narrative interpretation. In this portion of the performance assessment, students were given one integrated episode of approximately 1,000 words from a narrative book. Students were first asked to read the text and then answer three different questions. The first question requested a low level of reproduction of one portion of the narrative. The second question requested students to make inferences and generalizations about the character in the story. The third question asked students to reflect on their own experience in relation to one character. Answers to all of the questions were coded about whether they were consistent with the text and whether they were elaborated.

Grade 5 students began the year with a median of three. They had two answers to two of the questions that were consistent with the text, but the answers were not elaborated. Fifth graders progressed to a level of four suggesting that they had three answers consistent with the texts but little elaboration. This increase from fall to spring was statistically significant, \( t(44) = 3.42, p < .001 \).

Grade 3 students in the fall performed at a level of three indicating they gave text-consistent answers to two of the questions. Third graders progressed to the level of
four in the spring showing three text-consistent answers but little elaboration. Third grade progress was statistically significant, \( t(47) = 6.25, p < .001 \).

**Question 2: Were the increases in literacy engagement educationally significant?**

The previous results may not reveal whether the gains in literacy engagement were educationally and practically significant. We did not compare the gains in literacy engagement to standardized reading test scores or grades, because standardized scores may not reflect higher order learning, and grades are too normative within one classroom. However, to describe the magnitude of the impact of the CORI on students' literacy engagement, we compared third graders' performance in the spring, after receiving a year of CORI, to the fifth graders' performance in the fall before the year began, and before CORI had been presented. Of course, the fifth graders in the fall were more than 1 year older, with 1 year more of schooling than the third graders in the spring.

To make the comparison, we selected two typical cases (Erickson, 1986). Typicality was defined in the following manner. Averages of all students were obtained for the searching, drawing, writing, and conceptual transfer tasks for both the Grade 3 spring performance on the owl assessment and the Grade 5 fall performance on the tree assessment. All scores were then inspected for each of these stages to identify typical performances at each stage (i.e., those performances that were equal to the average group score).

Two third graders and three fifth graders fit these descriptions of typical performance across each of the four stages inspected. Scores for stages six (informational text comprehension) and seven (narrative interpretation) were then used as tie breakers. The two selected cases were thus typical of their grade levels. Comparisons were then made regarding the quality of the performances at each stage. Quality was defined in a manner consistent with the scoring rubrics.

**Writing.** When Grade 5 students were asked to write what they had learned about the parts of the tree and how the parts help it to live, one fifth grader wrote:

```
What I know about trees. They have different parts like the Roots The trunk and the branch. Some trees live millions of years ago and that they lived in different time. Some trees you have to water under roots or they will die.
```

In this answer, the only portion of the tree connected to a survival function was the roots, which were part of this student's background knowledge. The only other reference to tree parts involved a listing of the trunk and branch. Again, information irrelevant to the question was included in the statement that some trees lived millions of years ago. This answer included only one adaptive system with a number of plant structures.

The third grader responded to the question of “Tell how the parts of an owl help it to live” by stating that
The owl uses its feet to get a mouse or a rat and eat it a live. Some owls hunt at night. Owls take birds nest and live in it. Although this Grade 3 student included some background (e.g., hunting), she added that the kind of prey can be a mouse or a rat. She also added a new adaptation, nesting. The third grader included two systems of adaptation, hunting and nesting, while the fifth-grade answer included only one relevant system, the need for water at the roots of a tree.

**Conceptual transfer.** The Grade 5 student was asked to solve the problem of how a tree could live in 1,000 feet of snow 10 months a year. This student wrote:

I don’t think the trees will live, because if we had that much snow the tree will keep falling off branch by branch because too much pressure is going on to it. Because when the snow balls drop it is just too much pressure.

No solution was forwarded, and adaptations for survival were not presented. The Grade 3 student was asked how a species of blind owls could survive. She wrote:

The owl would have to be a good smeller, hunter, Mother or Father, fast thinker and able to use his feet, head, wings. The owl would need to be a good hunter. He would need to teach his or her child to use its wings, feet and head.

This was a viable solution to the survival problem. Two new adaptations were introduced, smelling and teaching. Not only would an owl have to be a good hunter, using its sense of smell and its feet and wings, it would also have to be a good parent to teach the child how to survive without sight. The principle that structures and their functions are modified by the conditions of the environment was evident.

