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Relationships between sixth-graders' reading comprehension and two different measures of print exposure

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Abstract This study examined sixth-graders' reading comprehension and component reading abilities in relation to two measures of print exposure: an author recognition test (ART) involving fiction authors and a reading habits questionnaire (RHQ) about children's voluntary reading for enjoyment across various genres. The ART correlated only with children's fiction book reading habits, not with other habits such as nonfiction book or magazine reading, and had a stronger relationship to all tested reading abilities than did the RHQ. Strong comprehenders in reading outperformed weak comprehenders on all component reading measures, ART score, and fiction habits; however, weak comprehenders scored higher than did strong comprehenders on the indicator of nonfiction reading habits. The two groups of comprehenders did not differ significantly on other reported reading habits. The results are discussed in relation to children's specific book choices and demonstrate the relevance of genre to evaluations of children's print exposure.

Keywords Author recognition tests · Print exposure · Reading · Reading comprehension · Reading habits

Not long ago, the Commissioner of Education in our state convened a reading summit attended by reading specialists, general educators, higher education faculty, and others with an interest in children's reading achievement. A central purpose of the summit was to address stagnant scores on the state-mandated reading comprehension assessment. One common viewpoint was captured on local radio by an attendee who

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remarked: "We just need to get them to read more." Fostering voluntary pleasure reading was seen by many as a key way to improve children's reading comprehension.

There are certainly reasons to believe that increasing children's print exposure through activities such as voluntary reading for enjoyment could help improve their reading achievement. Large individual differences in children's print exposure exist based on their experiences both in school (Biemiller, 1977–78; Duke, 2000) and out of school (Anderson, Wilson, & Fielding, 1988; Cunningham & Stanovich, 1991; Stanovich, 1986, 2000). Print exposure appears important to the development of two key components of reading comprehension: reading fluency, or the ability to read text quickly and accurately (Chall, 1996; LaBerge & Samuels, 1974; Stanovich, 1986), and vocabulary, because children are much more likely to encounter unusual vocabulary in the context of reading than everyday conversation (Hayes & Ahrens, 1988). Print exposure that involves wide reading may also increase background knowledge that could facilitate future growth in reading comprehension (Stanovich, 2000). A number of studies have documented relationships between children's print exposure and their vocabulary knowledge (Cunningham & Stanovich, 1991), reading comprehension (Anderson et al. 1988; Cipielewski & Stanovich, 1992; Guthrie, Wigfield, Metsala, & Cox, 1999), and reading fluency (Spear-Swerling, 2006).

Here the term "component abilities" is used to mean reading-related skills or abilities that, though often interrelated, can make independent contributions to reading comprehension performance and growth (e.g., Aaron, Joshi, Gooden, & Bentum, 2008; Gough & Tunmer, 1986). These component abilities include not only vocabulary and fluency, but also word-level reading skills such as word identification. Understanding the influence of print exposure on specific component abilities is important for practical as well as theoretical reasons. For example, in preschoolers, print exposure via parental storybook reading appears primarily to impact children's vocabulary and oral language rather than their emergent word-identification skills (Whitehurst & Lonigan, 2002), suggesting storybook reading interventions as one vehicle for enhancing young children's oral language development.

Print exposure and reading ability likely have a reciprocal causal relationship; early skill in reading may increase the probability that children will have greater print exposure through reading for enjoyment, but reading for enjoyment also may facilitate later growth in reading (Stanovich, 1986). In education, the idea that voluntary pleasure reading improves reading achievement has been enthusiastically embraced (e.g., Krashen, 1993; Smith, 1988). Nevertheless, a number of scientific investigators have expressed cautions about expecting voluntary reading, by itself, to serve as a catalyst for reading improvement. For instance, both Carver and Leibert, (1995) and Snow, Barnes, Chandler, Goodman, and Hemphill, (1991) observed that children sometimes choose easy material for pleasure reading that does not necessarily promote reading growth. The National Reading Panel, (2000) found little evidence that voluntary reading programs improve reading achievement, but also acknowledged the limited research base in this area and the need for more studies. In an experimental intervention study involving a voluntary summer reading program, Kim and White (2008) found that simply providing books to elementary-aged children for voluntary reading was ineffective in improving reading achievement; however, experimental conditions involving adult scaffolding and

guidance (e.g., teacher modeling of comprehension strategies) did promote reading growth.

Previous investigations of children's print exposure have employed several types of measures. In a seminal study of children's voluntary reading habits, Anderson et al. (1988) used activity diaries that required children to log the number of minutes they spent in a variety of out-of-school activities over a period of months. However, activity diaries are time-consuming and can be difficult for children because they require estimating amounts of time (Allen, Cipielewski, & Stanovich, 1992). Two other measures of print exposure that are somewhat easier to use are self-report questionnaires, which ask children about their reading habits, and checklist recognition measures, which involve lists of popular children's authors or children's book titles interspersed with fake items to control for guessing. On the latter measures, children are asked to check off only the author names (or titles) that they are certain are real. The logic of checklist recognition measures is that they serve as a proxy for wide exposure to print, while at the same time avoiding a key problem of questionnaires, the fact that children may tend to skew their responses toward socially desirable answers, for instance, reporting that they read more than they actually do. However, checklist recognition measures do not provide information about children's specific reading habits.

In studies of children's print exposure, one area of interest has involved differences in children's reading habits by genre, for example, their voluntary reading of fiction books as compared to nonfiction books, magazines, comic books, or newspapers (e.g., Hughes-Hassell & Rodge, 2007; Pitcher et al., 2007). These investigations have indicated that older elementary children and adolescents read a wide range of print materials for pleasure and that magazine reading is an especially popular genre. These findings have led some investigators (e.g., Pitcher et al., 2007) to suggest that one way to improve both reading motivation and achievement may be to find ways to incorporate more varied reading materials into classroom instruction. Other researchers (e.g., Strommen & Mates, 2004) have maintained that avid adolescent readers tend to be primarily book readers rather than readers of shorter texts such as magazines.

There is ample evidence (e.g., Anderson et al., 1988; Guthrie et al., 1999; McKenna, Kear, & Ellsworth, 1995; Stanovich, 2000) to suggest large differences in children's overall volume of reading based on reading skill. However, not many studies have examined children's reading habits across genres in relation to their component reading abilities and reading comprehension. A few investigations (Allen et al., 1992; Anderson et al., 1988) have suggested that comic book reading correlates only weakly with book reading and that book reading is a better predictor of achievement than is either comic book or magazine reading. In the present study, we were interested in further exploring children's specific reading habits by genre, including nonfiction as well as fiction book reading, in relation to their component reading abilities and reading comprehension. These habits could vary significantly by genre depending on children's reading abilities. For example, as compared to stronger readers, weaker readers might have a preference for magazines or comic books because they find these shorter texts easier to read. Different genres of text may also impact individual component abilities differentially. For instance, newspapers, popular magazines, and comic books appear to be particularly rich

sources of vocabulary, even relative to children's books (Hayes & Ahrens, 1988). Understanding children's reading habits and preferences in relation to their reading abilities could help to inform both classroom reading instruction and voluntary reading programs aimed at enhancing motivation or achievement.

Furthermore, although evidence indicates that questionnaires and checklist recognition measures correlate substantially with each other (Allen et al., 1992), the relationships between them, and how each measure might relate differentially to component reading abilities as well as to reading comprehension, have not been extensively studied, especially in children. Most checklist recognition measures used with children have emphasized fiction book titles or authors of children's fiction (e.g., Cipielewski & Stanovich, 1992; Cunningham & Stanovich, 1991, 1997). It is uncertain how these recognition measures relate to children's reading habits for genres such as nonfiction books or magazines, an important issue if the measures are intended to serve as proxies for overall print exposure.

