INTERNATIONAL LITERACY ASSOCIATION READING RESEARCH QUARTERLY

Early Oral Language Comprehension, Task Orientation, and Foundational Reading Skills as Predictors of Grade 3 Reading Comprehension

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ABSTRACT

The present five-year longitudinal study from preschool to grade 3 examined the developmental associations among oral language comprehension, task orientation, reading precursors, and reading fluency, as well as their role in predicting grade 3 reading comprehension. Ninety Finnish-speaking students participated in the study. The students' oral language comprehension (vocabulary knowledge, listening comprehension, and inference making) and task orientation were assessed in preschool, kindergarten, and grade 3. Reading precursors (letter knowledge and phonological awareness) were assessed at the first two timepoints and reading fluency at the third timepoint. Structural equation modeling showed that oral language comprehension, reading fluency, and task orientation each contributed uniquely to concurrent reading comprehension, and together they accounted for 76% of variance in reading comprehension. A reciprocal relationship was found between oral language comprehension and task orientation from preschool through kindergarten to grade 3, a finding that extends our knowledge of the longitudinal determinants of reading comprehension.

Ample evidence suggests that reading comprehension is based on two basic components: word decoding (or code-related reading precursors) and oral language skills (e.g., Dufva, Niemi, & Voeten, 2001; Hoover & Gough, 1990; NICHD Early Child Care Research Network, 2005; Storch & Whitehurst, 2002). Whereas skills such as phonological awareness and letter identification allow young readers to decode individual words, oral language skills such as vocabulary (Perfetti & Stafura, 2014; Silvén, Poskiparta, Niemi, & Voeten, 2007) and narrative comprehension (Paris & Paris, 2003) lay the foundation for deciphering meaning from text. Although previous reading research has gone a long way toward refining our understanding of the interrelations of and directionality between the skills underlying comprehension (Kendeou, van den Broek, White, & Lynch, 2009; Storch & Whitehurst, 2002), evidence is scant about how these skills predict later reading comprehension starting from an age well before formal reading instruction.

The aforesaid is in agreement with the influential simple view of reading (Gough & Tunmer, 1986; Tunmer & Chapman, 2012). However, critics have pointed out that that such a two-component model is insufficient because it ignores strategic control (Stahl, Kuhn, & Pickle, 1999), a component that is compatible, for example, with

Reading Research Quarterly, 51(4)
pp. 373–390 | doi:10.1002/rrq.145

recent research on executive functions and goal-directed behaviors (Cartwright & Guajardo, 2015) needed to propel reading for meaning. In the same vein, Aaron, Joshi, Gooden, and Bentum (2008) argued that students' reading performance is affected not only by cognitive factors but also by behavioral, affective, and sociocultural factors. In fact, intervention studies have shown the benefits of the combined training of both reading comprehension and motivational strategies as opposed to focusing on either one alone (Guthrie, McRae, & Klauda, 2007; Lehtinen, Vauras, Salonen, Olkinuora, & Kinnunen, 1995). As a response, the present study focuses on two questions. First, how early before kindergarten age is it possible to see the interplay involving precursors of reading ability, oral language comprehension, and a young reader's way of approaching the task at hand? Second, how is this interplay reflected in reading comprehension in primary school?

Oral Language Comprehension Skills and Reading Comprehension

When a reader constructs a coherent mental representation of a narrative, a number of cognitive skills are at work at the word, sentence, and text levels (Kintsch, 1998; Perfetti, Landi, & Oakhill, 2005). Among such skills are activation of word meanings, understanding sentences, making inferences, monitoring comprehension, and understanding text structure (Kim & Phillips, 2014; Oakhill, Cain, & Elbro, 2015; van den Broek et al., 2005). These skills are developmentally related starting at least from age 4 (Lepola, Lynch, Laakkonen, Silvén, & Niemi, 2012), and they contribute to understanding explicit and implicit information in stories that children read, listen to, or view (Florit, Roch, & Levorato, 2011; Oakhill & Cain, 2012).

It has been suggested that children start to understand complex narratives from 4 years of age (Bruner, 1990). Specifically, children's ability to infer characters' thoughts, goals, and actions while listening to narratives or watching audiovisual material predicts their comprehension (Kendeou, Bohn-Gettler, White, & van den Broek, 2008; Paris & Paris, 2003; Tompkins, Guo, & Justice, 2013). Even a causal relationship has been indicated by longitudinal (Oakhill & Cain, 2012) and intervention studies (Paris & Paris, 2007).

Valid inferences cannot be made in the absence of understanding words and individual concepts in a text. Thus, vocabulary knowledge is paramount to listening and reading comprehension (Florit, Roch, & Levorato, 2014; Ouellette, 2006; Torppa et al., 2007), as it supports word-to-text integration (Perfetti & Stafura, 2014). In fact, Silva and Cain (2015) showed among 5–6-year-olds that inference making from and literal comprehension of a pictorial story fully mediated the effect of vocabulary knowledge on reading comprehension measured one year later. In line with these findings, oral language comprehension was conceptualized in the present study as consisting of vocabulary knowledge, memory for narrative, and inference making (see also Kendeou, van den Broek, et al., 2009).

In spite of increased attention, the developmental relationship between oral language comprehension and code-based reading precursors is not completely understood, and some findings are contradictory. Those by Storch and Whitehurst (2002) pointed to the developmental independence of these factors, whereas Kendeou, van den Broek, et al. (2009) reported a significant cross-lagged association from oral language to later decoding. In addition, studies with Finnish- and Dutch-speaking children have shown that oral language comprehension and decoding are related to later reading comprehension but do not seem to contribute to each other during the early school years (Dufva et al., 2001; Verhoeven & van Leeuwe, 2008). Kendeou, van den Broek, and associates had two cohorts, one from preschool to kindergarten and another from kindergarten to grade 2, and therefore were not able to study the predictive validity of preschool oral language comprehension for reading comprehension. Storch and Whitehurst included receptive and expressive vocabulary and narrative retelling in their oral language at age 4 but did not examine the development of narrative comprehension skills and their role in reading comprehension. The NICHD Early Child Care Research Network (2005) reported such a prediction until grade 3, but the development of oral language comprehension was not examined. Moreover, recent research suggests that goal-oriented behaviors such as planning, organizing, and self-monitoring are needed when comprehending a text (Denckla et al., 2013). Such factors were not considered in the above-mentioned studies.

Developmental Dynamics of Task Orientation, Executive Functions, Reading, and Comprehension Skills

Whitehurst and Lonigan (1998) defined precursors of reading and writing as "the skills, knowledge and attitudes" (p. 849) that form the foundation for later literacy. In the present study, *task orientation* is used as an umbrella term for a child's tendency to accept challenging aspects of a learning task. This, in turn, is observed as approaching, exploring, and mastering behaviors. The conceptualization of task orientation was inspired

by an older model depicting the child's adaptive behaviors in teacher-guided performance situations (Lehtinen et al., 1995; Lepola, Poskiparta, Laakkonen, & Niemi, 2005). Recently, Conradi, Jang, and McKenna (2014) offered a hierarchical model consisting of nine interrelated motivational terms pertinent to reading. They also provided consensus definitions of each term. Although Conradi et al.'s model is more comprehensive than Lehtinen et al.'s, a substantial overlap can be seen concerning the terms, such as *goals*, *self-efficacy*, *agency*, *attitude*, and *expectancy*. Vauras, Salonen, Lehtinen, and Lepola (2001) described task orientation as a pursuit of task-intrinsic goals (*goals*), such as gaining task-related understanding and sense of competence (*self-efficacy*). Concentration on the task at hand, positive emotional expressions that are related to the task (*attitude*), and persistence (*agency*) exemplify task orientation. Finally, according to Lehtinen et al., at least a moderate expectation of success is inherent in task-oriented behaviors.