In sum, comparison of one statistically typical Grade 3 student in the spring with one statistically typical Grade 5 student in the fall suggests that the third grader at the end of the year was equivalent to, or higher than, the fifth grader at the beginning of the year. The third grader showed a more integrated knowledge representation using a greater variety of adaptive systems and used this knowledge to solve problems more effectively than the fifth grader. While both students brought equivalent prior knowledge to this text-based learning situation, the Grade 3 student built on this knowledge and extended it to solve a novel problem; the Grade 5 student did not.

It should be noted that the fifth grader read a set of materials with more pages and more complexity than the materials read by the third grader. This could be a disadvantage to the fifth grader because this student had harder texts. On the other hand, both students had materials suitable to their grade levels. The fifth grader had a larger number of texts that contained more information, affording more opportunity to select and write about relevant information. Therefore, it is unlikely that the third grader had an advantage.

The coding rubrics in this study were constructed to be appropriate for the two grade levels separately; therefore, a simple rubric level comparison was not possible. However, similarities between these assessments were that each assessment involved texts that were at the students’ grade level. In addition, questions were equated by focusing on the same characteristics of the studied topic (i.e., “Tell how the different parts of an owl help it to live,” “What are the parts of a tree? How do these parts help the tree to live?”). These similarities increased the comparability of Grade 3 and Grade 5 responses.

**Question 3: How highly correlated were intrinsic motivation and engagement within and across time?**

The performance assessment was designed to be sensitive to intrinsic motivations as well as strategies for literacy. Our view of engagement is that motivations are integral to the learning and use of strategies. If this is true, motivations should be correlated with the levels of engagement observed in the performance assessment. To examine this question, we compared the results of the motivation interview with the engagement assessment.

From the motivation interview, we constructed a composite measure of intrinsic motivation. The composite was formed by summing the scores of involvement, curiosity, social interchange, emotional tuning, and self-efficacy for each of 20 students, reduced from 24 due to attrition during the school year. We also constructed a composite measure of engagement by summing the scores on searching, drawing, writing, and conceptual transfer for 19 of these students who completed the spring performance assessment.

We rank-ordered all students on the motivation composite and the engagement composite. For Grade 5, the correlation of the rank orders was .81, which was statistically significant at $p<.01$. For Grade 3, the rank order correlation was .70, which was statistically significant at $p<.05$. These correlations show that students who were intrinsically motivated by involvement, curiosity, social interchange, emotional tuning, and self-efficacy were highly engaged in literacy as evidenced by their high performance in text-based searching, drawing, writing, and conceptual transfer in the assessment. Students with lower intrinsic motivations were lower in literacy engagement. This confirmed our expectation that (a) intrinsic motivations and strategy learning were highly
were equally likely to increase and decrease in literacy engagement as well. In other words, 100% of the students increased in intrinsic motivation and decreased in literacy engagement, while 100% of the students increased in literacy engagement and motivation increased or if one intrinsic motivation decreased and the other was unchanged. Students were placed in the quadrant of decrease/decrease if both decreased. Students were placed in the decrease/increase quadrant if the motivation decreased and the engagement increased.

A pronounced relationship can be observed between change in intrinsic motivation and change in literacy engagement. Thirteen students of the 19 increased in both motivation and engagement. At the same time none of the students decreased in intrinsic motivation and decreased in literacy engagement. In other words, 100% of the students who increased in intrinsic motivation from fall to spring increased in literacy engagement as well.

Students who decreased in intrinsic motivation were equally likely to increase and decrease in literacy engagement. Fifty percent of those who decreased in motivation decreased in literacy engagement. These frequencies showed a statistically significant association according to the chi-square statistic \( \chi^2(1, N = 19) = 4.57, p < .05 \). This association supports the theoretical expectation that increasing the strength and breadth of intrinsic motivations will be associated with the enhancement of strategy-based literacy engagement.

To exemplify these changes in motivation and literacy engagement, we report some interview results with one Grade 5 student. Joy, a 10-year-old Asian American student, exhibited the pattern of noticeable gains in intrinsic motivation during the year. According to her school's reading specialist, Joy had completed the fourth-grade basal text and had consumed the first quarter of the Grade 5 reader before entering Grade 5. Although Joy showed an understanding of the material covered in class through her finished products, she was not quick to volunteer her thoughts when the teacher called for participation from the students.

Recalling the characters in the Sweet Valley series of books created by Pascal (1992), Joy reflected her involvement as follows:

Well um, the girls are about sixth graders, so they're about my age so, they well, it's about their every day life, how they get in trouble and stuff. Well, I, sometimes it's like a mystery, who takes something, so I always um, want to finish it so I could find out who took it or something. Like um, there was this really um, Jessica's friend um, Lila, she's really rich and um, once um, lots of um, their stuff was missing so they—it turned out in Jessica's locker—so they think she took it but she was framed.