The study to be described here used two measures of print exposure based on those found in previous research: a questionnaire about children's voluntary pleasure reading habits and an author recognition test (ART). The questionnaire was adapted in part from a previously used questionnaire (Spear-Swerling, 2006) based largely on the work of Guthrie, Wigfield, and their colleagues (Baker & Wigfield, 1999; Guthrie et al., 1999); the ART was adapted from the work of Stanovich and his colleagues (Allen et al., 1992; Cipielewski & Stanovich, 1992; Cunningham & Stanovich, 1991; Stanovich & West, 1989). In order to try to reduce social desirability effects on the questionnaire, questions were included that required children to name specific items, such as authors, book titles, magazine titles, and newspapers (see Stanovich, 2000). A sixth-grade sample was employed in the study, because individual differences in print exposure and voluntary pleasure reading are well established in children of this age (e.g., Anderson et al., 1988; Pitcher et al., 2007), and because the investigators had a particular interest in adolescent literacy. Children's performance on the two print exposure measures was examined in relation to their component reading abilities (e.g., word identification, vocabulary, fluency, oral comprehension), as measured by standardized tests employed frequently in reading research, and overall reading comprehension. The main questions of the study were as follows: (1) Which voluntary pleasure reading habits would be reported by these sixth graders? (2) Which reading habits, if any, would relate to print exposure as measured by the ART? (3) How would both print exposure measures, the ART and the reading habits questionnaire (RHQ), relate to children's component reading abilities and reading comprehension? (4) Would strong and weak comprehenders in reading differ in specific reading habits by genre or in reported frequency of pleasure reading?

Method

Participants

The participants were 87 sixth-graders (41 male, 46 female, mean age = 11.9 years, *SD* = .4 years) from three schools in three different districts, a suburban school

($n = 44$), an urban school ($n = 21$), and an interdistrict magnet school ($n = 22$). Invitations to participate in the study were sent to parents of all sixth-graders at these schools. All three schools were comparable in size, with a total population at each school of approximately 600 students. Racial and ethnic background of students at each school at the time of the study was as follows: At the suburban school, the population was approximately 1% Asian, 2% Hispanic, less than 1% African-American, and 97% white, non-Hispanic; at the urban school, 5% Asian, 23% Hispanic, 24% African-American, and 47% white, non-Hispanic; and at the magnet school, 6% Asian, 10% Hispanic, 42% African-American, and 41% white, non-Hispanic. At the suburban school, only 8% of children were eligible for free or reduced-price lunch, whereas this percentage was 44% for the urban school and 23% for the magnet school. Thus, most children at the suburban school were white, non-Hispanic, and from middle-socioeconomic backgrounds, whereas those at the other two schools were more diverse ethnically, racially, and socioeconomically. All of the children were fluent English speakers and none received special-education services at the time of the study.

Materials and procedure

The children were tested individually in the latter half of sixth grade on the following tests: from the Woodcock-Johnson III Tests of Achievement (WJ-III, Woodcock, McGrew, & Mather, 2001), Word Identification, Word Attack, Oral Comprehension, Reading Fluency, and Passage Comprehension; the Peabody Picture Vocabulary Test-III (PPVT-III, Dunn & Dunn, 1997); the ART; and the RHQ about children's voluntary reading for pleasure. Order of test administration was counterbalanced across participants. In March of sixth grade, children took the Connecticut Mastery Test (CMT, Connecticut State Department of Education, 2006), a statewide assessment given to all public school children in Connecticut.

Woodcock-Johnson-III subtests

The Word Identification (WI) subtest of the WJ-III involves reading a series of real words such as *house* presented out of context. Word Attack (WA) involves reading pseudowords such as *tat*. Passage Comprehension (PC) uses a cloze format; the child reads a series of sentences or passages and provides a contextually appropriate word to fit in a blank. The format of Oral Comprehension (OC) is similar to that of PC, except that it involves listening to a separate set of sentences or passages read aloud by the examiner. Reading Fluency (RF) requires reading a series of sentences under timed conditions and specifying "yes" or "no" after each sentence (e.g., "The day after Tuesday is Wednesday" should be marked "yes"). The split-half, Spearman-Brown reliabilities (McGrew & Woodcock, 2001) for the first four subtests for 12-year-old are as follows: .90 (WI), .85 (WA), .80 (PC), and .66 (OC); the reliability of RF, a speeded test, was calculated using Rasch analysis procedures and is .90 for the study age group.

Peabody Picture Vocabulary Test-III (PPVT-III)

The PPVT-III, a measure of receptive vocabulary, involves listening to the examiner read a word, then pointing to an appropriate picture to go with the word out of a series of four options. The internal reliability for this test is .96 (Dunn & Dunn, 1997).

Measures of print exposure

Directions for both measures of print exposure, the ART and the RHQ, were read aloud by the examiner. The ART involved a list of children's authors mixed with names that were not children's authors (foils). There were 34 real authors (17 male, 17 female) representing authors of popular fiction for children and teens (e.g., Brian Jacques, Louis Sachar, Meg Cabot, Madeleine L'Engle), selected via a web search of best-selling authors of child and teen fiction on sites such as Amazon, Barnes & Noble, and Borders. Foils were 24 names (12 male, 12 female) from the editorial board of the journal *Scientific Studies of Reading*. The general test format and administration procedures were adapted from the work of Stanovich and his colleagues (Allen et al., 1992; Cunningham & Stanovich, 1991). Children were instructed to check off all names that they were certain were actual children's authors; they were cautioned not to guess because guessing could be detected by the foils. Analyses used a derived score calculated from the number of real authors correctly checked off minus the number of false alarms to foils. Cronbach's alpha for the number of real authors detected by children was .76. A copy of the ART can be found in the Appendix.

The RHQ involved a set of 12 questions (see Table 2). Directions for the RHQ emphasized that the questions involved only reading for enjoyment and that reading done for school work or homework should not be counted. The initial items on the RHQ were adapted primarily from the work of Baker and Wigfield, (1999) and Guthrie et al. (1999). The first three questions asked children whether they had read any fiction books, nonfiction books, or magazines/comics for fun in the past week; each question was coded with a 1 for *yes* and a 0 for *no*. If children responded *yes* to any of the first three questions, they were asked to specify the names of all books, magazines, and comic books they had read (question four). Children had to give at least an approximately correct title in order to receive credit. Of children who said they had read a fiction book in the past week, 83% did name an actual fiction book title in response to question four; 86% of children who said they had read a nonfiction book supplied an actual nonfiction title; and 86% of those who claimed to have read a magazine or comic book supplied a correct title of a magazine or comic book. Many of these titles were not familiar to the investigators and had to be verified via a web search. However, it was rare for a child to name a book, magazine, or comic book that could not be verified as real, with these nonverifiable titles less than 1% of titles named. For some books, especially nonfiction, children named titles that could be associated with more than one possible book (e.g., *The Biography of Abraham Lincoln, Frogs, Cars*); these responses were accepted as correct. Children's responses were coded in terms of number of titles named within each of the following genres: fiction books, nonfiction books, magazines, or comic books.

The fifth and sixth questions on the RHQ asked children how often they read a book, magazine, or newspaper for fun; the seventh asked how often they went to a bookstore or library just for enjoyment. Each of these questions was coded 0 for *almost never*, 1 for *about once a month*, 2 for *about once a week*, and 3 for *almost every day*. The eighth and ninth questions asked children to specify the names of newspapers or comic books that they read regularly; these were coded according to number of verifiable titles named in each category. The last three questions, which were adapted from the work of Stanovich and West (1989), asked children to name their favorite books, magazines, and authors. Again, to receive credit, a child had to name a specific book, magazine, or author that appeared to be genuine, with all unknown responses verified via web search. The examiner encouraged children to name as many "favorites" as they wished. Responses to question 10, the favorite books question, were coded in terms of number of titles mentioned within each of the following two categories: fiction or nonfiction. Children's favorite authors were almost universally those of fiction; only one child named a nonfiction author as a favorite, Rosa Parks. Cronbach's alpha for the total 12-item score on the self-report measure was .62.