Our notion of task orientation is also in agreement with aspects of executive functions such as planning, as well as attentional and behavioral control. These executive skills enable sustained engagement with a learning task and predict achievement in beginning reading, narrative comprehension, and reading comprehension (Cartwright & Guajardo, 2015). For example, van de Sande, Segers, and Verhoeven (2013) showed how word decoding in grade 1 was affected by an interplay between attentional and behavioral control and phonological awareness assessed in kindergarten. Similarly, Lan, Legare, Cameron Ponitz, Li, and Morrison (2011) found that attentional control was significantly associated with letter and word identification performance among 3.5–5.5-year-old children, thus supporting the role of focused attention in the acquisition of word decoding. Based on teacher perceptions of students' task-oriented behavior in the classroom, Lepola et al. (2005) showed that letter knowledge, phonological awareness, and task orientation were interrelated from preschool (age 5) to kindergarten (age 6), with both foundational reading skills and task orientation uniquely predicting grade 1 word reading (see also Manolitsis, Georgiou, Stephenson, & Parrila, 2009).

Regarding the early interplay of executive and meaning-making skills involved in oral language comprehension, McClelland et al. (2007) found that behavioral regulation tapping inhibitory control, working memory, and attention predicted vocabulary knowledge across the prekindergarten year. Strasser and del Río (2013) further showed that teacher-rated attention correlates with narrative story comprehension among kindergartners even when the effects of vocabulary, inference making, and comprehension monitoring were controlled for. Lepola (2004) found that deteriorating task orientation and increasing helplessness behavior from kindergarten to grade 1 was related not only with poor foundational reading skills but also with weak listening comprehension.

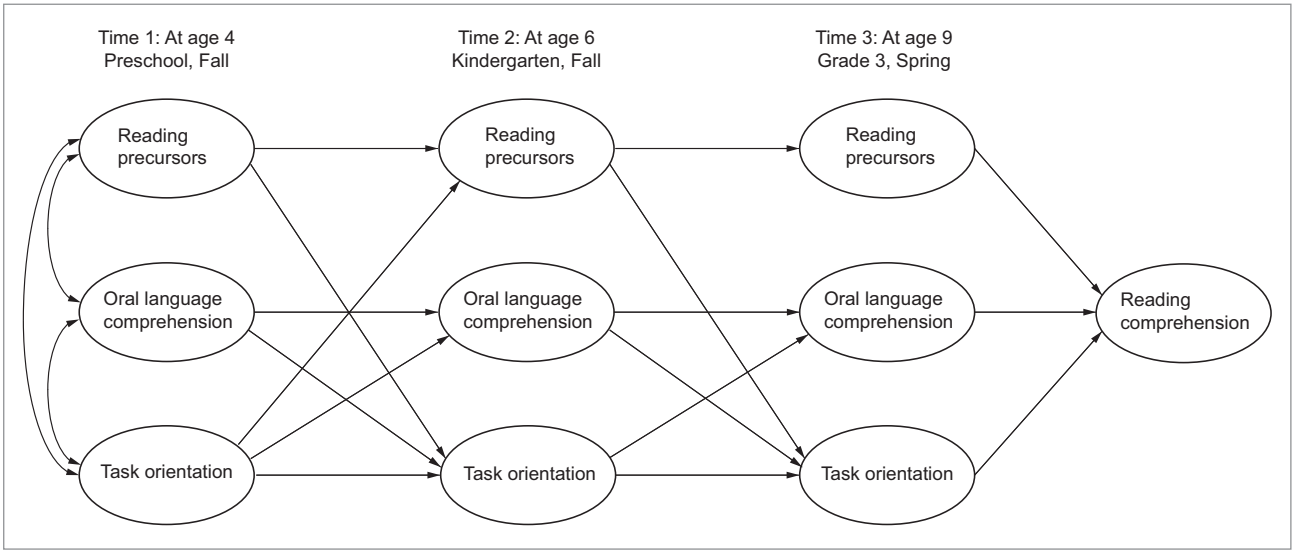
Evidence suggests that task orientation and reading comprehension are interrelated across the elementary school years (Poskiparta, Niemi, Lepola, Ahtola, & Laine, 2003). Hirvonen, Georgiou, Lerkkanen, Aunola, and Nurmi (2010) showed that kindergarten task-focused behavior rated by the teacher was a unique predictor of grade 4 reading comprehension. Moreover, reading comprehension and reading fluency in grade 1 were significantly related to grade 4 task-focused behavior. In addition, teacher-rated task avoidance and students' reading comprehension are found to be reciprocally related to each other from grade 4 to grade 5 (Georgiou, Manolitsis, Zhang, Parrila, & Nurmi, 2013). When applied in the context of reading, intrinsic and extrinsic motivations (Schaffner, Schiefele, & Ulferts, 2013), such as involvement, compliance, and work avoidance, have been shown to be associated with the growth of reading comprehension (Guthrie et al., 2007). However, to our knowledge, no studies have examined whether all three (i.e., task orientation, oral language comprehension, reading precursors) are developmentally associated with one another from preschool onward and whether they contribute to reading comprehension in grade 3.

Aims and Hypotheses

The present five-year study had two aims. First, we examined the longitudinal and concurrent roles of task orientation, oral language comprehension, reading precursors, and reading fluency in the prediction of reading comprehension in grade 3. In line with the above-mentioned literature and a recent study (Cartwright, Marshall, & Wray, 2016), we hypothesized that task orientation, oral language comprehension, reading precursors, and reading fluency are longitudinally and concurrently contributing to grade 3 reading comprehension (see Figure 1).

Second, we investigated whether oral language comprehension, reading precursors, and task orientation follow independent pathways or whether they are reciprocally related to one another from preschool to grade 3. Following Storch and Whitehurst (2002), we hypothesized that oral language comprehension and reading precursors would not show cross-lagged effects on each other. However, we predicted a reciprocal relationship between reading precursors and task orientation from age 4 to age 6 (Lepola et al., 2005; van de Sande et al., 2013). Further, because good foundational reading skills lead to fast reading acquisition in school, they are likely to foster students' interest in new tasks.

FIGURE 1
Conceptual Model of the Developmental Associations Among Oral Language Comprehension, Reading Precursors, Reading Fluency, and Task Orientation From Preschool to Grade 3 in Predicting Reading Comprehension in Grade 3



Therefore, we assumed a link between reading precursors at age 6 and task orientation in grade 3. We also assumed that oral language comprehension and task orientation would be reciprocally related before school age (Lepola, 2004; Strasser & del Río, 2013) and in primary school (Lehtinen et al., 1995). The demands of scholastic tasks are gradually growing, and in grade 3, they tax not only the student's comprehension skills and reading fluency but also the student's ability to maintain attention to the tasks and teacher discourse.

Figure 1 shows a conceptual model of the associations among the latent variables. Structural equation modeling was used to examine the developmental associations between the latent factors and their concurrent and longitudinal roles in predicting reading comprehension.

Method

Participants

Ninety Finnish-speaking students (50 girls and 40 boys) participated in the study. They had also participated in a previous study in which 135 typically developing Finnish children were followed from age 4 (time 1: preschool) to age 6 (time 2: kindergarten). When the children were 9–10 years of age (time 3: grade 3), contact could be established with 118 families, and parental permission was asked for their child to participate in the study in grade 3. The attrition was principally due to families moving. Four students were excluded because of their grade failure or referral to special education. Ninety parents (76%) gave written consent. At the beginning of the longitudinal study, the mean age of the children was 50.5 months (range = 45–56 months). In the previous study, the children were in 16 different daycare centers located in socioeconomically varied districts in two towns with 176,000 and 14,500 inhabitants, respectively. In grade 3, the 90 participating students were in 17 different elementary schools (26 classrooms). Based on a questionnaire filled out by the mothers, 18% of them had a master's degree, 53% had a bachelor's or vocational college degree, 22% had vocational education or a high school diploma, and 7% had no vocational education. Corresponding figures in the Finnish female population were 17%, 39%, 37%, and 7%, respectively (Myrskylä, 2009).