From fall to spring, Joy exhibited growth in the strength of her self-efficacy for reading (from medium to high) by volunteering that reading was an activity in which she was competent to participate. She was confident in pursuing her classroom-based interests by retrieving related books in the classroom library. For example, she explained that

We have three book shelves and one that's really big it has um, the topics that we um, pasted up there so we know where to look for the books about the moon. There was these—table of contents and I looked for a specific topic and then, then I skinned through the book and I got, I just read the whole thing....

Joy's involvement, curiosity, and self-efficacy were complemented in the fall by the more extrinsic motivation of recognition. In the spring, however, Joy did not mention any reading for recognition. Instead, she reported a new, social motivation for reading.

Her 11-year-old female cousin became a companion and a discussant for their shared interest in series books like the new, highly sought-after Sweet Valley series books created by Pascal (1992). This new interaction

Table 3 Changes in literacy engagement and intrinsic motivation during 1 year of Concept-Oriented Reading Instruction

<table>
<thead>
<tr>
<th>Literacy engagement</th>
<th>Increase</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Intrinsic motivation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decrease</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: This table contains an N of 19 because the spring literacy engagement score was not available for 1 student.
was formed not only out of family ties, but of a desire to share opinions of a text.

When my cousin gave it to me, she said it was really good, 'cause she read one and she bought it in the book-store.... If I read a new book for her I always tell her what happens so, she always has to read it first. And she takes a long time to read a book. So I have to wait for a long time, I have to beg her to read her books.

Question 4: How do changes in intrinsic motivation, amount and breadth of reading, and volitional strategies relate to each other?

Intrinsic motivation with amount and breadth of reading. Enabling students to read widely and frequently is an aim of CORI. Our theoretical expectation is that intrinsic motivation should be related to frequency and breadth of reading. Furthermore, changes in intrinsic motivation should be related to changes in frequency and breadth of reading. To examine this expectation, we used portions of the interview in which students were asked how frequently they read fiction, sports, nature/animals, romance, biography, directions, science, stories, and history. A score of 0–3 was given to each student on each topic. The sum reflected both the breadth and frequency of reading interests and preferences. For Grades 3 and 5 combined, we classified each student as increasing, not changing, or decreasing in frequency and breadth of reading. These classifications were related to students’ changes in intrinsic motivations as reported in the previous paragraph.

The association of changes in intrinsic motivation with the changes in frequency and breadth of reading was substantial. As Table 4 indicates, 11 students increased in both intrinsic motivation and frequency and breadth of reading. Eighty-five percent of the students who increased in intrinsic motivation also increased in frequency and breadth of reading. Of the 7 students who decreased in intrinsic motivation, 5 of them (70%) decreased in frequency and breadth of reading. This association was statistically significant according to a chi-square test \( X^2(1, N = 20) = 4.06, p<.05. \)

One 11-year-old African American student in Grade 5, Mariah, increased in her intrinsic reasons for reading and increased in the variety of books that she chose to read. Mariah was described by her CORI teacher as painfully shy and not a visibly enthusiastic reader. The reading specialist indicated she was reading on grade level at the time of the interviews.

Mariah read for involvement in the spring, reporting the elements of mystery novels that captured her attention.

In interesting mysteries, they like, they leave follow-up clues to the mysteries so it takes more to figure it out. And in boring ones, it’s just easier to figure out what it is, and you don’t need any clue.

Mariah read a more diverse selection of books in the spring than in the fall. She maintained a strong preference for fiction, including a series of mysteries by a particular author. A new interest in biographies of favorite stars emerged in reading that she did outside school. Mariah showed increased curiosity about nature, referring to the most recent book about animals that she had read.

It was about this lady, who was, um, in college and she wanted to see if she could get instead a chimpanzee to communicate with her. They communicated with sign language. She’d teach them that sometimes. They lived in a trailer together. And then, when she got a new—she got another gorilla, so that the other one wouldn’t be lonely....

Frequency and breadth of reading with volitional strategies. Breadth and frequency of reading were expected to be related to volitional strategies and intrinsic motivations. Volitional strategies are deliberate procedures used to fulfill motivational goals, such as managing resources of time and materials (Corno & Kanfer, 1993). Managing time was evidenced by students who had a time of the day they reserved for reading. From the interviews, we combined the volitional strategies related to time with the volitional strategies related to finding, keeping, and organizing books. We classified students as increasing, unchanging, or decreasing in volitional strategies, and related the strength of their strategies to their frequency and breadth of reading.