Connecticut Mastery Test (CMT)

On this state-mandated assessment, the child's reading score is a scaled score that represents a composite of performance across two reading subtests: the Degrees of Reading Power (DRP, Questar Assessment, 2006) and a second measure that involves reading passages and answering questions about them (Connecticut State Department of Education, 2006). The DRP uses a maze format and informational passages; the second reading measure uses passages from a variety of genres, with both multiple-choice and open-ended questions. Scores from the DRP can also be translated into grade equivalents. Both reading subtests are group-administered over several sessions, and although there are time limits for the subtests, most children finish the test within the allotted time limits. Cronbach's alpha for the total scaled score in reading was .95 for the test given at the time of the study.

Results

Descriptive statistics

Reading abilities

Sample means and standard deviations for all of the reading measures, by school and for the total sample, are listed in Table 1. Descriptive statistics for the entire sample of sixth graders indicated that, on the Woodcock-Johnson-III subtests and PPVT, most children were functioning within the average (90–110) or high average (111–120) range, but also that there were some children at the extremes of achievement. Similarly, on the state-mandated reading assessment, the CMT, most children were functioning within the state's goal range, but again there were children at the extremes of achievement. As displayed in Table 1, on most of the

Table 1 Reading abilities by school and for the total sample

Reading ability	Suburban school sample ($n = 44$) Mean (SD)	Urban school sample ($n = 21$) Mean (SD)	Magnet school sample ($n = 22$) Mean (SD)	Total sample ($N = 87$) Mean (SD)
WJ-III word identification	109.2 (7.1)	104.9 (11.5)	106.7 (15.0)	107.5 (10.7)
WJ-III word attack	103.8 (7.2)	98.3 (10.6)	104.9 (12.4)	102.8 (9.6)
WJ-III reading fluency	113.8 (11.3)	102.4 (14.8)	105.3 (17.3)	108.9 (14.0)
WJ-III oral comprehension	107.5 (9.0)	101.8 (14.5)	105.5 (9.4)	105.6 (10.7)
Peabody picture vocabulary (PPVT)	108.8 (8.4)	106.1 (13.0)	103.6 (13.3)	106.9 (11.1)
WJ-III passage comprehension	102.2 (6.9)	96.8 (12.5)	96.3 (9.0)	99.4 (9.2)
Connecticut mastery test (CMT)—reading	269.6 (27.7)	259.2 (41.1)	239.2 (41.0)	259.3 (36.7)

Note: Scores for Woodcock–Johnson tests and PPVT are age-based standard scores with a test mean of 100 and a standard deviation of 15; those for the CMT are scaled scores, with the goal range for sixth graders set at 236–288

reading ability measures, the sample from the suburban school obtained higher mean scores and also demonstrated less variability in scores than did the samples from the other two schools.

A multivariate ANOVA on these data, with the reading measures as dependent variables and school as a fixed factor, yielded significant overall multivariate effects, Wilks' Lambda = .627, $F(18, 148) = 2.162$, $p < .01$, partial $\eta^2 = .208$. However, tests of between-subjects effects were significant only for CMT Reading total scaled score, $F(2, 82) = 5.531$, $p < .01$, partial $\eta^2 = .119$. Post hoc Bonferroni tests showed significant differences in CMT score only for the suburban school sample versus the magnet school sample ($p < .01$).

A second multivariate ANOVA, with the reading measures as dependent variables and gender as the fixed factor, showed marginally significant overall multivariate effects, Wilks' Lambda = .858, $F(6, 79) = 2.171$, $p = .055$, partial $\eta^2 = .142$, but no significant between-subjects effects based on gender for any of the reading ability measures.

Author recognition test

Children's mean derived score on this test was 6.2 ($SD = 4.1$) for the sample as a whole, with a range from −3 to 16. Children could obtain a negative score on the test if they checked more foils than real authors. Overall, however, the number of false alarms to foils was low, with an average of 1.3 foils checked per child.

Reading habits questionnaire

Responses to the RHQ are shown for the total sample in Table 2, which addresses the first question of the study, children's reported pleasure reading habits. An examination

of results for the first four items shows that the most popular type of pleasure reading material for these sixth graders involved magazines, followed by fiction books, nonfiction books, and comic books. About 70% of the sample named one or more magazines they had read in the past week, as compared with 45% of the sample naming fiction books they had read in the past week, 29% naming nonfiction books, and 9% naming comic books. When asked about frequency of reading, 28% of the sample said they read books or magazines for enjoyment rarely (once a month or less), but 33% claimed to read books or magazines for pleasure almost every day. Children reported reading newspapers less frequently than books or magazines, but about 18% of the sample reported reading a newspaper for enjoyment almost every day. With regard to the last three items on the RHQ, children overwhelmingly favored fiction for their favorite books, with 83% of children naming at least one fiction book as a favorite and only 14% naming any nonfiction books as favorites. About 72% of children had at least one favorite magazine, and 68% had at least one favorite author.

Composite scores for reading habits

Examination of the Spearman's rho intercorrelations among the individual RHQ items revealed that items involving the same genre of reading correlated substantially with each other. To facilitate further analyses, composite scores for reading habits involving different genres of reading were formed. First, however, responses to question three ("Have you read for fun any magazines or comic books outside of school in the past week?"), which combined the genres of magazines and comic books in a single question, were recoded into two new variables, one for magazines and one for comic books. This recoding was based on children's responses both to question three and question four, which asked children to name the titles of everything they had read in the past week. Children who responded *yes* to question three, who also named at least one magazine in response to question four, received a "1" for the recoded magazine variable; similarly, children who responded *yes* to question three, who named at least one comic book in response to question four, received a "1" for the recoded comics variable. Children who responded *no* to question three, or who responded *yes* but were then unable to name any magazines or comic books in response to question four, received recoded scores of "0" for both of the new variables. Thus, for the recoded variables, children could receive two scores of "1," two scores of "0," a "1" and a "0," or a "0" and a "1." Only these recoded variables were employed in the composite scores, not children's original responses to question three.

Next, five composite scores were calculated for the following five genres of reading: fiction books, nonfiction books, magazines, comic books, and newspapers. The composites were all average *z*-scores across two to four different items in the questionnaire. The fiction habits composite was based on the following four items: response to question one ("Have you read for fun any fiction books outside of school in the past week?"), number of verifiable fiction book titles named in response to question four ("Name the titles of all the books, magazines, and/or comic books you have read in the past week"), number of verifiable fiction book titles named as favorite books in response to question 10, and number of verifiable

Table 2 Responses to the RHQ for the total sample ($N = 87$)