The children and their families were compared with the students ($n = 45$) who did not participate in grade 3. *T*-tests for independent groups showed that there were no significant differences in oral language comprehension (vocabulary, listening comprehension, and inference making), reading precursors (letter knowledge and initial phoneme recognition), or gender distribution between the participating and nonparticipating groups in preschool and kindergarten (all $t < 1.4$). However, the children in the participating group were rated by kindergarten teachers as showing more task-oriented behaviors (mean [*M*] = 3.96, standard deviation [*SD*] = 1.60), as compared with the attrition group ($M = 3.37$, $SD = 1.14$), $t(132) = 2.20$, $p < .05$, Cohen's $d = 0.40$. There were no significant differences between the attrition group and the participating group in the distribution of the mothers' educational level.

Materials and Procedure

At time 1 (age 4) and time 2 (age 6), letter knowledge, phonological awareness, vocabulary, listening comprehension, and inference making were assessed individually from September to November in two sessions, both lasting about 30 minutes. The order of presentation of the tasks was the same at times 1 and 2. In the first session, we examined children's letter knowledge, phonological awareness, vocabulary, and listening comprehension. In the second session, we assessed inference making.

At time 3 (from February to March in grade 3; age 9), the students' listening comprehension, inference making, text-reading speed and accuracy, and reading comprehension were assessed individually, in the aforementioned order, during the first session, lasting about 40 minutes. After four to five weeks, reading comprehension was assessed again in a small-group setting.

Students' verbal responses in all tasks, except for letter knowledge, phonological awareness, and reading comprehension, were recorded with an MP3 player for later transcription and scoring. Task orientation was assessed by preschool, kindergarten, and grade 3 teachers. Only four out of 24 teachers who assessed the students at time 1 were the same at time 2.

Preschool and Kindergarten Measures

Reading Precursors

To assess letter knowledge, students were asked to name 29 uppercase letters shown one at a time (Lerkkanen, Poikkeus, & Ketonen, 2006). The score was the number of correctly named letters. Cronbach's α for the task was .96 at time 1 and .94 at time 2.

Phonological awareness was evaluated by rhyme and alliteration tasks at age 4 (time 1; Silvén, Niemi, & Voeten, 2002). Scores for both tasks were the number correct out of 10 items. Cronbach's α was .80 for rhyming and .77 for alliteration. Scores were significantly correlated ($r = .35$, $p < .001$). At age 6 (time 2), an initial phoneme recognition test was given (Lerkkanen et al., 2006). Cronbach's α was .70. The independent predictive validity of rhyming (i.e., the identification of spoken words that end with a common sound pattern) has been questioned for English-speaking students (for a detailed discussion, see Gillon, 2004). It is plausible that its role is limited to being a prerequisite of more advanced phonological skills, such as phoneme segmentation. However, the Finnish language is known for its nearly perfect sound-to-print regularity. There is a predictable continuity in phonological skills from larger to smaller units. Silvén, Poskiparta, and Niemi (2004) compared two groups of 4-year-olds: those who became precocious readers before the start of primary school at the age of 7 and those who did not. Performance on onset/rime tasks significantly differentiated the groups.

Oral Language Comprehension Skills

These skills were assessed by vocabulary knowledge, narrative listening comprehension, and inference-making tests. A word definition test was used to assess students' vocabulary knowledge at times 1 and 2. The test was an adaptation of the vocabulary test (Silvén & Rubinov, 2010) in the third edition of the Finnish Wechsler Intelligence Scale for Children (Wechsler, 1999). Cronbach's α was .82 at times 1 and 2.

Narrative listening comprehension was assessed at times 1 and 2 by a listening comprehension test developed by Vauras, Mäki, Dufva, and Hämäläinen (1995). We used parallel narratives at time 1 (e.g., "Misi Cat Goes Hunting"; Vauras & Friedrich, 1994) and time 2 (e.g., "Molli Cat is Catching"; Vauras & Friedrich, 1994). The texts were 91 words long and comparable in terms of linguistic properties and macrostructure. The narratives at times 1 and 2 consisted of the following sequence of events: character introduction, setting, initiating event, reaction, attempt 1, problem, attempt 2, solution, and outcome reaction (Lepola et al., 2012,). In the testing, the experimenter introduced the narrative by saying, "I will read you a story that is about Misi cat. The story tells about when Misi cat was hunting." Then, the student was instructed to listen carefully to be able to tell about the story afterward. The experimenter read the text aloud twice without stressing any of the main story elements.

Listening comprehension was evaluated by a retelling task and four prompted questions. In the retelling, the student was asked to tell as much of the story as possible. If the student did not retell anything, the experimenter encouraged him or her by a prompt: "You can tell a little about things that happened in the story." Every student's retelling was also prompted by asking, "Does anything else come to your mind?" The phrases in the retellings were categorized according to nine narrative elements. Six of those elements were based on Mandler and Johnson's (1977) story grammar framework, and three additional elements were included to get a more detailed picture of students' story comprehension. Retelling scores ranged from 0 to 9. Inter-rater reliability was assessed by percentage agreement (i.e., the number of agreements between two independent raters was divided by the total number of responses). All responses were scored for reliability at time 1 and approximately 50% of the responses at time 2. Agreements in retellings were 98% at time 1 and 94% at time 2. Answers to the prompted questions (e.g., "Why did the cat jump?" "How did the story end?") were scored on a scale of 0–2, yielding a maximum score of 8.

Inter-rater agreement was calculated for every question. The mean agreements across questions were 98% at time 1 and 89% at time 2. The retelling and the prompted questions scores (r = .46 at time 1, r = .47 at time 2, r = .62 at time 3) were summed to obtain listening comprehension composites.

To assess inference making, we used the narrative picture book viewing method by Paris and Paris (2003). The picture book *Robot-bot-bot* by Fernando Krahn (1979) was used at times 1 and 2. After the student viewed the picture book, the experimenter closed the book and asked him or her to retell as much of the story as possible. After the retelling, the experimenter and the student went through the story together, and the experimenter asked 10 questions. Five of the questions were explicit and the other five implicit, requiring the ability to make an inference. In the present study, we used data from the implicit questions, about the characters' feelings, causal relations, dialogue, predictions, and the theme of the story. The first three questions tap cohesive inferences to establish links between the picture (event) in view and the other semantically related events. The prediction question measured the student's ability to make elaborative inferences (Oakhill et al., 2015), whereas the theme question required that previously acquired world knowledge be incorporated with the information given by the picture book (Graesser, Singer, & Trabasso, 1994).

Each question was scored on a scale of 0–2 (for questions of causal inference and feelings, see Appendix A, which is available as supporting information for the online version of this article). More points were given for an answer when a student integrated information across pages and made connections among the events (Paris & Paris, 2003). To receive 2 points, the student had to refer to at least two other pictures or relate a more global meaning to the picture viewed. The agreement by two independent coders was calculated for each implicit question. It was above 87% for every question, with a mean of 97% for time 1 and 91% for time 2. Because of the small number of questions, a summed score (maximum 10) of the five inference questions was used.

Task Orientation

Preschool and kindergarten teachers were asked to evaluate the behavior, attention, and emotional expressions of each participating student in their class. Teachers rated the students in November 2007 in preschool and November–December 2009 in kindergarten. Each teacher was asked first to recall playlike and crafts situations and new task activities that the student was asked to perform by the teacher, and then rate the student's behavior using a 7-point Likert-type scale that ranged from "the behavior does not occur at all" to "the behavior occurs most of the time or always." The written instructions underscored that "the focus of assessment is not free-play or the child's linguistic abilities but the way the child adapts to the situation guided by an adult." In addition, the first author discussed the purpose of the assessment with each rater either personally or by phone.