There was a substantial association of the students’ changes in frequency and breadth of reading with the changes in their volitional strategies that was statistically significant, \( X^2(1, N = 20) = 11.43, p<.01. \) As indicated in Table 5, 14 students increased in both volitional strategies and reading frequency and breadth. One-hundred percent of those who increased in frequency and breadth of reading also increased in volitional strategies.
At the same time, 5 students decreased in frequency and breadth of reading and volitional strategies. These few students chose to read less widely and frequently, and they used fewer volitional strategies. In sum, volitional strategies for reading were correlated with amount of reading activity.

These trends for the whole group were illustrated by Mariah. Her increased breadth of reading was accompanied by her expanded volitional strategies. Volitional strategies of interest to the investigators included making time to read and finding interesting, appropriate books. In the fall, Mariah cited the public library as her main source for texts to read. In the spring, she reported frequent visits to the public library where she could use the computer to search for book titles. She also talked of receiving books as gifts. In the spring, Mariah found a new source for fiction books to read for her own enjoyment.

Well, we have TAP day—it’s trade-a-paperback day. And we all bring in paperback books, and I got one new. And I’ve had that one in my desk, so when I leave it in the desk, I know I have at least two books in my desk.

Mariah commented on the ways that she coordinates reading around other activities in her daily life. At home, she stated that she tried to read a little bit before she would go outside to play with friends, and then continue her reading afterwards. At school, Mariah explained what she did with her free time.

Sometimes our teacher gives us time in the morning. You can either read a book, or you can make up work that you have to do. I usually read.

### Discussion

**What were the main findings of this study?**

This investigation was intended to initiate our study of how classroom contexts can be designed to enhance the development of literacy engagement. There were several limitations to our purposes. We did not attempt to compare the patterns of change in CORI classrooms to change in control or comparison classrooms. We did not seek to identify which dimensions of the complex classroom environment were more or less influential in promoting engagement. This was not a componential analysis. We did not attempt to compare whether the patterns of change in literacy engagement varied for different demographic groups, such as age and gender. Finally, we did not attempt to describe all aspects of literacy engagement that we believe are important. For example, we have not measured word-level fluency or social dispositions for sharing literacy. Despite the breadth of our descriptive account, there are many aspects of engagement that call for extended research.

**Growth of literacy engagement.** Our basic conclusion from this investigation is that literacy engagement of third and fifth graders increased during their year-long experience in CORI. Not only did teachers observe these increases in literacy engagement through students’ portfolios and classroom participation, but our performance assessment also documented statistically significant increases.

Students' enhanced literacy engagement was evident in their work on tasks that reflected the merger of cognitive strategies and intrinsic motivations. We documented the growth of literacy engagement related to (a) searching for information in multiple texts, (b) representing ideas through drawing and writing, and (c) transferring conceptual knowledge to new situations.

Success in these authentic literacy activities permits us to infer the successful use of strategies. Although many investigators use self-report as a measure of strategies (Collins-Block, 1992; Pintrich & De Groot, 1990), we believe that successful performance on authentic literacy activities in the classroom is a more secure ground for inferring the learning and use of literacy strategies.

Our notion of literacy engagement combines the construct of self-regulation with intrinsic motivation. For both the third and fifth graders in this study, intrinsic motivation was highly correlated with literacy engagement during the performance assessments. This finding is consistent with the results observed by Pintrich and De Groot (1990) that self-reported intrinsic interest and strategy use were highly associated. Our data showed that successful learners were distinguished from the less successful learners in their ability to combine complex higher order strategies with intrinsic motivations of involvement, curiosity, and self-efficacy.

These results confirm that literacy engagement increased during the year for these groups of students. Although the amount of increase was not compared to the changes in a control group because this was not a comparative, experimental study, the magnitude of the

### Table 5

<table>
<thead>
<tr>
<th>Frequency and breadth of reading</th>
<th>Increase</th>
<th>Decrease</th>
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<tbody>
<tr>
<td>Increase</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Volitional strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decrease</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

...
increase was noteworthy. Across time during elementary school, intrinsic motivation usually declines (Harter, 1981; Wigfield & Guthrie, 1995), leading us to suppose that literacy engagement might decline during the year. However, in this study, literacy engagement, which combines cognitive strategies with intrinsic motivation, increased during a year of schooling. In fact, in the case studies, one typical Grade 3 student in the spring, after participating in CORI for 6 months, surpassed the level of literacy engagement observed in one typical Grade 5 student in the fall before receiving any CORI. After documenting these increases in literacy engagement for the groups, we next described the nature of the growth.

