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BRIEF RESEARCH REPORT

Motivational and Cognitive Contributions to Students' Amount of Reading

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The amount that students read for enjoyment and for school is a major contributor to students' reading achievement and knowledge of the world. Consequently, it is important to identify the factors that predict amount of reading. A literature review revealed that motivation, strategy-use, and past reading achievement all may be expected to predict reading amount. To examine these variables, a total of 251 students in Grades 3 and 5 was administered questionnaires of these constructs and a reading test. Results showed that amount of reading for enjoyment was predicted most highly by motivation, when all other variables were controlled statistically in multiple-regression analyses. In contrast, amount of reading for school was predicted most highly by strategy use, when all other variables were controlled. However, these predictions were different for students in Grades 3 and 5. Findings of the study indicate that amount of reading is multiply determined by cognitive and motivational constructs, which is consistent with an engagement perspective on reading development. © 2001 Academic Press

Amount of student reading is important because it enhances both academic and social development in many ways. First, among elementary school children reading achievement (e.g., text comprehension) is substantially predicted by amount of independent reading (Anderson, Wilson, & Fielding, 1988; Cipielewski & Stanovich, 1992). This contribution of reading amount to reading comprehension has been documented with a wide variety of indi-

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cators including diaries, questionnaires, and measures of print exposure, such as a title recognition test for books (Anderson et al., 1988; Cunningham & Stanovich, 1997; Wigfield & Guthrie, 1997).

It may seem obvious that children who read widely and frequently will be high achievers. However, amount of reading is not only correlated to achievement in a simple association, but is a source of *growth* in reading. Several studies document this point by showing that the increase in reading comprehension during an academic year, from fall to spring, is predicted by children's amount of reading in the fall of the year (Cipielewski & Stanovich, 1992; Wigfield & Guthrie, 1997). These studies show that amount of reading is predictive and antecedent, suggesting it is a causal attribute influencing children's reading comprehension levels. Elley (1994) showed that for 9-year-old students, in 32 nations, frequency of reading silently significantly contributed to achievement, after statistically controlling for a variety of health, wealth, and school resource indicators within and across countries.

Amount of student reading influences world knowledge as well as reading achievement (Cunningham & Stanovich, 1997; Stanovich & Cunningham, 1993). It is plausible that students who read widely should gain knowledge about the topics and domains in which they read, and in fact this expectation has been confirmed empirically. In addition to its contribution to world knowledge, amount of reading is related to active participation in social communities. For young children in elementary school settings (Bus, van Ijzendoorm, & Pellegrini, 1995; Morrow, 1996) and young adults in community settings (Guthrie, Schafer, & Hutchinson, 1991), the most active readers are also among the most socially interactive community members. The knowledge and awareness provided by frequent reading activities enables members to discuss a wide range of topics and comprehend the viewpoints of other members in social groups. Consequently, amount of reading plays a major role in the lives of children and young adults, including benefits on reading achievement, world knowledge, and community participation. In view of the multiple benefits for reading frequently and widely, it is of value to examine the extent to which motivational and cognitive characteristics of the individual contribute to the development of frequent reading.

MOTIVATION PREDICTS AMOUNT OF READING

Amount and breadth of children's reading is likely to be influenced by their motivations, beliefs, and sense of self. As Deci (1992) stated, ''people's goal representations are the efficient causes of people's behaviors; in other words, behaviors are said to be determined by intentions to attain various goals, outcomes, or standards'' (p. 168). Reading as an activity is likely to reflect individuals' motivations, beliefs, and personal needs.