Preschool and kindergarten teachers used the items belonging to the Child Behavior and Motivation questionnaire (Lepola, Laitinen, & Kajamies, 2013). In this study, three task orientation items out of 10 were used: concentrates on crafts and playlike tasks, shows a desire to do more challenging things, and ponders alternatives and plans for what he or she does. These items were chosen because they have been shown to load on one and the same factor from 4 to 6 years of age. The other task-oriented items were excluded because of significant cross-loadings (for reliability and validity, see Lepola et al., 2013). Cronbach's α was .68 for preschool data and .75 for kindergarten data.

When the participants were 4 years old, behavioral regulation scores derived from the head-to-toes task (Cameron Ponitz et al., 2008) were significantly related to teacher report of task orientation (r = .20) and cognitive regulation (r = .34), such as independent management of instructions including at least two steps (Lepola, Avikainen, Annevirta, & Mikkilä-Erdmann, 2008). Our previous study, in which children's task-oriented behaviors were observed in challenging playlike LEGO construction tasks (Poskiparta et al., 2003), provided evidence for the validity of kindergarten and elementary teachers' ratings of students' task orientation. Also, a validation study by Zhang, Nurmi, Kiuru, Lerkkanen, and Aunola (2011), based on five items, showed that teacher-reported task avoidance was associated with poor reading performance from the fall of grade 1 to the spring of grade 2.

Grade 3 Measures

Oral Language Comprehension Skills

These skills were assessed by listening comprehension and inference-making tests in grade 3. We used a subtest of the YTTE test (Kajamies, Poskiparta, Annevirta, Dufva, & Vauras, 2003) to assess listening comprehension. This assessment consists of a retelling task and prompted questions. Students' retellings and answers to the questions were transcribed verbatim. The phrases in the retellings were categorized according to 12 narrative elements. Six of the 12 elements were based on Mandler and Johnson's (1977) story grammar framework, and six additional elements (e.g., characters' reactions, topic shift) were included to get a more detailed picture of the students' memory for narrative about

"Tuisku, the Wild Stallion, Flees the Hunters" (Vauras & Friedrich, 2003). One point was given for phrases referring to information from each story element (see Appendix B, which is available as supporting information for the online version of this article). Six prompted questions tapped memory for the initiating event, characters' goals and means, outcome, characters' reactions, and the ending. Three of the six questions were scored on a scale of 0–3. For instance, for the question "What does Horse Tuisku do when seeing the hunters?" 3 points were given for an answer referring to both the protagonist's reaction and the goal-means sequence (e.g., "She neighed and began to search for an escape route"). Two points were given for an answer referring to either the reaction (e.g., "She was frightened") or the means (e.g., "She searched for an escape"), and 1 point was given for a less accurate answer (e.g., "She escapes"; "She starts to run"). Thirty percent of responses were scored for reliability. Inter-rater agreement was 89% for retellings and 94% for questions.

The picture book *A Boy, a Dog and a Frog* by Mercer Mayer (1967) was used at time 3 to measure inference making. Otherwise, the procedure was the same as that in preschool and kindergarten. Inter-rater agreement was 94%.

Reading Fluency

Reading fluency was assessed by a 78-word narrative text adapted from a reading test battery (Lindeman, 2000). Students were asked to read the text aloud in the way they usually do. The read-alouds were audiotaped. The average time per decoded word measured text reading speed, and the total number of incorrectly read words indicated reading accuracy.

Reading Comprehension

Two narrative texts from the same nationally normed reading test battery (Lindeman, 2000) were used to assess reading comprehension in grade 3. Students were asked to read a story silently and then answer 12 multiple-choice questions, for a total of 24 questions for the two stories. The first narrative contained 112 words and the second 188 words. Students could refer to the text for the entire duration of the test. Six questions assessed literal text comprehension (e.g., fact finding, directly expressed detail), and 18 questions evaluated inferential text comprehension (e.g., inference making beyond the sentence level, deriving word meaning, identifying the main idea or theme of the story). In the present study, we focused on inferential questions because of their relevance in theoretical models of reading and narrative comprehension (Perfetti et al., 2005; van den Broek et al., 2005). In addition, the distribution of literal scores was skewed: 27% of the scores hit the ceiling. One point was given for each correct answer (maximum 18). Kuder–Richardson reliability was .75 for the present data.

Task Orientation

In the spring of grade 3 (February–March), classroom teachers were asked to rate students' task orientation using an age-appropriate motivation questionnaire (Kajamies, Vauras, & Kinnunen, 2010). Each teacher was asked to think about how the participating student typically behaved in classroom learning situations and then rate the student's motivation on the basis of the teacher's experience. Teachers had three to four weeks to assess each student. The questionnaire included 15 items, and six out of 15 items tapped task-oriented behavior. Three of the six statements were selected for the present study because of their semantic overlap with the times 1 and 2 assessments and the higher stability of task orientation as compared with the use of all six statements. The following three items were retained: tries to solve problems independently; tries to figure out inconsistencies or difficulties related to the texts, teaching, or communication; and ponders how things fit together. Cronbach's α for task orientation was .85. Kajamies, Salonen, Vauras, Laakkonen, and Junttila (2013) have shown among 500 Finnish-speaking students that these three items load on a task orientation factor, and this disposition is relatively stable from grade 4 to grade 5. In this study, we computed a confirmatory factor model to assess convergent validity of the task orientation statements.

Data Analysis

The analyses were computed using M*plus* (version 6; Muthén & Muthén, 1998–2011). The parameters of the models were estimated using the full-information maximum likelihood estimation with nonnormality robust standard errors (Muthén & Muthén, 1998–2011). To test the measurement model (i.e., the hypothesized three-factor structure of the measures for reading precursors, reading fluency, oral language comprehension, and task orientation), we performed confirmatory factor analyses for the measures administered at times 1–3. We then constructed a structural equation model (SEM) to analyze the developmental associations of reading precursors, reading fluency, oral language comprehension, and task orientation and their contribution to reading comprehension.

The goodness of fit of the estimated confirmatory factor and SEMs were evaluated according to the following indicators: chi-square test, comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). According to Hu and Bentler (1999) and Little

(2013), CFI values above 0.95 indicate a good model fit, and values above 0.90 suggest an acceptable fit. In RMSEA, values below 0.05 indicate a good fit, and values from 0.05 to 0.08 suggest an acceptable model fit. SRMR values below 0.08 indicate a relatively good fit between the hypothesized model and observed data (Hu & Bentler, 1999).

Results

Descriptive Statistics

Descriptive statistics for the measures at time 1–3 are shown in Table 1. Inspection of the distribution of individual scores for each measure revealed that six scores were 3 *SD*s above or below the mean, and two of them were detected in the text-reading variables in grade 3. The influence of this small number of outliers was considered to be minimal. Except for text-reading speed and accuracy, the distributional properties of the reading precursors, oral language comprehension, task orientation, and reading comprehension measures did not suggest major deviations from normality.