Intrinsic motivation and literacy engagement increased concurrently. The second finding was that increases in literacy engagement during the year were tied to increases in intrinsic motivation. Despite the previously cited trend for intrinsic motivations to decrease during the elementary school years, we observed that 68% of the students in our CORI classrooms increased in their overall levels of intrinsic motivation for literacy. Among the students who increased in intrinsic motivation, 100% increased markedly in literacy engagement.

Among students who did not increase in intrinsic motivation (e.g., who stayed the same or who decreased) 50% increased in literacy engagement, and 50% decreased. These findings suggest that instruction that increases intrinsic motivations for literacy may improve the higher order cognitive competence of an extremely large proportion of learners. Of course, strategies may also increase for some learners who do not become more intrinsically motivated due to the power of extrinsic incentives such as recognition and rewards or general cognitive maturation.

Our data do not permit us to determine which comes first, motivation or engagement. We expect they are reciprocal and mutually supportive during long-term literacy learning. These findings are consistent with conclusions from correlational studies reviewed by Ames (1992) and Blumenfeld (1992) that point to high associations between student interest in subject matter and development of cognitive competencies. Our findings contribute to the knowledge base by documenting that long-term increases in motivational and cognitive aspects of literacy are interdependent.

Intrinsic motivations enhanced breadth of reading activity. The third finding of this investigation was that increases in intrinsic motivation were tied to frequency and breadth of reading. Students who became more involved, curious, and social in their literacy activities read a broader range of topics and reported higher frequencies of reading activities than less motivated students. This linkage was particularly important because being an active reader is vital for many aspects of development.

Amount and breadth of reading are related to reading achievement, general knowledge, and societal participation (Guthrie & Greaney, 1991; Stanovich & Cunningham, 1993). Therefore, it is valuable to know that students expanded their reading activities as their intrinsic motivation increased. Also contributing to amount and breadth of reading were volitional strategies (Corno & Kanfer, 1993) such as finding time to read every day, keeping a private place for personal books, and knowing how to get to the library. In sum, amount and breadth of reading increased when it was energized by intrinsic motivations and enabled by volitional strategies.

Classroom contexts that enhance literacy engagement

Literacy engagement in Grades 3 and 5 was associated with distinctive qualities of the classroom context. Although space does not permit an elaborate description, we identified several aspects of the CORI classroom context based on classroom observation, discussion with teachers, and analysis of videotapes.

Consistent with the motivational literature, our observations of CORI suggested that engaging classroom contexts were (a) observational, encouraging students to initiate learning by generating their own questions from real-world observation (Lepper, 1988; Newby, 1991); (b) conceptual, with a focus on substantive topics rather than reading skills (Maehr & Fyans, 1989); (c) self-directing, supporting student autonomy and choice of topics, books, and peers (Skinner & Belmont, 1993); (d) metacognitive, with explicit teaching of reading strategies, problem solving, and composing (Collins-Block, 1992); (e) collaborative, emphasizing social construction of meaning and communities of learners (Almasi & Gambrell, 1994); (f) expressive, creating opportunities for self-expression through writing, debating, and group interaction (Oldfather & Dahl, 1994) and; (g) coherent, containing connections between classroom activities and tasks across the day, week, and month (Gamoran & Nystrand, 1992). Our theoretical perspective is that these classroom qualities accelerate the development of literacy engagement.

Several of these dimensions of classroom context have been examined in other investigations. For example, our conceptual focus is shared by Brown (1992) in her studies of how communities of learners pursue topics in environmental science. Our reliance on writing and problem solving is consistent with Calfee's (1994) program for critical literacy in which children read and write extensively.

Our emphasis on metacognitive strategies of searching for information, representing ideas graphically,
planning, evaluating, and integrating is similar to the thinking guidelines of Collins-Block (1992). Although each instructional theme is important, we expect that it is the integration of all seven dimensions within one instructional unit that enhanced the development of literacy engagement of the students in this study.