Question	Responses and percentages of total sample
1. Have you read for fun any fiction books outside of school in the past week?	Yes—54% No—46%
2. Have you read for fun any nonfiction books outside of school in the past week?	Yes—33% No—67%
3. Have you read for fun any magazines or comic books outside of school in the past week?	Yes—87% No—13%
4. Name the titles of all the books, magazines, and/or comic books you have read in the past week?[a]	No titles named—8% One or more fiction books named—45% One or more nonfiction books named—29% One or more magazines named—70% One or more comic books named—9%
5. About how often do you read a book or magazine outside of school, for fun?	Almost never—5% About once a month—23% About once a week—39% Almost every day—33%
6. About how often do you read for fun something in a newspaper (e.g., sports page, news stories, advice columns), outside of school?	Almost never—22% About once a month—16% About once a week—44% Almost every day—18%
7. About how often do you go to a bookstore or the library just for enjoyment, not because of school assignments or homework?	Almost never—22% About once a month—55% About once a week—18% Almost every day—5%
8. Name any newspapers that you read regularly?	No newspapers named—37% One newspaper named—54% Two newspapers named—9%
9. Name any comic books that you read regularly?	No comic books named—74% One comic book named—18% Two or three comic books named—8%
10. Out of all the books you have read yourself, which are your favorites? Name the titles of your favorite books?[a]	No titles named—9% One fiction book named—24% Two to three fiction books named—48% Four to seven fiction books named—11% One nonfiction book named—13% Two nonfiction books named—1%

Table 2 continued

Question	Responses and percentages of total sample
11. Do you have any magazines that you read regularly? Name the titles of your favorite magazines?[b]	No titles named—29% One magazine named—30% Two magazines named—36% Three or four magazines named—6%
12. Do you have any favorite authors whose books you look forward to reading? Name your favorite authors?[b]	No authors named—31% One author named—34% Two or three authors named—34%

[a] Percentages for these cells do not sum to 100% because children could name titles from more than one genre

[b] Percentages do not sum to 100% due to rounding

fiction authors named as favorites in response to question 12. Cronbach's alpha for the fiction habits composite was .67. The nonfiction habits composite was based on three items: response to question two ("Have you read for fun any nonfiction books outside of school in the past week?"), number of verifiable nonfiction titles named in response to question four, and number of verifiable nonfiction titles named as favorites in response to question 10. Cronbach's alpha for this composite was .70. Number of nonfiction favorite authors was not included in the nonfiction composite because only one child in the entire sample named a nonfiction author as a favorite, and inclusion of this variable reduced Cronbach's alpha to an unacceptable level.

The magazine habits composite was based on the following three items: the recoded magazine variable described previously, the number of verifiable magazine titles the child said he or she had read in the past week (question four), and the number of verifiable favorite magazines named in response to question 11; Cronbach's alpha for this composite score was .81. The comic book habits composite was also based on three items: the recoded comics variable, the number of verifiable comic book titles named in response to question four, and the number of verifiable comic books named in response to question nine ("Name any comic books that you read regularly"); Cronbach's alpha for the comic book habits score was .82. Finally, the newspaper habits composite was based on two items, the child's response to question six ("About how often do you read for fun something in a newspaper?"), and the number of verifiable newspaper titles the child named in response to question eight ("Name any newspapers that you read regularly"); Cronbach's alpha for this composite was .67.

Reading habits by school and by gender

Differences between schools

Kruskal–Wallis tests showed some significant differences in reading habits by school with regard to newspaper habits (chi-square = 15.307, $p < .001$) and comic

book reading habits (chi-square = 7.735, $p < .05$). In both cases, results indicated that the children from the magnet school scored highest and those from the suburban school lowest on these composite scores. There were no significant differences between schools in other reading habits, such as fiction book reading or magazine reading, or in ART score. The high scores of the children from the magnet school on the newspaper and comic book habits composites may reflect an emphasis at that school on making comic books as well as more conventional reading materials available in the school library, and on recommending to parents that they encourage regular newspaper reading at home.

Differences between genders

There were some clear gender differences in children's reading habits. Mann–Whitney *U* tests showed that boys scored higher than girls on the nonfiction habits composite score ($Z = -3.176$, $p < .01$) and on the comic book habits composite ($Z = -2.382$, $p < .05$). However, girls scored higher than boys on the magazine habits composite ($Z = -2.626$, $p < .01$). There was very little overlap in magazines read by boys and girls; for example, although *Sports Illustrated* and *Sports Illustrated for Kids* were popular magazine choices for boys, only one girl in the entire sample mentioned reading these magazines for pleasure. Although there were no significant differences by gender on the fiction habits composite, with regard to specific titles named, boys tended to favor adventure stories, spy novels, horror, and science fiction, whereas girls favored fiction with social themes (e.g., *Sisterhood of the Traveling Pants* by Ann Brashares). However, in contrast to magazines, there was considerable overlap in boys' and girls' choices of books; for instance, both genders were big fans of the *Harry Potter* series by J.K. Rowling and the *Unfortunate Events* series by Lemony Snicket. Furthermore, there were no significant gender differences in reported frequency of book or magazine reading for pleasure (question five on the RHQ) or in ART score.

Reading habits and ART performance

To address the second question of the study, the relationship between ART performance and children's reported reading habits across various genres of reading, Spearman's rho correlations between the reading habits composite scores and the ART were examined. Only one of these correlations was significant: the one between the fiction book habits composite and the ART ($r = .41$, $p < .001$). No other correlation approached significance. An examination of the Spearman's rho correlations for individual items on the RHQ confirmed that the positive relationships between this test and the ART involved only fiction book reading, not other genres of reading.

Relationships between print exposure and reading abilities

The third question of the study involved relationships between the two print exposure measures, the ART and the RHQ, and children's reading abilities. Table 3

Table 3 Spearman's Rho correlations of reading abilities with ART score, reading habits, and reported frequency of reading

Reading ability	ART	Reading habits/ fiction books	Reading habits/ nonfiction books	Reading habits/ magazines	Reading habits/ newspapers	Reading habits/ comics	Frequency of reading books/mags (single item)
WJ-III word identification	.69***	.23*	−.17	.08	.13	.08	.11
WJ-III word attack	.56***	.10	−.07	.01	.20	.11	.07
WJ-III reading fluency	.45***	.14	−.19	.20	.17	.02	.05
WJ-III oral comprehension	.57***	.35**	−.16	.11	.30**	.18	.25*
Peabody picture vocabulary	.57***	.25*	−.03	.09	.22*	.12	.19
Reading comprehension	.60***	.28**	−.22*	.09	.07	−.02	.13

* $p < .05$, ** $p < .01$, *** $p < .001$

shows the Spearman's rho correlations of the ART and the various composite scores from the RHQ with the reading measures of the study, as well as with children's reported frequency of reading books and magazines. Frequency of reading was measured by a single item, question five on the RHQ ("About how often do you read a book or magazine outside of school, for fun?"). The Reading Comprehension variable shown in the bottom row of Table 3 is an average of children's *z*-scores for WJ-III Passage Comprehension and their CMT Reading scaled scores; all component reading measures correlated significantly ($p < .001$) and at least moderately (all Spearman's rho r values >.48) with Reading Comprehension.

The ART correlated substantially with every reading measure, with correlations ranging from a low of .45 ($p < .001$) for Reading Fluency to a high of .69 for Word Identification ($p < .001$). As compared to the ART, the composite scores from the RHQ related less consistently and more weakly to children's reading abilities. The most consistent relationships between reading abilities and the RHQ composite scores involved fiction reading habits, which correlated most highly with Oral Comprehension ($r = .35$, $p < .01$) and Reading Comprehension ($r = .28$, $p < .01$), and more weakly, but still significantly, with Word Identification ($r = .23$, $p < .05$) and PPVT score ($r = .25$, $p < .05$). Newspaper reading habits correlated significantly only with Oral Comprehension ($r = .30$, $p < .01$) and PPVT score ($r = .22$, $p < .05$). Magazine reading habits and comic book habits did not correlate significantly with any reading measure. And surprisingly, there was one inverse relationship: Nonfiction reading habits correlated *negatively* with Reading Comprehension ($r = -.22$, $p < .05$). Reported frequency of pleasure reading did not correlate significantly with any reading ability except for Oral Comprehension ($r = .25$, $p < .05$).