Table 2 shows the concurrent and longitudinal correlations of the variables we used to define latent factors. Vocabulary knowledge at time 1 was more strongly associated with concurrent listening comprehension than with letter knowledge or phonological awareness. The association between letter knowledge and phonological awareness was modest at age 4 (r = .29) but strong at age 6 (r = .62). Inference making was more strongly associated with vocabulary and listening comprehension than with letter knowledge. Task orientation indicators were found to correlate moderately with

TABLE 1
Descriptive Statistics for Reading Precursors, Oral Language Comprehension, Task Orientation, Text Reading, and Text Comprehension Variables (*N* = 90)

Variable	Mean	Standard deviation	Range	Skewness	Percentage scoring at floor	Percentage scoring at ceiling
Age (months)	50.51	3.52	11	0.03	—	—
Reading precursors						
Letter knowledge, T1 (29)	4.56	6.84	26	1.76	42	0
Letter knowledge, T2 (29)	18.60	9.15	28	−0.52	0	14
Phonological awareness, T1 (10)	4.63	2.10	9	0.01	1	0
Phonological awareness, T2 (10)	8.08	2.09	8	−0.90	0	37
Oral language comprehension						
Vocabulary knowledge, T1 (64)	7.32	4.55	20	0.17	4	0
Vocabulary knowledge, T2 (64)	13.04	5.69	27	−0.22	6	0
Listening comprehension, T1 (17)	5.31	2.63	14	0.59	3	0
Listening comprehension, T2 (17)	8.47	3.10	14	−0.23	0	0
Listening comprehension, T3 (29)	15.06	4.56	22	−0.64	0	0
Inference making, T1 (10)	3.21	1.94	8	0.34	9	0
Inference making, T2 (10)	5.96	2.10	9	−0.25	0	2
Inference making, T3 (10)	7.21	2.00	10	−1.11	1	9
Reading skills (all T3)						
Reading fluency						
Text-reading speed (seconds per word)	0.87	0.35	2.14	2.18	—	—
Text-reading accuracy (number of incorrectly read words)	2.64	3.02	23	3.81	19	—
Reading comprehension						
Inferential questions (18)	13.20	3.23	14	−0.59	0	6

Note. T1 = preschool, at age 4; T2 = kindergarten, at age 6; T3= grade 3, at age 9. The maximum scores for each test are in parentheses.

TABLE 2
Correlations Among the Manifest Variables Included in Structural Equation Modeling (*N* = 90)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Time 1 (preschool, at age 4)																								
1. Letter knowledge	—																							
2. Phonological awareness	.29	—																						
3. Vocabulary knowledge	.35	.22	—																					
4. Listening comprehension	.32	.23	.56	—																				
5. Inference making	.26	.19	.52	.37	—																			
6. TOconc	.01	.11	−.09	.06	.00	—																		
7. TOchall	.15	.13	.14	.11	.07	.31	—																	
8. TOplan	.15	.17	.23	.14	.14	.39	.52	—																
Time 2 (kindergarten, at age 6)																								
9. Letter knowledge	.58	.33	.24	.28	.14	.14	.29	.33	—															
10. Phonological awareness	.36	.41	.20	.25	.21	.12	.16	.21	.64	—														
11. Vocabulary knowledge	.27	.18	.41	.54	.46	.02	.09	.17	.27	.15	—													
12. Listening comprehension	.14	.16	.33	.47	.30	.14	.16	.12	.17	.12	.45	—												
13. Inference making	.16	.10	.36	.37	.37	.08	.20	.22	.16	.11	.52	.62	—											
14. TOconc	.20	.37	.31	.22	.28	.15	.24	.33	.25	.22	.09	.06	.16	—										
15. TOchall	.35	.29	.32	.28	.22	.22	.32	.48	.39	.23	.29	.24	.19	.53	—									
16. TOplan	.23	.13	.38	.36	.20	.18	.32	.37	.34	.23	.27	.27	.32	.44	.53	—								
Time 3 (grade 3, at age 9)																								
17. Text-reading speed	−.28	−.25	−.18	−.20	−.25	−.05	−.15	−.12	−.41	−.30	−.26	−.11	−.27	−.24	−.17	−.16	—							
18. Text-reading accuracy	−.06	−.09	.01	−.02	−.04	.02	.01	−.14	−.31	−.28	−.04	.02	.07	−.14	−.20	−.07	.32	—						
19. Listening comprehension	.30	.24	.28	.29	.31	.03	.15	.05	.39	.25	.38	.37	.52	.23	.30	.34	−.26	−.03	—					
20. Inference making	.18	.06	.22	.21	.15	.07	.48	.31	.30	.18	.35	.43	.50	.19	.30	.32	−.26	−.06	.51	—				
21. TOindep	.10	.32	.30	.18	.19	.03	.25	.18	.39	.29	.15	.29	.32	.37	.12	.21	−.32	−.10	.30	.36	—			
22. TOponder	.25	.31	.32	.18	.20	.03	.14	.15	.38	.27	.27	.29	.22	.28	.18	.19	−.31	−.14	.33	.29	.75	—		
23. TOexplore	.18	.26	.24	.29	.41	.15	.13	.31	.29	.30	.34	.38	.44	.32	.17	.24	−.33	−.10	.34	.28	.62	.61	—	
24. Reading comprehension, inferential	.34	.26	.43	.50	.40	.09	.23	.20	.44	.34	.47	.42	.44	.38	.30	.41	−.48	−.19	.50	.42	.45	.50	.41	—

Note. TO = task-oriented activity: TOchall = shows a desire to do more challenging things; TOconc = can concentrate on crafts and playlike tasks; TOexplore = tries to figure out inconsistencies or difficulties related to the texts, teaching, or communication; TOindep = tries to solve problems independently; TOplan = considers alternatives and plans what he or she does; TOponder = ponders how things fit together. If $|r| > .21$, $|r| > .27$, or $|r| > .34$, then the correlation is significant at the level of $p < .05$, $p < .01$, or $p < .001$, respectively.

each other at times 1 and 2 and strongly at time 3 ($r > .60$).

Because students were nested within classrooms in grade 3, we computed the intra-class correlation coefficient with M*plus* (version 6). The results showed that the between-class variation in reading comprehension was 4.2%. Because the design effect (1.16) was below 2, we did not take clustering into account in the measurement and structural models (Kline, 2011).

Longitudinal SEM

First, before examining the hypothesized associations among the latent variables, we tested the measurement model of oral language comprehension, reading precursors, and task orientation factors at times 1 and 2. At time 3, the measurement model consisted of oral language comprehension, reading fluency, task orientation, and reading comprehension. Indicators for times 1 and 2 oral language comprehension were vocabulary knowledge, narrative listening comprehension, and inference making, whereas indicators for latent reading precursors were letter knowledge and phonological awareness. Latent task orientation was defined by the three indicators at times 1–3. Reading fluency was indicated by two tasks (i.e., reading speed, accuracy). At time 3 (grade 3), the latent oral language comprehension was defined by narrative listening comprehension and inference making, whereas one indicator, inferential questions, was used for latent reading comprehension. Covariances between the latent variables were estimated. The results showed that the fit of the measurement model to data was adequate, $\chi^2(213) = 255.99$, $p = .023$, RMSEA = 0.07, 90% confidence interval (CI) [0.019, 0.068], CFI = 0.946, SRMR = 0.068.

Second, we examined the developmental associations among task orientation, oral language comprehension, reading precursors, and reading fluency from preschool through kindergarten to grade 3, as well as their role in predicting grade 3 reading comprehension. On the basis of theory, the tested SEM 1 included autoregressive paths of oral language comprehension and task orientation from time 1 through time 2 to time 3. An autoregressive path from time 1 to time 2 reading precursors was included, and time 2 reading precursors were assumed to predict time 3 reading fluency. Seven cross-lagged relationships were tested: from time 1 task orientation to time 2 reading precursors, from time 1 task orientation to time 2 oral language comprehension, from time 1 reading precursors to time 2 task orientation, from time 1 oral language comprehension to time 2 task orientation, from time 2 oral language comprehension to time 3 task orientation, from time 2 reading precursors to time 3 task orientation, and from time 2 task orientation to time 3 oral language comprehension. In addition, we hypothesized that concurrent oral language comprehension, reading fluency, and task orientation each contribute unique variance to reading comprehension. The latent factors were allowed to correlate at time 1, whereas residuals of latent factors were allowed to correlate at subsequent timepoints. For the latent reading comprehension factor, we had one indicator. The error variance of reading comprehension was fixed to 1 minus the reliability of the test (i.e., 0.25%).