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Growth of literacy engagement


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The findings and opinions expressed in this report do not reflect the position or policies of the National Reading Research Center, the Office of Educational Research and Improvement, or the U.S. Department of Education.
### APPENDIX A

**Performance assessment of literacy engagement**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Purpose</th>
<th>Question</th>
<th>Material</th>
<th>Response format</th>
<th>Condition</th>
</tr>
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<tbody>
<tr>
<td>Stating prior knowledge</td>
<td>Determines the amount of conceptual knowledge about the topic before the start of the assessment.</td>
<td>Open-ended question with one or two parts. Example for third grade: “What are the body parts of an owl, and how do these body parts help it to live?”</td>
<td>One sheet of paper is provided to answer the question.</td>
<td>Students write their response in essay form.</td>
<td>Students are given approximately 10 minutes to complete, but all students are expected to finish.</td>
</tr>
<tr>
<td>Searching</td>
<td>This task measures the strategies involved in searching for information from multiple texts. Cognitive strategies include maintaining focus on the question; understanding the organization of information texts using the table of contents, index, headings; sequencing to generate new information; extracting appropriate ideas from selected texts; and taking coherent notes. Motivational attributes measured in this task include effort and persistence in selecting multiple sources, elaboration of reasons for choosing selections, and topic interest as reflected in extended notes about the topic of the search.</td>
<td>Use these packets of information to help you answer the question “What are the body parts of an owl, and how do these body parts help it to live?” Keep a log of your work showing your packet letter, reasons for choosing the packet, and your notes on your reading.</td>
<td>Students are given a set of 12-14 packets of two to four pages each of informational texts. Half are directly relevant to the question, and half are about animals or birds other than owls. Table of contents, index, page numbers, headings, and illustrations are provided. Difficulty of the text ranges from one grade below to two grades below.</td>
<td>Students are given a response log, with columns for packet letter, reasons for choosing a packet, and notes on what they learned.</td>
<td>Students are encouraged to find all of the relevant information, and are all given sufficient time to fill in at least one packet selection, with a reason and notes (30–60 minutes). Students are encouraged to keep working until they have found all of the useful ideas. Students who finish early are asked to wait quietly for 5 minutes and are then permitted to read.</td>
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## APPENDIX A
**Performance assessment of literacy engagement (cont'd.)**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Purpose</th>
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<th>Material</th>
<th>Response format</th>
<th>Condition</th>
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<tbody>
<tr>
<td>Drawing</td>
<td>This task measures the ability to represent conceptual knowledge about birds and their survival through drawing—visual illustration. Drawing may include ideas gained in the search combined with prior knowledge. Motivational attributes of task involvement and interest are reflected by attention to detail, breadth of information, and labeling.</td>
<td>Students are asked to make a picture that shows what they know about the topic (e.g., what are the body parts of an owl, and how do these body parts help it to live?)</td>
<td>One half page of blank paper is provided with the written directions.</td>
<td>Students draw with pencil and label the picture.</td>
<td>Time is provided for all students to finish, about 15 minutes. Coloring is not permitted. The search materials and logs are not available.</td>
</tr>
<tr>
<td>Writing</td>
<td>Students represent their conceptual knowledge about the topic of the task (e.g., the body parts of owls and how they help survival) through writing. Ideas from the search activity and prior experience may be included. Motivational attributes include the effort and persistence in writing elaborate, coherent paragraphs, the expression of fascination about some aspect of the topic, and self-efficacy in the acquisition of conceptual understanding.</td>
<td>Students are asked to write what they know about the topic (e.g., the body parts of an owl and how these body parts help the owl to survive). Students are encouraged to write everything they know.</td>
<td>Students are given one half page of lined paper, which is the bottom half of the paper on which they drew their understanding in the previous task.</td>
<td>Students write or print in the space provided.</td>
<td>Ample time is provided for all students to complete the task, about 20 minutes. The packets and their search logs are not available.</td>
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### APPENDIX A

**Performance assessment of literacy engagement (cont’d.)**

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<tbody>
<tr>
<td>Conceptual transfer</td>
<td>This task measures whether the concepts and principles that were learned during searching were learned in a form that permits problem solving. Motivational attributes include the enjoyment of challenge and the satisfaction of encountering novelty.</td>
<td>A question is asked that invites multiple approaches and answers, using the conceptual knowledge that was represented during the drawing and writing tasks. For example, the third-grade owl question was “Suppose you saw a type of owl that was living a good life. What would its body parts be like, and how would these parts help it to survive?”</td>
<td>Students are given a lined piece of paper with the question at the top. Previous materials are not available.</td>
<td>Students write and/or draw their answer to the question.</td>
<td>Time is provided for all students to finish, about 20 minutes. They are encouraged to compose any answer they think might be appropriate.</td>
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<tr>
<td>Informational text comprehension</td>
<td>This task measures the extent to which students can comprehend the main ideas in an illustrated text of about 200 words. The optimal answer will integrate information from both the illustration and several parts of the text.</td>
<td>The question is a two-part item of the same complexity as the question in the prior knowledge task.</td>
<td>The student is presented the text and illustration with the question following on the next page.</td>
<td>One page of lined paper is provided.</td>
<td>Sufficient time is given for all students to finish, about 15 minutes. Previous materials are not available. The text is on the same general topic (e.g., birds), but specific information from previous tasks will not be useful.</td>
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**APPENDIX A**  
Performance assessment of literacy engagement (cont’d.)