Intrinsic motivation refers to the enjoyment of reading for its own sake and the disposition to read frequently. Our view is similar to those of Deci,

Vallerand, Pelletier, and Ryan (1991) and Gottfried (1990), who suggest that motivated students are curious to learn about the world around them. These students seek involvement and the experience of getting lost in a book (Csikszentmihalyi, 1990; Schallart & Reed, 1997). Wigfield and Guthrie (1997) have reported that several aspects of intrinsic motivation, such as curiosity, involvement, preference for challenge, and importance, predict students' amount and breadth of reading. Extrinsic motivation refers to motivational goals of recognition and competition. These motivational goals also predict amount and breadth of reading but not as strongly as the more intrinsic motivations (Wigfield & Guthrie, 1997). In this study, we combined the constructs of curiosity, involvement, preference for challenge, recognition, and competition into one scale of motivation for reading. We wanted to examine the relative contribution of motivation and strategy use to reading amount, but not to differentiate among the aspects of motivation.

STRATEGY USE IMPACTS AMOUNT OF READING

Strategy use is likely to be an additional source to children's frequency and amount of reading. That is, students who state that they are able to use strategies for comprehension also report reading widely (Guthrie, Schafer, Wang, & Afflerbach, 1995). It is likely that strategies are instrumental and empowering for reading. A student who is capable of self-monitoring, rereading, and thereby successfully finding the main idea of text is likely to read more intensely for longer time periods than a student not possessing these strategies. Schunk and Rice (1992) confirmed this conclusion experimentally. They taught 21 poor readers in Grades 4 and 5 strategies and text comprehension skills. The instruction occurred for 35 min a day for 15 days, emphasizing goal setting and feedback for progressing toward their goals. Students who increased their comprehension strategies also increased self-efficacy and their text comprehension improved. Schunk and Zimmerman (1997) summarized a range of evidence that as students' cognitive strategy use increases, their self-efficacy and their disposition to read frequently increases. These studies confirmed the perspective on self-determination proposed by Deci, Vallerand, Pelletier, and Ryan (1991). They argued that students engage in activities more often when they feel cognitively competent to face reading challenges.

PAST ACHIEVEMENT PREDICTS AMOUNT OF READING

Several investigations contain empirical evidence that past achievement predicts amount of reading. For example, Anderson, Wilson, and Fielding (1988) reported that amount of reading in fifth grade was predicted significantly by second-grade reading achievement. Furthermore, Cunningham and Stanovich (1997) argued that reading amount and reading achievement show reciprocal causation. Their longitudinal results support the interpretation that as reading amount (e.g., print exposure) increases, achievement increases

and as achievement increases, reading amount increases. Thus, we entered past reading achievement into this study as a controlling variable in the examination of cognitive and motivational predictors.

Amount of reading is most likely to be a complex expression of a variety of motivational and cognitive qualities of the individual. Based on previous investigations, we expected that students' amount of reading would be influenced by whether they possess intrinsic motivations, such as curiosity, propensity for involvement, and preference for challenge. However, these represent only the goals and intentions of a reader. Although an individual may hold motivational goals and believe she can accomplish the goals, the reader nevertheless requires cognitive strategies for text comprehension. Consequently, we expected that strategy use would contribute to amount and breadth of reading in addition to motivation.

Consistent with a sociocultural perspective on literacy (Salomon & Perkins, 1998), we believe that reading activities are situated. A given reading act takes place in a particular location, time, and social milieu. Two prominent contexts for reading are school reading and reading for enjoyment. Although some reading within school is enjoyable and reading for enjoyment may enhance school achievement, we decided to examine them separately.

This study used a multiple-regression approach to predicting amount of reading for several reasons. We believe that amount of reading is a complex outcome from multiple variables that range widely across individuals. Therefore, we expected the multiple-regression approach to permit us to measure the existing diversity of students and relate them to amount of reading. One limitation of previous studies of motivational predications of amount of reading is that they have not controlled for other associated variables, such as achievement or strategy use (e.g., Wigfield & Guthrie, 1997). Although controls may be introduced with experimental approaches to these issues (Cordova & Lepper, 1994) it is difficult to manipulate motivation and/or strategy use sufficiently to produce different levels of amount of reading within an investigation that was not at least 2–3 years in duration. Consequently, we selected a regressive approach for this study.