The statistics indicated that the fit of model 1 to the data was acceptable, $\chi^2(239) = 284.56$, $p = .023$, RMSEA = 0.046; 90% CI [0.019, 0.065], CFI = 0.943, SRMR = 0.074. No modification index exceeded 8.0. However, as Figure 2 shows, four paths were nonsignificant. The nonsignificant cross-lagged paths were removed from model 1 one by one. Except the path from time 2 task orientation to time 3 task orientation, the final model 2 included only the statistically significant paths. The fit of the final model 2 to the data was acceptable: $\chi^2(242) = 288.79$, $p = .021$, RMSEA = 0.046, 90% CI [0.00, 0.066], CFI = 0.941, SRMR = 0.075. Because the theoretical model 1 and the final model 2 were nested, we compared them in terms of their overall fit. The chi-square test showed that the two models did not differ significantly, $\chi^2_{diff}(3) = 4.368$, $p = .224$. Therefore the more parsimonious model 2 was retained as the final model. The results of model 2 are shown in Figure 3.

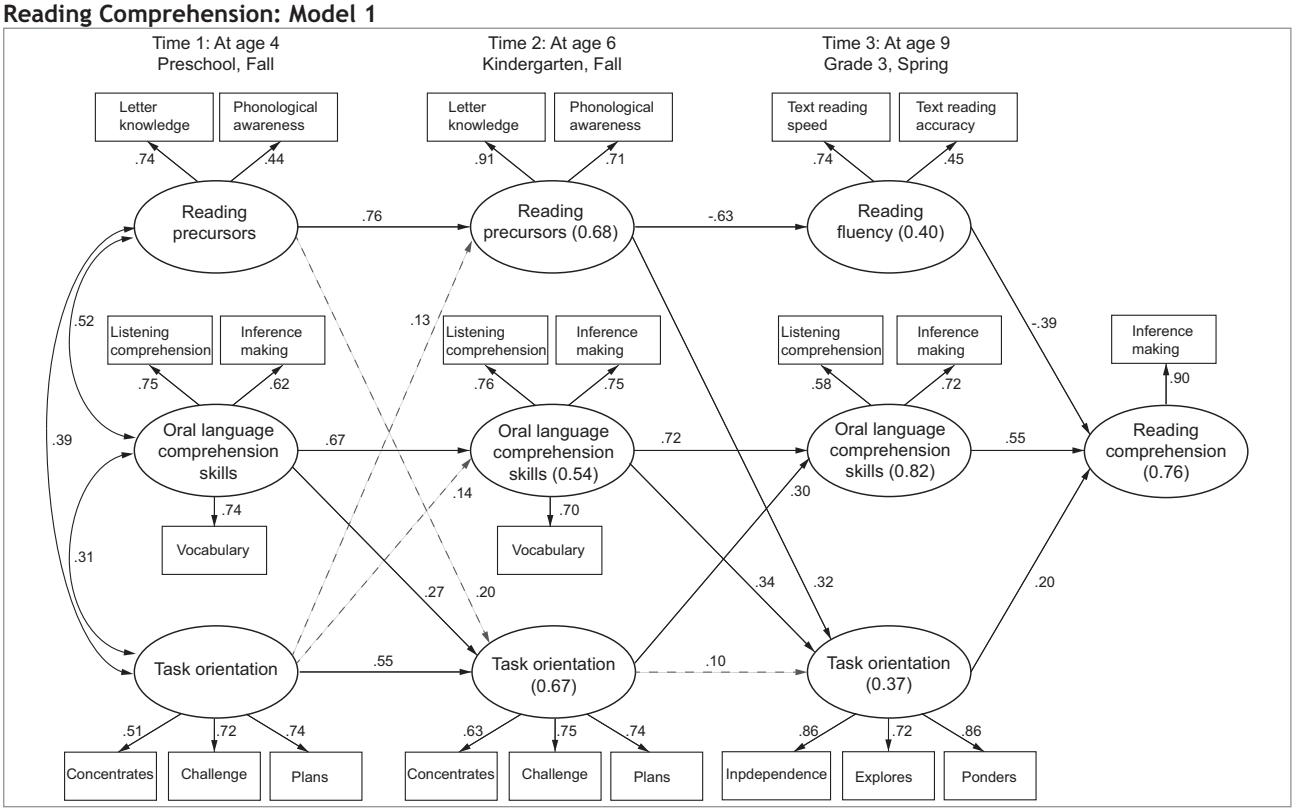
Testing an Alternative Model

Although the final model 2 produced an acceptable fit to the data, it is possible that the data support another model holding a different stance, in particular, on the development of comprehension and basic reading skills. With support by Kendeou, van den Broek, et al. (2009), the alternative model that we tested also included cross-lagged paths between oral language comprehension and reading precursors, as well as the relation between oral language comprehension at time 2 and reading fluency at time 3. The overall fit of the alternative model was good, $\chi^2(238) = 280.84$, $p = .029$, RMSEA = 0.045, 90% CI [0.00, 0.064], CFI = 0.95, SRMR = 0.074. However, none of the cross-lagged paths added between oral language comprehension and reading precursors or between text-reading skills and oral language comprehension was significant. Thus, the final model 2 was retained on the basis of theoretical and empirical grounds.

The Results of the Final Model (Figure 3)

Correlations among the latent variables from the final model are presented in Table 3. All correlations were statistically significant. The stability of reading

FIGURE 2
The Development of Oral Language Comprehension, Reading Precursors, and Task Orientation in Predicting Reading Comprehension: Model 1



Note. Standardized parameter estimates (factor loadings and regression coefficients) were estimated by *Mplus* (the amount of variance explained in the latent factor is shown in parentheses). All paths displayed as solid lines are significant at $p < .05$ (two-tailed).

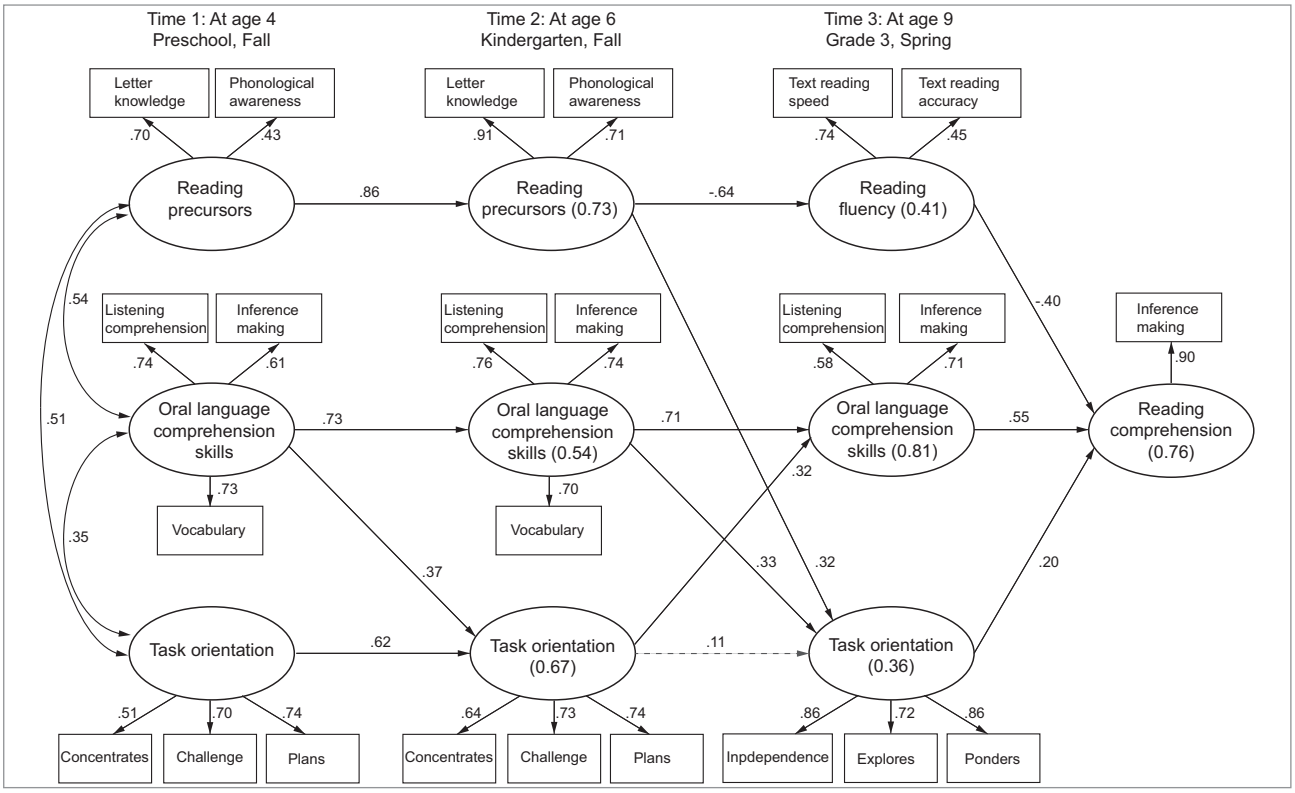
precursors from preschool to kindergarten and the stability oral language comprehension from preschool through kindergarten to grade 3 are evident from these data. The stability of task orientation was high from preschool to kindergarten (.75) but lower, albeit statistically significant, from kindergarten to grade 3 (.40).