Finally, it should be noted that reported frequency of reading books or magazines, as measured by question five on the RHQ, related significantly to only

one reading habits composite score: fiction reading habits (Spearman's rho $r = .49$, $p < .001$). Reported frequency of reading books or magazines also correlated significantly with ART score (Spearman's rho $r = .23$, $p < .05$). Thus, children who said they read frequently for pleasure appeared to be primarily readers of fiction books rather than of other genres such as nonfiction books or magazines.

Reading habits of strong and weak comprehenders in reading

To address the final question of the study, the frequency of pleasure reading and specific reading habits of strong and weak comprehenders, children with the highest average *z*-scores for Reading Comprehension ($n = 31$, 14 male, 17 female) in the sample were compared to those with the lowest average *z*-scores ($n = 30$, 16 male, 14 female). Reading Comprehension *z*-scores in the middle ($n = 26$) were eliminated from these particular analyses. The 31 children with the highest *z*-scores, the strong comprehenders, had a mean Passage Comprehension score of 110 (75th percentile) and a mean CMT score between levels 4 and 5 (goal to advanced). The 30 children with the lowest *z*-scores, the weak comprehenders, had a mean Passage Comprehension score of 90 (25th percentile) and a mean CMT score at level 3 (one level below the state goal). A crosstabs analysis showed that 65% of the strong comprehenders came from the suburban school, with 19% from the urban school and 16% from the magnet school; conversely, of the weak comprehenders, 40% came from the magnet school, 30% from the urban school, and 30% from the suburban school. Thus, although the strong comprehenders came disproportionately from the suburban school, all three schools were represented in both groups of comprehenders.

A multivariate ANOVA, with the reading measures and the ART as dependent variables and reading comprehension group as a fixed factor, yielded significant overall multivariate effects, Wilks' Lambda = .372, $F(6, 53) = 14.902$, $p < .001$, partial $\eta^2 = .628$, with tests of between-subjects effects significant for all component reading measures ($p < .001$ for all measures), and with the largest effect sizes for the PPVT and Word Identification, partial $\eta^2 = .506$ and .459 respectively, and the smallest effect size for Word Attack, partial $\eta^2 = .190$. Between-subjects effects also were significant for the ART, $p < .001$, partial $\eta^2 = .350$. However, although the two groups of comprehenders differed significantly on all component reading measures and on the ART, Mann–Whitney *U* tests found few quantitative differences between groups on the composite scores from the RHQ. Strong comprehenders had higher scores than weak comprehenders on the fiction reading habits variable ($Z = -1.986$, $p < .05$), but weak comprehenders had higher scores than strong comprehenders on the nonfiction habits composite ($Z = -2.051$, $p < .05$). There were no significant differences between strong and weak comprehenders on any other composite scores for reading habits or on reported frequency of pleasure reading of books or magazines (question five on the RHQ).

Finally, specific titles named by strong and weak comprehenders were examined. These analyses focused on fiction and nonfiction book titles, because reading habits for these genres were the only ones on which strong and weak comprehenders differed significantly, using children's responses to question four on the RHQ, that is, books children said they had read during the past week.

Specific fiction books named by strong versus weak comprehenders

Table 4 displays the fiction titles named by strong and weak comprehenders. As illustrated by the table, strong comprehenders named nearly twice as many fiction titles as did weak comprehenders. In addition, for each book, length in pages and reading grade level were determined. Length was calculated based on web information provided for the paperback versions of all titles, unless only a hardcover version was available. The reading grade level for each book was calculated using information provided through Scholastic's Teacher Book Wizard web site (www2.scholastic.com/browse/read.jsp) or the Flesch–Kincaid formula under text statistics on Amazon.com. Often both web sites provided reading grade level

Table 4 Fiction books named by sixth graders as voluntary pleasure reading material

Strong comprehenders Mean grade level of functioning = 9.7 (n = 31)	Weak comprehenders Mean grade level of functioning = 5.8 (n = 30)
Inventing Elliot (Graham Gardner)	My Teacher is an Alien (Bruce Coville)
The Search for Belle Prater (Ruth White)	The Haunted School (R.L. Stine)
Eragon (Christopher Paolini)	The Magic Box (Barbara Benner)
The Eldest (Christopher Paolini)	The House of the Scorpion (Nancy Farmer)
Second Summer of the Sisterhood (Ann Brashares)	The Princess Diaries (Meg Cabot)
Little Secrets (Emily Blake)	Niagara Falls, or Does it? (Henry Winkler)
Ghost Ship (Dietlof Reiche)	How to Eat Fried Worms (Thomas Rockwell)
The War with Grandpa (Robert K. Smith)	The Secret Language of Girls (Frances Dowell)
Mosh Pit (Kristyn Dunnion)	Junie B. Jones and her Big Fat Mouth (Barbara Park)
Summer Boys (Hailey Abbott)	Holiday in the Sun (Mary-Kate and Ashley Olsen)
Artemis Fowl (Eoin Colfer)	The Bad Beginning (Lemony Snicket)—2 children
Inkheart (Cornelia Funke)	Harry Potter and the Sorcerer's Stone (JK Rowling)—2 children
Dragon Rider (Cornelia Funke)	
The Twits (Roald Dahl)	
Travel Team (Mike Lupica)	
Stargirl (Jerry Spinelli)	
Natalie's Secret (Melissa Morgan)	
Click Here (Denise Vega)	
The Hardy Boys/The Tower Treasure (Franklin Dixon)	
Things Not Seen (Andrew Clements)	
The Vile Village (Lemony Snicket)	
Harry Potter and the Order of the Phoenix (JK Rowling)	
Harry Potter and the Goblet of Fire (JK Rowling) – 2 children	
Mean book length = 371.6 pp (SD = 237.0)	*Mean book length = 205.1 pp (SD = 123.7)*
Mean grade level = 5.5 (SD = .9)	*Mean grade level = 4.7 (SD = 1.2)*

information on a given book, and where this was the case, an average grade level across both sites was used. Reading grade level information was located for all but one fiction title.

Fiction titles named by strong comprehenders had a mean length of 371.6 pages ($SD = 237.0$ pages) and a mean grade level of 5.5 ($SD = .9$); those named by weak comprehenders had a mean length of 205.1 pages ($SD = 123.7$ pages) and a mean grade level of 4.7 ($SD = 1.2$). A one-way ANOVA indicated that differences for both book length and grade level were statistically significant; for length, $F(1, 36) = 5.920$, $p < .05$, and for grade level, $F(1, 35) = 4.497$, $p < .05$. That is, as one would expect, strong comprehenders were reading longer, more difficult texts for voluntary reading, on average, than were weak comprehenders.

To determine whether children generally were picking relatively easy or difficult books, an estimate of each group's mean grade level of overall functioning in reading was sought. This estimate considered grade equivalent scores from the three measures in the study that tapped reading comprehension and that also yielded grade equivalents: WJ-III Passage Comprehension, WJ-III Reading Fluency, and the Degrees of Reading Power from the CMT. Mean grade equivalents for each group on these tests varied greatly, by 2–3 grade levels, with PC consistently lowest, the DRP consistently highest, and RF the median score for both groups. As the median score, RF was selected to estimate overall functioning in reading; for strong comprehenders, the mean RF grade equivalent was 9.7, and for weak comprehenders, it was 5.8. Thus, comparing children's book choices to their levels of functioning, both groups of comprehenders selected relatively easy fiction for pleasure reading, but these differences were most pronounced for the strong comprehenders, who picked books approximately 4 years below their current functioning (9.7 vs. 5.5); weak comprehenders picked books about 1 year below their current functioning (5.8 vs. 4.7). The use of a mean rather than median grade equivalent score to estimate current level of functioning in reading did not alter this overall pattern of results.