We formulated the following questions to guide this investigation: (1) To what extent does motivation predict amount of reading for enjoyment when variables of previous achievement and strategy use were controlled? (2) To what extent does motivation predict amount of reading for school when variables of previous achievement and strategy use were controlled? (3) To what extent do the predictions found in questions 2 and 3 occur in equal strength for students in Grades 3 and 5?

METHOD

Design

Data for this study were drawn from a quasiexperimental investigation designed to examine the effects of instructional intervention on reading achievement (Guthrie et al., 1998). That

study included an assessment administered at the end of the school year including two measures of text comprehension, prior knowledge relevant to the comprehension measures, reading motivation, reading efficacy, and reading amount. All students in the study were included in the present analysis.

Participants

A total of 251 third- and fifth-grade children from three elementary schools in the mid-Atlantic states participated in our study. Each school had a multicultural population consisting of approximately 55% African American, 22% Caucasian, 15% Hispanic, and 7% Asian or other. There were 138 fifth-graders and 113 third-graders from mixed socioeconomic backgrounds, and 47% of the total sample were boys and 53% were girls. Permission to participate in the study was obtained from the participants and their parents.

The three schools in the study were located in a traditionally low-achieving district. In the year of this study, one school had Comprehensive Tests of Basic Skills (CTBS) reading scores for Grade 3 at the 29th percentile and Grade 5 Metropolitan Achievement Tests (MAT) reading achievement was at the 23rd percentile. The second school had a CTBS reading percentile at 39 for Grade 3 and MAT reading at the 36th percentile for Grade 5. The third school was at the 42nd percentile for Grade 3 and the 35th percentile for Grade 5. Additionally, two of the participating schools were designated as Chapter 1.

Measures

The standardized reading comprehension tests used to measure prior achievement were administered to the students by their teachers in October 1995. All other measures were administered in April 1996 to groups of children (10–15 per group) in the participating elementary schools media centers. We told the children that they would be answering questions about their reading and that the questions had no right or wrong answers. Furthermore, in order to ensure equal access among students, we read each question aloud.

We administered three surveys to the students. The Motivation for Reading Questionnaire (MRQ) (see Wigfield & Guthrie, 1997) measures a wide array of students' motivations for reading. We used an abbreviated version of the MRQ containing 28 of the 54 items on the original scale. These items assessed the following five aspects of reading motivation: (a) challenge, e.g., I like it when the questions in the book make me think and I usually learn difficult things by reading (5 items); (b) curiosity, e.g., I read to learn new information about topics that interest me (6 items); (c) involvement, e.g., I make pictures in my mind when I read and I feel like I make friends with people in good books (6 items); (d) recognition, e.g., I like to get compliments for my reading (5 items); and (e) competition, e.g., I am willing to work hard to read better than my friends (6 items). The reliability of these 28 items for the sample in this study was .89 (Cronbach's α).

We measured student strategy use with a Strategy Self-Report Measure. This measure consisted of six items which tapped students' use of reading strategies. The strategies included using background knowledge, self-questioning, integrating multiple texts, and self-regulation. Items included statements such as ''I try to see how what we are learning fits with what I know''; ''I usually find a quiet place to do my school work'', and ''I use questions like why, what, and how to understand my reading.'' The format was a 4-point Likert scale of *strongly agree, agree, disagree,* and *strongly disagree.* The reliability (Cronbach's α) was .75.

Using the Reading Activity Inventory (RAI) developed by Guthrie, McGough, and Wigfield (1994), we measured amount of reading in school and amount of reading for enjoyment. The RAI was developed to assess the breadth of reading in different topic domains and the frequency of reading in each domain according to student self-report. The questionnaire began with two practice items to acquaint the student with item and response format.