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<tbody>
<tr>
<td>Narrative interpretation</td>
<td>This task measures basic text comprehension and literary interpretive processes in response to narrative.</td>
<td>Three questions are presented to be answered in order. The first question requests a simple recall, (i.e., reproduction of a portion of the text). The second question requests the student to describe the specific motive of one specified character, using text-based information and inference. The third question requests the students to write a personal response about whether a character's action was right or wrong and to describe his/her own belief about the situation.</td>
<td>A brief narrative (i.e., a folktale, or episode from a story is provided, with an illustration).</td>
<td>Students write answers to the three questions on lined paper provided.</td>
<td>Time is provided for all students to answer at least some of the questions, about 20 minutes.</td>
</tr>
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APPENDIX B
Rubric for motivations and volitional strategies for reading

Motivations

1. **Involvement**—Reading to get lost in a story, for the enjoyment of the plot, character development, the language/prose, or format of the story. Showing a genuine interest, or a passion for a type of reading. Experiencing a positive feeling from being engrossed in what they are reading, talking about the good qualities of the book, why they like reading it (e.g., fast-moving, sweeps them into the story, interesting characters, etc.).

2. **Curiosity**—Reading to explore a new topic or to build upon previous knowledge of a topic or personality/character that they are interested in. Reading to answer a question, or to compare competing answers or theories.

3. **Social**—Engaging in interactions with others that promote literacy, such as sharing reading interests with another person, sharing or discussing reading materials, or participating in the reading process with another person by reading to or with them. May also include using reading as a means for spending time with someone.

4. **Investment**—Reading to build experience that will culminate in achieving a long-term goal, such as attending college or becoming a member in a certain type of profession (e.g., “I read a lot of books because I want to be smart and become a science teacher...”).

5. **Challenge**—Being willing to undertake or persist in a reading activity despite the perceived difficulty level of the text. Choosing to read a particular text because it may be more difficult or stimulating than other choices.

6. **Emotional tuning**—Reading to change an existing mood or feeling, such as alleviating sadness or loneliness, beating boredom (very common), or extinguishing a fear. Reading to unwind mentally, release tension, or relax after hard work. Reading jokes, riddles, brain-teasers, or funny comics for the purpose of being amused.

7. **Compliance**—Reading to meet a goal or expectation set by someone else. Completing assignments set by the teacher. Reading to conform to the behavior of classmates/peers, reading to finish a task without extension or exploration beyond the original limits of the task.

8. **Recognition**—Reading to be known as a competent or avid reader. Reading to increase status among teachers, peers, and others. Reading to be a successful participant in a drive or contest geared towards consuming books.

9. **Grades**—Reading to achieve a certain score on an exam, to receive a desired letter grade. Reading to attain a prestigious level of academic achievement or honor roll status.

10. **Rewards**—Reading to gain desirable privileges in the classroom or at home. Rewards for reading can be tangible like books, gold stars, stickers, and treats or intangible like praise, free-choice time, or attention from a teacher/family member.

11. **Competition**—Reading to be a better reader than other people. Reading to amass more information or resources than others.

12. **Utilitarian**—Reading to learn a procedure or rules for a game, hobby, or craft, including manuals and directions. The how-to is the important aspect of this reading.

13. **Work avoidance**—Reading to avoid (more) work. Using reading as a buffer to avoid punishment or unpleasant consequences. Combining reading assignments/activities to minimize reading commitments.

14. **Reading efficacy**—Feeling that reading behaviors are completely under one’s own control (e.g., I choose what I read, when, where, and how). Perceiving that there are choices about when, where, and how to read. Believing that one can read independently. Confident in one’s own abilities.

Volitional strategies

1. **Spending/managing time**—Investing in reading as an activity at home, choosing to read during free time at school (other than Drop Everything And Read or DEAR time) when there are other possibilities (like drawing or computer time). Scheduling a time for reading that fits around the other activities of daily life at home and at school. Having a particular place where literacy activities occur, such as a room or specific area of a home or classroom. Having a system to go about reading, with a time, place, and situational factors (listens to music while reading, etc.) Some children give responses with several situational components.