Specific nonfiction books named by strong versus weak comprehenders

The nonfiction titles named by children as books they had read in the past week are displayed in Table 5, which shows that weak comprehenders named twice as many nonfiction titles as did strong comprehenders. It was not possible to determine book length and grade level for these books, because as indicated in the table, for the nonfiction books a given title often was associated with more than one possible book. Also, length information for the nonfiction books would in some cases have been misleading. For example, one child named a cookbook which was over two hundred pages long, but it is unlikely that the child would have read the entire cookbook cover to cover, as a fiction book generally would be read.

Nevertheless, a perusal of the titles in Table 5 reveals some interesting patterns. Both strong and weak comprehenders named biographies (e.g., a biography of Jimmy Carter, a biography of Abraham Lincoln) and books on specific topics (e.g., *Dogs*, *Cars*); however, strong comprehenders named biographies more often, and weak comprehenders named books on specific topics more often. Furthermore, only weak

Table 5 Nonfiction books named by sixth graders as voluntary pleasure reading material

Strong comprehenders Mean grade level of functioning = 9.7 (n = 31)	Weak comprehenders Mean grade level of functioning = 5.8 (n = 30)
Marley and Me (John Grogan)	Chicken Soup for the Teenage Soul (Jack Canfield)
Dogs (multiple books/authors)	Rescue: A Police Story (Alison Hart)
Jimmy Carter—biography (multiple books/authors)	Guinness 2007 World Records Book (Guinness World Records)
Derek Jeter—biography (multiple books/authors)	One Shot, One Kill (Charles Sasser and Craig Roberts)
Joe Montana—biography (multiple books/authors)	The New Junior Cookbook (Better homes & gardens test kitchen)
Eleanor Roosevelt—biography (multiple books/authors)	Magic Eye (Magic Eye Inc.)
	World War II (multiple books/authors)
	Frogs (multiple books/authors)
	Cars (multiple books/authors)
	Amazing Facts (multiple books/authors)
	Abe Lincoln—biography (multiple books/authors)
	Ben Roethlisberger—biography (multiple books/authors)

Note: "Multiple books/authors" means that the title the child named could be matched with more than one book and author; due to the number of such nonfiction titles, mean book length and grade level could not be computed for these books

comprehenders named cookbooks (*The New Junior Cookbook*), books involving short vignettes (*Chicken Soup for the Teenage Soul*), books involving lists of facts or world records (*Amazing Facts, Guinness Book of World Records*), or books with images rather than text as primary features (*Magic Eye*). Children's reasons for making these particular nonfiction choices cannot, of course, be determined with certainty. However, it seems likely that weak comprehenders found their nonfiction choices easier to read or understand than other options for voluntary reading. To sum up, both groups of comprehenders read fiction and nonfiction books; however, strong comprehenders appeared much more oriented toward fiction than nonfiction books for voluntary reading, whereas in comparison to strong comprehenders, weak comprehenders were relatively more oriented toward nonfiction books.

Discussion

Answers to the study questions

Overall, the results of the RHQ were consistent with other data (Hughes-Hassell & Rodge, 2007; National Education Association, 2001; Pitcher et al., 2007) showing that children in this age group report reading a wide variety of text types for enjoyment. Similar to the findings of Hughes-Hassell and Rodge, (2007), magazines were an especially popular genre for the sample as a whole. However, children who reported reading frequently for pleasure were primarily readers of fiction books, a

finding in line with other studies suggesting that avid adolescent readers tend to be book readers (e.g., Strommen & Mates, 2004), as well as with poll data indicating that adolescents generally prefer fiction over nonfiction books (National Education Association, 2001). Although the present study found many qualitative differences between boys and girls in reading habits, such as in choices of specific books and magazines, there were no gender differences in ART score, reported frequency of reading, or reading abilities. This finding is somewhat at odds with other data (McKenna et al., 1995; National Education Association, 2001), including an extremely large, multinational study (Chiu & McBride-Chang, 2006) on gender differences in reading, indicating that girls are more likely to enjoy reading for pleasure than boys. This disparity in findings may reflect the small size of our sample or some aspect of our study methodology. For instance, unlike some other investigations, the current study did not ask children directly about their reading attitudes, such as whether they enjoy or value reading, but rather about their frequency of reading across a variety of genres.

The two measures of print exposure, the ART and the RHQ, did correlate significantly. However, only the fiction reading habits composite from the RHQ, not composites for other genres such as nonfiction books or magazines, related to performance on the ART. This result suggests the importance of considering genre in investigations using checklist recognition measures of children's print exposure. The current study indicates that, at least in children of this age group, checklist recognition measures involving fiction are not necessarily a proxy for a child's reading of other genres such as magazines or nonfiction.

Although both print exposure measures correlated with reading abilities, the ART had a much stronger relationship with component reading abilities and reading comprehension than did the reading habits composite scores, even the composite involving fiction reading habits. The stronger relationship of the ART to children's reading abilities may be due in part to the fact that, as Stanovich and his colleagues have suggested (Allen et al., 1992; Cunningham & Stanovich, 1991), checklist recognition measures are less susceptible to social desirability effects than are questionnaires. The RHQ also focused specifically on voluntary pleasure reading outside of school, whereas the ART used in the present study may have been a proxy for both in-school and out-of-school print exposure. Although the ART correlated robustly with all component reading abilities, the strongest relationship was with Word Identification. Other findings (Cunningham & Stanovich, 1997) have demonstrated that early success in acquiring basic word reading skills contributes to higher levels of print exposure in adolescence.

Groups differentiated by reading comprehension level differed significantly in their ART scores, fiction book reading habits, and nonfiction book reading habits. However, although strong comprehenders outperformed weak comprehenders on the print exposure measures involving fiction (the ART and fiction habits composite), the opposite pattern emerged for the nonfiction habits composite: Weak comprehenders scored higher than strong comprehenders. An examination of the specific nonfiction titles named by children suggested that many weak comprehenders' orientation toward nonfiction related to the selection of certain kinds of nonfiction books, such as those involving separate vignettes, lists of facts,

recipes, or specific topics. Other studies (e.g., Cain, Oakhill, & Bryant, 2004; Nation, 2005) have shown that weak comprehenders often have difficulties with working memory and with discourse-level comprehension skills such as text integration, inferencing, and comprehension monitoring. The kinds of nonfiction selected by many weak comprehenders in the present study may make fewer demands on these kinds of comprehension skills than fiction book reading, which often requires following a complex plot and the interactions of multiple characters throughout hundreds of pages of text. Furthermore, when matched to a child's interests and knowledge (as would be likely when a child selects a book for voluntary reading), nonfiction books on specific topics such as cars or World War II may be easier to understand than fiction books. For instance, a weak comprehender with a specific interest in or knowledge base about cars may be able to sustain comprehension better in a book about cars, because of a greater level of engagement on the child's part or because of a knowledge base that facilitates compensation for weaknesses in certain comprehension processes.

The two groups of comprehenders did not differ significantly in habits involving other genres of reading such as magazines, newspapers, or comic books. Although we originally expected that weak comprehenders might have a preference for these shorter types of texts, any comprehension advantage conferred by the relative brevity of texts such as magazines may be offset by other factors, such as their comparatively heavy demands on vocabulary (Hayes & Ahrens, 1988). In addition, weak comprehenders were as likely as strong comprehenders to say they read frequently for pleasure, perhaps reflecting the fact that most children in the sample read well enough to find texts they could read for enjoyment if they were inclined to do so. Once children have attained some threshold level of reading skill, other variables besides reading ability may become important in determining how much children choose to read for pleasure, as some investigators (e.g., Strommen & Mates, 2004) have argued.