The first section of the questionnaire targeted school reading. Items requested students to report whether they had read a given topic (e.g., literature or science) for school, and if so how often. The first question asked, ''Did you read a science book or science textbook for school last week?'' with a ''no or yes'' response format. Next, student were asked, ''If yes, write in the title, author, or specific topic that you read about.'' Space was given for their response. Students who answered ''Yes'' and gave some specific information in the open section were given 1 point. The second question tapped frequency and was, ''How often do you read a science book or science textbook for school?'' Its response format consisted of *almost never, about once a month, about once a week,* or *almost every day.* A similar pair of items was given for literature and history, making a total of six items in school reading (Cronbach's $\alpha = .60$).

In the second section of the questionnaire students reported on the topics and frequency of reading for their own enjoyment. The first question was, ''Did you read a fiction book like a mystery or an adventure last week for your own interest?'' with a ''no or yes'' response format. Next, students were asked, ''If yes, write in the title, author, or specific topic that you read about.'' Space was given for their response. The next item was, ''How often do you read a fiction book like a mystery or an adventure for your own interest?'' Its response format consisted of *almost never, about once a month, about once a week,* or *almost every day.* The 14 items covered topic domains consisting of: fiction, sports, nature, romance, biography, comics, and other (Cronbach's $\alpha = .73$). The specific topics were selected and associated with school or enjoyment based on a previous in-depth interview study of reading motivation and reading amount (Guthrie et al., 1996).

We used standardized reading achievement tests as a measure of students' past performance in reading. For the fifth-graders, we used the comprehension section of the Metropolitan Achievement Test (MAT). We used the vocabulary and comprehension sections of the Comprehensive Test for Basic Skills (CTBS) for the third-graders. Data were converted to *z* scores within each grade for this study.

RESULTS

The variables of motivation, strategy use, reading for enjoyment, and school reading were normalized with a square-root transformation to reduce the effects of skewness which accompany reading questionnaire data (Cipielewski & Stanovich, 1992). The previous achievement variable was normalized by computing z scores within each grade. Missing data in regression analyses were handled with listwise deletion.

The zero-order correlations for all the study's variables are displayed in Table 1. As indicated in the table, for the third-graders, the independent variables consisting of motivation and strategy use were significantly associated with the amount of reading for enjoyment and school. Motivation significantly correlated with reading enjoyment .32 ($p < .01$), and strategy use correlated with reading enjoyment at .22 ($p < .05$). Similarly, for amount of reading in school, motivation correlated at .43 ($p < .01$), and strategy use correlated at .33 ($p < .01$). In the fifth-grade, motivation was significantly associated with reading enjoyment .39 ($p < .01$). Strategy use correlated with reading enjoyment at .32 ($p < .01$) and reading for school at .26 ($p < .01$).

The measures of reading amount for school and reading for enjoyment in Grade 3 were correlated at .52 ($p < .01$) and in Grade 5 at .43 ($p < .05$).

TABLE 1
Correlations of Variables for Grade 3 and Grade 5

	Enjoyment reading	School reading	Reading motivation	Strategy use	Previous achievement
Enjoyment reading	1.0	.52**	.32**	.22*	.16
School reading	.43**	1.0	.43**	.33**	.10
Reading motivation	.39**	.22*	1.0	.66**	.02
Strategy use	.32**	.26**	.36**	1.0	−.01
Prev. achievement	.02	.09	.09	.21*	1.0

Note. Correlations above diagonal are Grade 3; correlations below diagonal are Grade 5.
* $p < .05$.
** $p < .01$.

Additionally, in third grade, motivation and strategy use correlated .66 ($p < .01$), and in fifth grade, motivation and strategy use correlated .36 ($p < .01$). These findings confirm the results of previous studies and indicate that there is a significant association between motivational goals and strategy use (Zimmerman & Schunk, 1989). However, we conducted more stringent tests of the association between these constructs and amount of reading for school and enjoyment using multiple-regression analyses. Means and standard deviations for these variables are in Table 2.