2. **Finding/keeping materials**—Having knowledge of where to obtain reading materials, borrowing from a library, trading with peers, buying from a store or ordering books from a club, subscribing to magazines, etc. Also, includes knowledge of how to retain materials such as renewing a book or keeping a collection of their reading materials.

(continued)
3. **Coping with distractions**—Maintaining a comfort level for engaging in reading, asking for quiet, tuning others out, changing the place to read if necessary, getting the help of an adult to enforce quiet, etc.

4. **Interpreting text**—Trying to decipher the form and content of the reading by clue reading in context, using imagery or illustrations, sounding out difficult words, rereading texts, or asking another person for help.

5. **Browsing for books**—Deciding what to read, and what not to read by perusing the shelves, scanning book jackets for reviews, comparing titles, replacing a book that is too hard or unavailable. Showing a keen knowledge of the organizational system or labeling of a classroom bookshelf or library/bookstore.

6. **Communicating to others**—Having successful methods for telling other people about experiences with literacy, discussing plot turns, characters, etc. Sharing these experiences may be through speaking or writing.

7. **Finishing text**—Indicating an expectation to complete the materials and finish books.

8. **Succumbing to obstacles**—Describing something that prevents literacy from happening (e.g., my parents can't take me to the library, homework takes up all my free time for reading). Not overcoming this obstacle.
APPENDIX C
Rubric for coding engagement in performance assessment

**Stating prior knowledge**
1. *No conception*—Student writes nothing at all or the answer does not contain information relevant to the question.
2. *Preconception*—Student may list objects or parts and their functions may be vaguely described; the answer is scientifically incorrect but demonstrates an understanding that there are relationships among objects or events relevant to the concept.
3. *Partial conception*—Student answer is scientifically correct and shows a limited understanding of some relationships among a few of the relevant objects or events, but the statements are vague.
4. *Incomplete conception*—Student answer is scientifically correct, shows an understanding of relationships among many but not all of the relevant objects or events, and the relationships are clear but incomplete.
5. *Full conception*—Student answer is scientifically correct, shows an understanding of relationships among all important objects or events, and the relationships are depicted in clear and complete form.

**Searching**
1. *No search*—No evidence of search or selection of materials.
2. *Minimum*—Students choose at least two relevant packets and some irrelevant ones, take good notes from one packet and give one clear reason for choosing a packet.
3. *Moderate*—Students choose at least three relevant packets and very few irrelevant ones with appropriate reasons for their selections and good notes on two packets.
4. *Adequate*—Students choose at least four relevant packets with few or no irrelevant ones, giving clear reasons for all their selections and clear notes.
5. *Proficient*—Students select all of the relevant packets with no irrelevant ones, and all of their notes are related to the theme. Their reasons for choosing packets are diverse, and their notes show they learned during the course of the reading and note-taking activity.

**Writing**
Use same coding categories as stating prior knowledge.

**Conceptual transfer**
1. *No solution*—No answer is given.
2. *Presolution*—Solution is scientifically incorrect, or the solution is not relevant to the problem; some conceptual knowledge of the topic is evident.
3. *Partial Solution*—Some objects are present, but the concepts are not applied to solving the problem; solution is scientifically correct, but the answer is vague or incomplete.
4. *Incomplete solution*—All objects and/or events are present, and the concepts are related to solving the problem, but the answer is incomplete or vague.
5. *Full solution*—All objects and events are present. The concepts are fully applied, and the answer is complete.

**Informational text comprehension**
1. *No answer*—No answer is given. The answer relies on prior knowledge not related to the text; or information is incorrect, nonspecific, or verbatim copy.
2. *Accurate*—Response accurately integrates information from two or more parts of the text.
3. *Elaborated*—Response connects an integrated statement with additional information in the text that elaborates, explains, or contextualizes the statement.

**Narrative interpretation**
Quality of narrative interpretation was judged with a rubric based on response to all of the questions. Student responses to the reproductive, explanatory, and open-extension questions were rated as appropriate (accurate and text-based) or elaborated (embellished with details and characteristics). The scoring scheme was:
1. No appropriate responses
2. One appropriate response
3. Two appropriate responses
4. Three appropriate responses
5. Three appropriate responses and at least two elaborated responses

**Drawing**
Use same coding categories as stating prior knowledge.