Despite the lack of difference in reported *frequency* of pleasure reading between strong and weak comprehenders, the present results are consistent with other studies indicating large differences in reading *volume* based on reading skill. For example, the results for the ART were similar to those of other studies (Stanovich, 2000) which have employed checklist recognition measures as a proxy for reading volume: Strong comprehenders had significantly higher ART scores than weak comprehenders. In addition, the analysis of fiction book titles showed that strong comprehenders were reading longer, more difficult fiction books than were weak comprehenders, and, as indicated by their Woodcock-Johnson Reading Fluency scores, strong comprehenders were much faster readers than weak comprehenders, so the former could read more text in the same amount of time than the latter. The higher scores of the weak comprehenders on the nonfiction habits composite do not alter these conclusions, given the types of books many weak comprehenders tended to select, as discussed above, and the fact that frequent reading was associated with reading of fiction rather than nonfiction.

Nevertheless, relative to their overall reading abilities, most strong comprehenders still picked very easy fiction books for pleasure reading, on average, about four grades below their estimated level of functioning. Although weak comprehenders

also picked relatively easy fiction books, the difference between estimated reading level and book grade level appeared much smaller for the weak comprehenders than for the strong comprehenders. The smaller difference for weak comprehenders may have stemmed from a variety of factors, such as restricted availability of very easy fiction books, lack of appeal of those books to sixth graders, or reluctance on the part of weak comprehenders to select books that were obviously written for younger children. Conversely, strong comprehenders' selection of fiction far below their reading achievement levels could have reflected restricted availability of appropriately challenging fiction or lack of appeal of that kind of fiction for pleasure reading.

Limitations

As previously noted, an important limitation of questionnaires is that responses may be skewed by social desirability effects. Although there was some of this kind of skewing in our data, children's responses to the questionnaire generally did appear to be truthful. Fully half of the questionnaire, six out of twelve items, required children to name specific titles of books, magazines, newspapers, or comic books. It is much more difficult for children to fake responses on these kinds of items than on multiple-choice items. Moreover, although 14 to 17% of the time children stated that they could not remember a title, they almost never named titles or authors that could not be verified as real. For example, of nearly three dozen authors children named as their favorites, only two could not be verified as real authors; likewise, of nearly 60 different magazines named by children, only two could not be verified as real. Even these answers, however, were not necessarily deliberately faked, because children might have made an honest mistake remembering a title or author's name. In addition, many children did give "socially undesirable" responses to multiple choice items from the RHQ, indicating that they were probably being truthful: Over a quarter of the sample admitted reading books or magazines for pleasure only rarely, once a month or less, and over a third of the sample admitted reading a newspaper only rarely.

The reliabilities of some of the study measures, especially some of those for the composite reading habits scores, were quite modest. Reading habits scores with higher reliabilities might have revealed some stronger relationships with children's reading abilities, especially in the case of the newspaper composite, which was based on only two items. Other limitations of the study include small sample size, the fact that strong comprehenders came disproportionately from the suburban school, and the fact that the sample contained few severely impaired readers. The self-reported reading habits of more severely impaired readers might well differ from those of the weak comprehenders in the present study. Also, in comparing strong and weak comprehenders, children's grade level of functioning in reading was estimated based on several reading comprehension measures that yielded varied grade equivalent scores; data on children's independent reading levels in graded text were not available. Although tests that provide the latter kind of information such as informal reading inventories can also be problematic (Spector, 2005), this information might have helped to interpret children's book choices in relation to their reading abilities, especially for the weak comprehenders.

Educational implications

Despite the limitations described in the previous section, the study provides additional insights into the reading habits of children in this age group in relation to their reading abilities. The study findings support the need for a broad variety of print materials, including magazines, fiction books, and nonfiction books, at a range of reading levels and on a range of topics that appeal to both genders, for programs intended to foster voluntary pleasure reading.

Sixth graders with more modest reading abilities appeared as likely to report reading for pleasure as higher-achieving readers. Thus, if educators can help struggling readers achieve some threshold level of reading skill, then engaging them in voluntary reading for enjoyment appears quite feasible. However, although weak and strong comprehenders did not differ in reported frequency of reading, the results suggested that the two groups likely differed in reading volume as well in their experiences with certain text characteristics, such as those associated with fiction books. Specifically, strong comprehenders appeared heavily oriented toward fiction books for voluntary reading, whereas for weak comprehenders, the results suggested that fiction books may present some particular challenges. On the other hand, certain kinds of nonfiction books, such as those involving specific topics or short vignettes, appeared relatively appealing to many weak comprehenders for voluntary reading. This finding suggests the possibility of using these kinds of nonfiction books to help facilitate new learning for weak comprehenders, in instructional situations where the use of such nonfiction is feasible. For example, a child who is knowledgeable about baseball might learn new comprehension skills, such as information about expository text structure or how to infer word meanings from context, more easily in the context of a nonfiction book about baseball than in the context of other books.

Both strong and weak comprehenders may have derived some important literacy-related benefits from pleasure reading that were not detected in this study. For instance, they may have acquired a knowledge base about specific topics that would promote reading comprehension on related topics, and frequent exposure to printed words may have benefited their spelling. Educators also may wish to encourage literacy habits and love of reading for their own sake, regardless of whether there is a direct benefit to children's literacy skills. Nevertheless, similar to the observations of Carver and Leibert (1995), and Snow et al. (1991), neither group of comprehenders in the present study tended to choose the kind of pleasure reading material that would be likely to boost reading achievement in middle school, where success in reading requires comprehension of challenging fiction and nonfiction, and where further growth in reading largely involves growth in knowledge and comprehension as opposed to more basic reading skills such as word identification or fluency (Chall, 1996; RAND Reading Study Group, 2002; Rupley, Willson, & Nichols, 1998). Strong comprehenders in particular picked pleasure reading materials that were very easy relative to their reading achievement levels. Thus, examination of these sixth-graders' pleasure reading habits suggests that, if the aim is to improve children's reading achievement, simply "getting them to read more" is unlikely to substitute for reading appropriately challenging texts in school, with expert guidance and instruction from a teacher. Encouragement of voluntary pleasure reading outside

of school, especially via appropriately structured voluntary reading programs (e.g., Kim & White, 2008), could be a helpful adjunct to such instruction.

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Appendix

Author recognition test

Directions: On this page are some names of popular authors of fiction books. Some of them are the names of real fiction authors and some are not. Put a check mark next to the names that you know are real authors of fiction books. Do not guess, because guessing can be detected.

_____ J.R.R. Tolkien	_____ C. K. Leong
_____ Mary Pope Osborne	_____ Nancy Rue
_____ Marilyn Jager Adams	_____ Laurie Halse Anderson
_____ Adeline Yen Mah	_____ A. A. Milne
_____ Michael Pressley	_____ Eoin Colfer
_____ Victor H. P. van Daal	_____ Linnea Ehri
_____ Madeleine L'Engle	_____ Benita Blachman
_____ Brian Jacques	_____ Frank Vellutino
_____ J. K. Rowling	_____ Ann Brashares
_____ Linda Siegel	_____ Julia DeVillers
_____ Dav Pilkey	_____ Anne Castles
_____ Lemony Snicket	_____ Louis Sachar
_____ Hollis Scarborough	_____ R. K. Wagner
_____ Meg Cabot	_____ Jonathan Stroud
_____ Stephen King	_____ Cornelia Funke
_____ Hugh Catts	_____ R. L. Stine
_____ Christopher Paolini	_____ James Patterson
_____ Maggie Snowling	_____ Jenny Nimmo
_____ Donald L. Compton	_____ Andrew Biemiller
_____ Isabel Beck	_____ Alexandra Gottardo
_____ Hans Christian Andersen	_____ Lauren Myracle
_____ Catherine McBride-Chang	_____ Lisi Harrison
_____ Blue Balliett	_____ Richard Olson
_____ Carl Hiaasen	_____ Jeanne DuPrau
_____ Peter F. de Jong	_____ Kate Dicamillo
_____ Roald Dahl	_____ Mariam Jean Dreher
_____ Patricia Bowers	_____ Ludo Verhoeven
_____ C. S. Lewis	_____ Philip Pullman
_____ Louise Rennison	_____ Brian Byrne

References

Aaron, P. G., Joshi, M., Gooden, R., & Bentum, K. (2008). Diagnosis and treatment of reading disabilities based on the component model of reading: An alternative to the discrepancy model of LD. *Journal of Learning Disabilities, 41*, 67–84. doi:10.1177/0022219407310838.