The first theoretical question was, ''To what extent does motivation predict amount of reading for enjoyment when variables of previous achievement and strategy use were controlled?'' To examine this question, we conducted a series of multiple-regression analyses. The dependent variable was amount of reading for enjoyment. The independent variables were motivation, previous achievement, and strategy use. Each variable was entered last

TABLE 2
Descriptive Statistics for All Variables in Grade 3 and Grade 5

	Grade 3			Grade 5			Total		
	M	*SD*	α	*M*	*SD*	α	*M*	*SD*	α
Enjoyment reading	3.60	.73	.76	3.72	.57	.68	3.65	.66	.73
School reading	2.55	.58	.59	2.97	.54	.59	2.74	.60	.60
Reading motivation	10.70	.98	.91	10.35	.76	.85	10.53	.90	.89
Strategy use	4.21	.55	.77	4.32	.34	.71	4.26	.47	.75
Prev. achievement	44.91	30.17		40.48	11.52		42.83	23.21	

TABLE 3
Effects of Motivation, Strategy Use, and Previous Achievement on Reading for Enjoyment in Total Group

Variable	R	R^2	ΔR^2	ΔF	ΔSig.
Controls	.28	.08	.08	7.09	.001
motivation	.36	.13	.05	9.55	.002
Controls	.35	.12	.12	11.83	.000
strategy use	.36	.13	.01	.81	ns
Controls	.33	.11	.11	10.68	.000
prev. achievement	.36	.13	.02	2.85	ns

to examine whether it contributed to reading amount when accounting for the other variables. The procedure was forced entry multiple regression.

The multiple-regression analysis displayed in Table 3 shows the effects of motivation, strategy use, and previous reading achievement on the dependent variable, amount of reading for enjoyment for the total group. In the top panel of Table 3, the first step consisted of entering the control variables of reading achievement and strategy use as a block for that analysis. The equation containing these three variables showed an R of .28 and an R^2 of .08, which was significant, $F(2, 170) = 7.09$, $p < .001$. In the second step, after reading achievement and strategy use were controlled, with motivation added, the R was .36 and the R^2 was .13, showing that motivation accounted for an additional 5% of the variance in reading for enjoyment which was significant, $F(1, 169) = 9.55$, $p < .002$. The next two panels in Table 3 show similar multiple regressions conducted to examine the effects of the other two variables on amount of reading for enjoyment. The second panel shows that with amount of reading for enjoyment as the dependent variable, strategy use did not add significantly after accounting for the other variables of reading achievement and motivation. Likewise, panel 3 shows that previous reading achievement did not add significantly when the other two controlling variables were entered earlier in the regression analysis. The pattern of results revealed by the regression analysis presented in Table 3 indicates that motivation was a significant predictor of reading for enjoyment in both the third and fifth grades when other variables were controlled. This suggests a positive answer to the first question of the study.

The second theoretical question was, ''To what extent does motivation predict amount of reading for school when variables of previous achievement and strategy use were controlled?'' To examine this question, we conducted a similar series of multiple-regression analyses as previously presented. The dependent variable was amount of reading for school. The independent variables were motivation, previous achievement, and strategy use. Each variable was entered last to examine whether it contributed to reading amount when

TABLE 4
Effects of Motivation, Strategy Use, and Previous Achievement on Amount of School Reading in the Total Group

Variable	R	R^2	ΔR^2	ΔF	ΔSig.
Controls	.30	.09	.09	8.85	.001
motivation	.32	.10	.01	1.66	ns
Controls	.28	.07	.07	6.14	.003
strategy use	.32	.10	.03	6.74	.01
Controls	.30	.09	.09	8.70	.000
prev. achievement	.32	.10	.01	1.94	ns