The final model shows, first, that in preschool (time 1), oral language comprehension is more strongly associated with reading precursors than with task orientation. Second, regarding the developmental associations among oral language comprehension and task orientation, Figure 3 shows that both preschool task orientation and oral language comprehension contributed to kindergarten (time 2) task orientation. Oral language comprehension in grade 3 (time 3) was predicted by kindergarten oral language comprehension and task orientation, whereas grade 3 reading fluency was determined solely by kindergarten reading precursors. Third, as predicted, concurrent measures of oral language comprehension, reading fluency, and task orientation each contributed unique variation to reading comprehension in grade 3. The final model shows that these latent variables together accounted for 76% of the variance in grade 3 reading comprehension. This figure is a sum of products achieved by multiplying the concurrent standardized β coefficient by the respective correlation of the latent variable with grade 3 reading comprehension latent variable (see Table 3; for relevant equations, see Schumacker & Lomax, 2010).

Indirect Effects

Modeling also revealed significant indirect relationships between preschool and grade 3 latent factors. Preschool oral language comprehension had a significant indirect effect on grade 3 reading comprehension not only via kindergarten and grade 3 oral language comprehension (specific indirect effect = .29, $t = 3.30$, $p = .001$) but also via kindergarten task orientation (indirect effect = .07, $t = 1.93$, $p = .054$). Preschool reading precursors were associated with grade 3 reading comprehension through kindergarten reading precursors and grade 3 reading fluency (total indirect effect = .22, $t = 2.76$, $p = .006$). Interestingly, preschool task orientation was indirectly related to grade 3 reading comprehension via kindergarten task orientation and grade 3 oral language comprehension (total indirect effect = .11, $t = 2.05$, $p = .041$).

FIGURE 3
The Development of Oral Language Comprehension, Reading Precursors, and Task Orientation in Predicting Reading Comprehension: Model 2



Note. Standardized parameter estimates (factor loadings and regression coefficients) were estimated by *Mplus* (the amount of variance explained in the latent factor is shown in parentheses). All paths displayed as solid lines are significant at $p < .05$ (two-tailed).

TABLE 3
Correlations Between Latent Variables Implied by the Final Model 2

Variable	1	2	3	4	5	6	7	8	9	10
Time 1 (preschool, at age 4)										
1. Reading precursors	—									
2. Oral language comprehension	.54	—								
3. Task orientation	.51	.35	—							
Time 2 (kindergarten, at age 6)										
4. Reading precursors	.86	.47	.44	—						
5. Oral language comprehension	.40	.73	.26	.34	—					
6. Task orientation	.52	.59	.75	.44	.43	—				
Time 3 (grade 3, at age 9)										
7. Reading fluency	−.55	−.30	−.28	−.64	−.22	−.28	—			
8. Oral language comprehension	.45	.71	.43	.39	.85	.63	−.25	—		
9. Task orientation	.47	.46	.31	.49	.48	.40	−.31	.47	—	
10. Reading comprehension	.56	.60	.41	.56	.65	.54	−.60	.74	.58	—

Discussion

In this five-year longitudinal study, our first goal was to examine the concurrent and longitudinal contributions of oral language comprehension, reading precursors, reading fluency, and task orientation to reading comprehension in grade 3. Our second goal was to examine the development of and reciprocal relationship among task orientation, oral language comprehension, reading precursors, and reading fluency.

The results about the developmental interplay between oral language comprehension and task orientation, and the unique roles they had in predicting reading comprehension, add to previous research (Kendeou, van den Broek, et al., 2009; NICHD Early Child Care Research Network, 2005; Paris & Paris, 2003; Storch & Whitehurst, 2002). The findings suggest a reciprocal relationship between oral language comprehension and task orientation across time in the prediction of reading comprehension. Moreover, correlations among the latent factors showed that the link between oral language comprehension and task orientation strengthened substantially from preschool to grade 3. However, task orientation and reading precursors showed a different pattern, which was contrary to our prediction in that task orientation at age 4 did not contribute to later reading precursors.

Our modeling suggests that variation in reading comprehension is captured not only by the two components pertinent to the simple view of reading (Gough & Tunmer, 1986; Hoover & Gough, 1990) but also by task orientation. These findings accord with a number of other studies (Aaron et al., 2008; Cartwright et al., 2016; Georgiou et al., 2013; Guthrie & Klauda, 2014), suggesting that behavioral and affective factors should not be neglected in research on reading comprehension. Importantly, our results show that the pathways to reading comprehension are propelled by behavioral factors relatively early, three years before the onset of formal reading instruction.

Individual differences were conspicuously stable in oral language comprehension from age 4 to age 9 and in reading precursors from age 4 to age 6. Continuity was also observed in task orientation from preschool to grade 3, but lower stability from kindergarten to grade 3 suggests that task-oriented behavior may undergo changes as children adjust to formal schooling. An alternative explanation could be based on measurement error caused by changes among raters and items used.

Our modeling of the links between reading precursors and oral language comprehension supported their developmental independence from preschool to kindergarten. This finding corroborates those by Storch and Whitehurst (2002) and Kendeou, van den Broek, et al. (2009) among English-speaking students. Intervention studies by Bianco et al. (2010) and Bowyer-Crane et al. (2008) have provided even stronger evidence for the developmental independence of decoding-related skills and oral language comprehension.

It is also worth noting that the latent oral language comprehension factor in this study included not only listening comprehension and inference making but also vocabulary knowledge, which has previously been found to be associated either with reading precursors (Kendeou, Papadopoulos, & Kotzapoulou, 2013; Kendeou, Savage, & van den Broek, 2009;) or oral language comprehension (Kendeou, van den Broek, et al., 2009; Protopapas, Simos, Sideridis, & Mouzaki, 2012). Our finding is in line with the latter, as well as with theoretical models of narrative comprehension (Paris & Paris, 2003; van den Broek et al., 2005) and reading comprehension (Perfetti et al., 2005). Those models predict that vocabulary knowledge, memory for the story events, and inference-making skills are foundational components in word-to-text or event-to-story integration (van den Broek et al., 2005; Verhoeven & Perfetti, 2008) and in forming a coherent mental representation of the text. Furthermore, our results are in keeping with those showing that regardless of whether the student was listening to or viewing a pictorial narrative, the same underlying comprehension processes were at work (Kendeou, van den Broek, et al., 2009; Lynch et al., 2008).