Allen, L., Cipielewski, J., & Stanovich, K. E. (1992). Multiple indicators of children's reading habits and attitudes: Construct validity and cognitive correlates. *Journal of Educational Psychology, 84*, 489–503. doi:10.1037/0022-0663.84.4.489.

Anderson, R. C., Wilson, P. T., & Fielding, L. G. (1988). Growth in reading and how children spend their time outside of school. *Reading Research Quarterly, 23*, 285–303. doi:10.1598/RRQ.23.3.2.

Baker, L., & Wigfield, A. (1999). Dimensions of children's motivation for reading and their relations to reading activity and reading achievement. *Reading Research Quarterly, 34*, 452–477. doi:10.1598/RRQ.34.4.4.

Biemiller, A. (1977–78). Relationships between oral reading rates for letters, words, and simple text in the development of reading achievement. *Reading Research Quarterly, 13,* 223–253. doi:10.2307/747307.

Cain, K., Oakhill, J. V., & Bryant, P. (2004). Children's reading comprehension ability: Concurrent prediction by working memory, verbal ability, and component skills. *Journal of Educational Psychology, 96*, 31–42. doi:10.1037/0022-0663.96.1.31.

Carver, R. P., & Leibert, R. E. (1995). The effect of reading library books at different levels of difficulty upon gain in reading ability. *Reading Research Quarterly, 30*, 26–48. doi:10.2307/747743.

Chall, J. S. (1996). *Stages of reading development* (2nd ed.). Fort Worth, TX: Harcourt Brace.

Chiu, M. M., & McBride-Chang, C. (2006). Gender, context, and reading: A comparison of students in 43 countries. *Scientific Studies of Reading, 10*, 331–362. doi:10.1207/s1532799xssr1004_1.

Cipielewski, J., & Stanovich, K. E. (1992). Predicting growth in reading ability from children's exposure to print. *Journal of Experimental Child Psychology, 54*, 74–89. doi:10.1016/0022-0965(92)90018-2.

Connecticut State Department of Education. (2006). *Connecticut Mastery Test-4th Generation*. Hartford, CT: Connecticut State Department of Education.

Cunningham, A. E., & Stanovich, K. E. (1991). Tracking the unique effects of print exposure in children: Associations with vocabulary, general knowledge, and spelling. *Journal of Educational Psychology, 83*, 264–274. doi:10.1037/0022-0663.83.2.264.

Cunningham, A. E., & Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability ten years later. *Developmental Psychology, 33*, 934–945. doi:10.1037/0012-1649.33.6.934.

Duke, N. K. (2000). Print environments and experiences offered to first-grade students in very low- and very high-SES school districts. *Reading Research Quarterly, 35*, 456–457. doi:10.1598/RRQ.35.4.1.

Dunn, L., & Dunn, M. (1997). *Peabody picture vocabulary test-III*. Circle Pines, MN: American Guidance Service.

Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education, 7*, 6–10.

Guthrie, J. T., Wigfield, A., Metsala, J. L., & Cox, K. E. (1999). Motivational and cognitive predictors of text comprehension and reading amount. *Scientific Studies of Reading, 3*, 231–256. doi:10.1207/s1532799xssr0303_3.

Hayes, D. P., & Ahrens, M. (1988). Vocabulary simplification for children: A special case of 'motherese'. *Journal of Child Language, 15*, 395–410.

Hughes-Hassell, S., & Rodge, P. (2007). The leisure reading habits of urban adolescents. *Journal of Adolescent & Adult Literacy, 51*, 22–33. doi:10.1598/JAAL.51.1.3.

Kim, J. S., & White, T. G. (2008). Scaffolding voluntary summer reading for children in grades 3 to 5: An experimental study. *Scientific Studies of Reading, 12*, 1–23. doi:10.1080/10888430701746849.

Krashen, S. (1993). *The power of reading: Insights from the research*. Englewood, CO: Libraries Unlimited.

LaBerge, D., & Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology, 6*, 293–323. doi:10.1016/0010-0285(74)90015-2.

McGrew, K. S., & Woodcock, R. W. (2001). *Technical manual. Woodcock-Johnson III*. Itasca, IL: Riverside Publishing.

McKenna, M., Kear, D., & Ellsworth, A. (1995). Children's attitudes toward reading: A national survey. *Reading Research Quarterly, 30*, 934–956. doi:10.2307/748205.

Nation, K. (2005). Children's reading comprehension difficulties. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 248–266). Oxford, UK: Blackwell.

National Education Association. (2001). *NEA poll on the reading habits of adolescents*. Washington, DC: National Education Association.

National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Washington, DC: National Institutes of Health.

Pitcher, S. M., Albright, L. K., De Laney, C. J., Walker, N. T., Seunarinesingh, K., Mogge, S., et al. (2007). Assessing adolescents' motivation to read. *Journal of Adolescent & Adult Literacy, 50*, 378–396. doi:10.1598/JAAL.50.5.5.

Questar Assessment. (2006). *The degrees of reading power program*. Brewster, NY: Questar Assessment.

RAND Reading Study Group. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. Arlington, VA: RAND.

Rupley, W. H., Willson, V. L., & Nichols, W. D. (1998). Exploration of the developmental components contributing to elementary school children's reading comprehension. *Scientific Studies of Reading, 2*, 143–158. doi:10.1207/s1532799xssr0202_3.

Smith, F. (1988). *Understanding reading*. Hillsdale, NJ: Erlbaum.

Snow, C. E., Barnes, W. S., Chandler, J., Goodman, J. F., & Hemphill, L. (1991). *Unfulfilled expectations: Home and school influences on literacy*. Cambridge, MA: Harvard University Press.

Spear-Swerling, L. (2006). Children's reading comprehension and oral reading fluency in easy text. *Reading & Writing: An Interdisciplinary Journal, 19*, 199–220. doi:10.1007/s11145-005-4114-x.

Spector, J. (2005). How reliable are informal reading inventories? *Psychology in the Schools, 42*, 593–603. doi:10.1002/pits.20104.

Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 21*, 36–406. doi:10.2307/747958.

Stanovich, K. E. (2000). *Progress in understanding reading: Scientific foundations and new frontiers*. New York: Guilford Press.

Stanovich, K. E., & West, R. F. (1989). Exposure to print and orthographic processing. *Reading Research Quarterly, 24*, 402–433. doi:10.2307/747605.

Strommen, L. T., & Mates, B. F. (2004). Learning to love reading: Interviews with older children and teens. *Journal of Adolescent & Adult Literacy, 48*, 188–200. doi:10.1598/JAAL.48.3.1.

Whitehurst, G. J., & Lonigan, C. J. (2002). Emergent literacy: Development from prereaders to readers. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 11–29). New York: Guilford Press.

Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). *Woodcock-Johnson III tests of achievement*. Itasca, IL: Riverside Publishing.