accounting for the other variables. Table 4 presents the results of a set of multiple-regression analyses for amount of school reading with the total group. The first panel of Table 4 shows the finding that motivation did not add significantly when the controlling variables of reading achievement and strategy use were previously entered into the regression analysis. The second panel shows the second multiple-regression analysis. In this analysis, the controlling variables were reading achievement and motivation. These controlling variables produced an R of .26, which was significant, $F(2, 175) = 6.14$, $p < .001$. When strategy use was added into the equation, the multiple R was .32 and the R^2 was .10. Strategy use contributed an increase of 3% of the variance, which was significant, $F(1, 174) = 6.74$, $p < .01$. Panel 3 shows that reading achievement did not add significantly to the prediction of reading amount when the other two controlling variables were entered earlier in the regression analysis. The pattern of results revealed by the regression analysis presented in Table 4 indicates that motivation was not a significant predictor of amount of reading for school for the total group when other variables were controlled. However, for the total group strategy use was a significant predictor of reading amount for school when controlling for other variables. Whereas grade was negatively associated with motivation ($3 > 5$), grade was positively associated with strategy use and reading for school ($5 > 3$). For the total group, the strategy use effect on school reading may partly represent a grade effect.

We conducted additional regression analyses in order to answer the third theoretical question of the study, ''To what extent do the predictions in questions 2 and 3 occur in equal strength for students in grades 3 and 5?'' In these analyses, the controlling variables were used in the same pattern as the previous analyses to examine the potential effects of each independent variable.

The effects of motivation, strategy use, and previous achievement on amount of reading for enjoyment for the grades are in Table 5. The first panel shows a multiple-regression analysis of Grade 5 in which the control-

TABLE 5
Effects of Motivation, Strategy Use, and Previous Achievement on Reading for Enjoyment in Grade 3 and Grade 5

Variable	R	R^2	ΔR^2	ΔF	ΔSig.
		Grade 5			
Controls	.15	.02	.02	.87	ns
Motivation	.38	.14	.12	10.68	.002
Controls	.37	.14	.14	6.23	.003
strategy use	.38	.14	.00	.28	ns
Controls	.38	.14	.00	6.40	.003
prev. achievement	.38	.14	.00	.00	ns
		Grade 3			
Controls	.36	.13	.13	6.58	.002
motivation	.41	.17	.04	4.69	.03
Controls	.40	.17	.17	9.05	.000
strategy use	.41	.17	.00	.41	ns
Controls	.35	.12	.12	6.29	.003
prev. achievement	.41	.17	.05	5.23	.02

ling variables were reading achievement and strategy use. When motivation was added into the equation, the multiple R was .38 and the R^2 was .14. This was an increase of .12, which was significant, $F(1, 75) = 10.68$, $p < .002$. The second panel shows that with amount of reading for enjoyment as the dependent variable, strategy use did not add significantly after accounting for the other variables of reading achievement and motivation. Likewise, panel 3 shows that reading achievement did not add significantly when the other controlling variables were entered earlier in the regression analysis. In sum, this analysis revealed that for third graders, after reading achievement and strategy use were controlled, motivation significantly contributed an additional 12% of the variance in reading for enjoyment.

In the bottom section of Table 5, we present the effects of these variables on amount of reading for enjoyment in Grade 3. The first panel of this section shows a multiple-regression analysis in which the controlling variables were reading achievement and strategy use. When motivation was added into the equation, the multiple R was .41 and the R^2 was .17. This was an increase of 4% of the variance which was significant, $F(1, 90) = 4.69$, $p < .03$. The second panel shows that with amount of reading for enjoyment as the dependent variable, strategy use did not add significantly after accounting for the other variables of reading achievement and motivation. The third panel of this section shows that with amount of reading for enjoyment as the dependent variable, reading achievement added 5% to the variance explained after the other variables were accounted for, which was significant, $F(1, 90) = 5.23$, $p < .02$. In sum, this analysis revealed that for third-graders,

TABLE 6
Effects of Motivation, Strategy Use, and Previous Achievement on Reading for School in Grade 3 and Grade 5

Variable	R	R^2	ΔR^2	ΔF	ΔSig.
		Grade 5			
Controls	.17	.03	.03	1.26	ns
motivation	.23	.05	.02	1.90	ns
Controls	.22	.05	.05	1.99	ns
strategy use	.23	.05	.00	.49	ns
Controls	.22	.05	.05	1.99	ns
prev. achievement	.23	.05	.00	.51	ns
		Grade 3			
Controls	.37	.14	.14	7.42	.001
motivation	.44	.19	.05	5.93	.02
Controls	.42	.18	.18	10.07	.000
strategy use	.44	.19	.01	1.35	ns
Controls	.42	.18	.18	9.88	.000
prev. achievement	.44	.19	.01	1.68	ns

both motivation and previous achievement significantly contributed to the variance in reading for enjoyment when other variables were controlled.