Contributions to Reading Research

The present findings add in three ways to the previous research. First, our final model, which included narrative listening comprehension and inference making over the ages of 4–9, as well as text reading fluency and task orientation, accounted for 76% of the variance in grade 3 reading comprehension in the absence of an autoregressor. The models in other longitudinal studies by Dufva et al. (2001) and Kendeou, van den Broek, et al. (2009) predicted 60% and 47% in grade 2, respectively, and the model by Storch and Whitehurst (2002) accounted for 41% of the variance in grades 3 and 4 reading comprehension. Of note also is that a recent cross-sectional study by the Language and Reading Research Consortium (2015) found that word-reading fluency and listening comprehension explained 88% of the variance in grade 3 reading comprehension. The difference in the explained variance between the present study and those with a similar design may relate to differences in how oral language and reading comprehension were measured. Reading comprehension tests differ in the extent that they draw on word decoding, vocabulary knowledge, and other text comprehension

skills (Cutting & Scarborough, 2006) and define comprehension difficulties (Keenan & Meenan, 2014).

Second, the present study traced the development of students' listening comprehension and inference-making skills from age 4 to age 9, that is, until the age when they are reading fluently and text comprehension becomes central to achievement in different subject areas. Because our time span for the assessment of oral language comprehension was longer than in previous studies (Dufva et al., 2001; Florit et al., 2014; NICHD Early Child Care Research Network, 2005; Storch & Whitehurst, 2002), our results provide unique insight into the longitudinal impact of comprehension skills at different points in development. A reliable prediction of grade 3 reading comprehension can be based on listening comprehension and inference-making skills measured as early as the age of 4. Moreover, the results among Finnish-speaking students in grade 3 parallel those showing a decreasing association between reading fluency and text comprehension as a function of age (Language and Reading Research Consortium, 2015; Vellutino, Tunmer, Jaccard, & Chen, 2007).

Previous studies have shown that both reading-related motivation (Schaffner & Schiefele, 2013) and learning-related task orientation (Hirvonen et al., 2010) predict text processing over and above cognitive abilities. The present findings expand prior research by clarifying the unique role of task orientation in the development of oral language comprehension skills that precede reading comprehension (see Lehtinen et al., 1995). We suggest that task motivation facilitates text comprehension in at least two ways. Strong task orientation implies an attempt to approach and master the learning task, simultaneously focusing on the meaning of instruction. In addition, task orientation implies intellectual responsibility and high coherence standards (Perfetti et al., 2005), as well as higher aspiration levels (Järvelä, Salonen, & Lepola, 2002), which in turn results in better reading comprehension (Cain & Oakhill, 1999) and inference making (Clinton, 2015).

Limitations

One limitation of this study relates to the sample we followed from preschool to grade 3. The attrition was not fully random because the participating children showed stronger kindergarten, but not preschool, task orientation than the nonparticipating group.

A second set of limitations involves the measure we used for task orientation. This teacher rating included only three questions at each timepoint, and the questions were not the same for each time period. A further concern regarding this measure may be that the questions were not specific to reading but more generally related to teacher-guided learning tasks. The latter argument can be met in part by the fact that the crafts and playlike situations, which occupy a central role in Finnish preschool and kindergarten, are typically surrounded by teachers' or aides' verbal guidance and instructions. To validate our findings related to task orientation, future research should deploy assessments of task orientation that are more comprehensive and consistent, such as observational methods. In addition, the overlap of grade 3 task orientation and the other concurrent predictors of reading comprehension may be at least partly accounted for by the fact that the teachers, who rated task orientation, also had quantitative and qualitative information about the students' academic performance. However, the significant path found between kindergarten task orientation and grade 3 oral language comprehension cannot easily be explained by this potential bias because of the three-year distance between the timepoints and because listening comprehension and inference making are not assessed in Finnish kindergarten.

A third limitation is that we did not assess vocabulary knowledge at time 3. Hence, conclusions based on our data must accommodate the fact that we used only listening comprehension and inference-making tasks at time 3. In the same vein, we assessed reading comprehension only in grade 3, even though decoding accuracy and reading fluency are acquired relatively early by Finnish-speaking students as compared with students learning to read in less transparent orthographies (Seymour, Aro, & Erskine, 2003).

A fourth limitation is that our emphasis was on narrative text comprehension, even though in grade 3, students are expected to learn from expository texts, such as in science and social studies. Expository texts tend to draw more on the learner's world knowledge than narrative texts do (Best, Floyd, & McNamara, 2008). It should be noted, however, that the students' reading performance on narrative texts used in the present study is shown to be strongly associated with performance on expository text comprehension (r = .72; A. Kajamies, personal communication, February 12, 2015).

Fifth, it can be argued that our measure of inference making (part of our latent oral language comprehension) was not purely oral, as it relied on a picture book rather than orally presented materials.

Finally, we acknowledge that there are other factors, such as working memory and comprehension monitoring, that were not included in our study but are related to language comprehension among prereaders (Hannon & Frias, 2012; Strasser & del Río, 2013) and older students (Cain, Oakhill, & Bryant, 2004). An additional important factor that is absent from the present study is the effectiveness of preschool and kindergarten learning environments in promoting behavioral control

and academic skills (Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009).

Implications for Early Education and Narrative Text Comprehension

In their study of children ages 4–6, Lepola et al. (2012) showed an early and reliable developmental pattern of reciprocal relations involving inference making, listening comprehension, and vocabulary. The main implication was that the assessment of oral language comprehension among prereaders should focus not only on retelling abilities and vocabulary but also on children's inference-making skills. However, Lepola et al. could not answer two obvious questions. First, is the pattern found among prereaders predictive of reading status among students whose reading skills have already stabilized? Second, does early attitude toward scholastic challenges (i.e., task orientation) play a role in this prediction? Both questions were affirmatively answered in the present study.

The results of the current study add to mounting evidence advocating the teaching of comprehension skills even before children can decode (DeBruin-Parecki & Pribesh, 2015). Although many educators and researchers have long acknowledged the importance of a balanced approach to prereading instruction, detailed research on early comprehension skills has lagged behind that on reading precursors, particularly phonological awareness. Further, there have been controversies regarding the importance of language comprehension in early reading development (see Pressley, 2006), with some arguing that its contribution is quite small relative to other skills and could be accounted for by factors such as motivation or interest. Our results, which take into account the interrelations among multiple factors, help shed light on the importance of oral language comprehension. Based on the methods and results of our study, comprehension can be supported, for example, by discussing the explicit and implicit information in stories and identifying narrative elements and protagonists' thoughts, feelings, and actions (see also Paris & Paris, 2007). Further, the continuity of oral language comprehension indicates that tasks involving listening comprehension and inference making enable (preschool) teachers and school psychologists to evaluate and monitor the growth of the child's comprehension skills.

The present findings support the theoretical models of narrative text comprehension and early reading development (Kintsch & van Dijk, 1978; Whitehurst & Lonigan, 1998). Oral language comprehension develops early and contributes not only to reading comprehension but also to task orientation. Theoretically, the tasks we used to assess oral language comprehension and task orientation reflect the growth of students' representational abilities, such as iconic (pictures), symbolic (words), and enactive (adaptation to task), as well as perspective taking (inferences). Those abilities are pervasive in the narrative mode of thinking and in cognitive development (Bruner et al., 1966).

NOTE

The study was supported by a grant (118330) from the Academy of Finland to Janne Lepola. We wish to thank the participating students and the administrators and teachers of the daycare centers and elementary schools where this follow-up study took place.

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Submitted March 3, 2015
Final revision received February 9, 2016
Accepted February 11, 2016

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Supporting Information

Additional supporting information may be found in the online version of this article:

- Appendix A: Examples of 0-, 1-, and 2-Point Answers to the Causal Inference Question and the Characters' Feelings Question
- Appendix B: Elements of the Tuisku Wild Stallion Narrative Text and Examples of Students' Retellings at Time 3