We also examined the effects of these variables on amount of reading for school in Grades 3 and 5 separately. The top section of Table 6 shows that for Grade 5, none of the variables of motivation, strategy use, or previous achievement predicted amount of reading for school when other variables were controlled.

In Grade 3, reading for school was significantly predicted by motivation when controlling the variables of previous achievement and strategy use. The R was .37, $F(2, 92) = 7.42$, $p < .001$. Motivation contributed an additional 5% of the variance in school reading which was significant, $F(1, 91) = 5.93$, $p < .02$. However, neither strategy use nor previous achievement individually contributed significantly to the variance in school reading at Grade 3.

DISCUSSION

This study documented the contribution of several motivational and cognitive variables to students' amount of reading for enjoyment and school. The correlation of student self-reported strategy use and amount of reading confirms previous correlational findings (Guthrie et al., 1995) and experimental results (Schunk & Zimmerman, 1997). The significant correlation of motivation and amount of reading confirmed the results of Wigfield and Guthrie (1997). The present study extended the previous findings by showing that

reading for enjoyment and reading for school are predicted by different variables. Motivation accounted for a substantial proportion of variance in amount of reading for enjoyment when cognitive factors of previous achievement and reported strategy use were controlled. This implies that amount of reading for enjoyment is primarily determined by motivation. In this study, motivation for reading encompassed involvement, curiosity, preference for challenge, recognition, and competition, which were found to be important in previous studies (Wigfield & Guthrie, 1997). If these aspects of motivation are strong, children will read for enjoyment even though their achievement and strategy use may be relatively moderate or low. In sum, although the cognitive and motivation variables showed simple associations with amount of reading for enjoyment, only motivation accounted for a significant amount of variance in reading for enjoyment after all other factors were held constant statistically.

Reading for school among students in the total group showed simple correlations with both cognitive strategy use and motivation. These findings are consistent with the results of Elley (1994), who showed that student self-reported amount of school reading was associated with achievement across all the countries in a 30-nation international study, and Guthrie et al. (1995), who showed that strategy use predicted amount of reading in a national database.

Previous research (Anderson et al., 1988; Cunningham & Stanovich, 1997; Stanovich & Cunningham, 1993) has found that amount of reading is highly predictive of reading achievement and world knowledge. As reading achievement and world knowledge are assumed to be important school outcomes, it is plausible that understanding the determinants of reading amount becomes a valuable research goal. Identification of variables to predict reading amount was informed by existing theories of cognitive and motivational determinants of behavior. For example, self-determination theory (Deci et al., 1991) predicts that motivation is a contributing factor to school achievement and behavior. This expectation has been confirmed for reading in several studies (Gottfried, 1990; Sweet, Guthrie, & Ng, 1998). Our findings are consistent with self-determination theory, which suggests that autonomous, self-determined behavior, such as reading for enjoyment, is positively influenced by motivational variables.

The present investigation extends prior research in two ways. First, previous studies have not distinguished amount of reading for school from amount of reading for enjoyment. For example, studies of reading amount with title recognition and author recognition methods emphasize reading for enjoyment (Cunningham & Stanovich, 1997). Second, only strategy use predicted the amount of school reading when all the other variables were controlled statistically. Motivation did not predict school reading for the total group

when strategy use was included in the controlling variables. This suggests that amount and breadth of school reading is predominately determined by the extent to which students report using cognitive strategies in reading.

A developmental difference between the Grade 3 and Grade 5 students in reading for enjoyment was evident. Among grade 5 students, motivation most clearly predicted reading for enjoyment. When other variables were controlled, motivation continued to explain reading for enjoyment at the fifth-grade level. At Grade 3, motivation predicted reading for enjoyment when other variables were controlled, but previous achievement was also a prominent predictive variable. Third-graders' amount of reading was dependent both on satisfactory achievement and motivation, whereas fifth-graders become more markedly dependent on motivation.

Developmental differences between students in Grades 3 and 5 also appeared for school reading. In Grade 3, motivation was a substantial contributor when other variables were controlled. However, in Grade 5 none of the variables in this investigation predicted amount of school reading when other variables were controlled. Although the simple correlations of school reading with motivation and strategy use were significant, neither contributed uniquely. In this study, school reading was uniquely predicted by motivation for Grade 3, but school reading was not uniquely predicted by any of the constructs in Grade 5.

This study also suggests that reading amount is socially mediated as well as sensitive to developmental differences. Whereas reading for enjoyment was most strongly predicted by motivation, reading for school was most strongly predicted by strategy use when other variables were controlled. These results accord well with the sociocognitive perspective, which suggests that reading is situated in a social milieu. That is, social context is likely to influence which variables predict reading amount. From the sociocognitive perspective (Scribner & Coles, 1981), high levels of cognitive expertise in a domain are associated with socially constructed practices. The socially constructed practices in a particular setting (e.g., the classroom) are associated with forms of expertise that are relatively distinctive to that setting. In school reading, teacher assignments are prevalent and demands are placed on cognitive competence and strategy use. In contrast, when reading for enjoyment, student interests prevail and reading amount is determined more strongly by motivation than cognitive constructs. The finding that strategy use predicted school reading, whereas motivation predicted reading for enjoyment, is consistent with the perspective that social contexts mediate the variables that predict behaviors.

Several limitations of this study should be noted. The measures of all variables except previous achievement were self-reported. Students are often disposed toward socially desirable responses on questionnaires, which could reduce variance and consequently produce an underestimate of the observed

associations. This bias could affect groups differently, although this is unknown. An extensive discussion of the trade-offs of different measures of reading amount is provided in Wigfield and Guthrie (1997). In addition, the reliabilities of the measures were moderate, which may also attenuate the correlations of variables. In particular, school reading had a lower reliability and was slightly less predictable than reading for enjoyment. It is possible that the fifth-graders showed slightly lower predictions than third-graders due to a relatively lower variance in several variables. However, motivation showed this effect the strongest, but motivation was a strong predictor at Grade 5, thus reducing the severity of this limitation. Because this study was conducted with data from a larger study in which half of the students received an instructional intervention, the variances and correlations among variables may have been increased. Thus, confirmation with a larger sample is needed to assure generalizability of the findings. Finally, there are likely to be additional cognitive and motivational variables that should be added in future studies to improve the prediction of reading amount.

Future studies of the cognitive and motivational predictors of amount and breadth of reading should attempt several delineations. First, it may be useful to subdivide school reading. For students in Grade 5, it may be necessary to distinguish between literature (stories and narratives) and science or historical reading. Perhaps one set of predictors will be powerful for literature and another set for information book reading. It may also be useful to delineate cognitive strategies. Whereas some strategies may be more valuable for literature, others may be valuable for information book reading. Further, the interaction of motivation and cognitive strategies should be examined. In reading for enjoyment, motivation may be more important for students who do possess competence and awareness of cognitive strategies than for students with less cognitive competence. In addition, the social interaction patterns of students merit inclusion in these studies. The social disposition of students to read with friends or share books should be examined in concert with the motivational characteristics and cognitive strategies as predictors of reading amount. Furthermore, structural equation modeling that charts a network of relationships is likely to be useful in examining the interplay of variables that contribute to individual differences in the amount and breadth of a person's reading for various purposes.

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