Benefits of Opportunity to Read and Balanced Instruction on the NAEP

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ABSTRACT The National Assessment of Educational Progress (NAEP) requires reading comprehension processes that may be increased by students' amount of engaged reading, parental education, and gender, along with balanced reading instruction and opportunity to read. To examine the effects of those variables on reading achievement and engagement, the authors analyzed the 1994 Grade 4 Maryland NAEP with hierarchical linear modeling to construct both between-school and between-teacher models. Amount of engaged reading significantly predicted reading achievement on the NAEP; after parental education was statistically controlled. Balanced reading instruction significantly predicted reading achievement after accounting for students' engaged reading and parental education. Findings confirmed expectations from the proposed theoretical perspective on reading engagement. Policy implications included an emphasis on some instructional variables in the reading engagement model.

Key words: classroom effects, engaged reading, NAEP, opportunity to read, reading achievement

An empirical study of reading achievement on the Maryland National Assessment of Educational Progress (NAEP; Donahue, Voelkel, Campbell, & Mazzaro, 1999) was conducted so that issues relevant to the state's systemic reform could be examined. The study was informed by existing research on an engagement model of reading (Guthrie & Wigfield, 2000). In the model, reading achievement is expected to be predicted by students' amount of engaged reading, and the students' amount of engaged reading is expected to be influenced by the quality of classroom instruction. In particular, we investigated the instructional variables of balanced reading instruction and opportunity to read in the classroom because these were measured on NAEP questionnaires.

Maryland is widely recognized for its systemic reform in education. Known as the Maryland School Performance Program (MSPP), the initiative began in 1991 with a statement of learning objectives and a statewide performance assessment administered annually. In 1998, the school superintendent commissioned a statewide reading task force to chart the state's progress in reading. Progress indicators included the NAEP and the statewide performance assessment (MSPAP) on reading and other content domains. The task force observed that gains in reading achievement lagged behind the other content domains. Although progress in reading at Grade 3 was comparable with other areas, progress in Grade 5 was minimal, and actual declines in achievement were observed in Grade 8. Consequently, the superintendent instructed the task force to identify characteristics of classrooms and schools that would hold promise of accelerating the pace of gains in reading. The task force reviewed research literature to make its recommendations for improved instruction. However, relevant data from such national indicators were not available for inclusion in the task force report. The first author, who served on the task force, conducted this study because of its probable relevance to the policy issues of improving reading achievement via instruction.

Three criteria are useful to identify characteristics of teaching and instruction that may be relevant for policy. First, a theoretically plausible connection between the cognitive demands of the statewide assessment in reading and instructional changes should be described. That is, characteristics of reading tasks on the statewide performance assessment should be analyzed for their cognitive requirements. Second, instructional processes in classrooms that enable students to meet the cognitive requirements should be defined. The instructional variables of interest should be positively correlated with achievement. To be relevant for policy, a variable such as the time allocated to reading instruction should be correlated positively with a widely accepted indicator of achievement such as NAEP or MSPAP scores. Third, the criterion of "generalizability" should be used. Desirable characteristics of instruction or schooling expected to influence achievement statewide cannot be drawn from a limited or local sample. It is necessary to use samples of students representative of the state popu-
lation. Statistical analysis procedures that permit generalization to the state population also are needed. We used theoretical significance, correlation to achievement, and generalization to a statewide population to identify promising instructional context factors for Maryland.

Reading Achievement in NAEP at Grade 4: Cognitive Requirements for Successful Performance

To identify practices that influence reading achievement, one should describe the cognitive competencies required for high achievement on the NAEP. At Grade 4, the NAEP places a strong emphasis on construction of meaning from extended text. Students are given authentic stories and complete information texts of 500–1,000 words. Students answer open-ended questions requiring both short and long written responses.

Reading comprehension processes required for success on the Grade 4 NAEP can be illustrated with two examples. The first example shows the reading processes possessed by a large majority of fourth graders. A text given in the 1998 NAEP was an 800-word article from *Highlights for Children*, containing the following passage: "Crabs are able to replace their lost limbs. If a leg or claw is seriously injured, the crab drops it off. The opening that is left near the body closes to prevent the loss of blood. Soon a new limb begins growing at the break." Students were asked the question, "What is the most interesting thing you learned about this passage from blue crabs?" An acceptable response was "that they can loose [sic] a leg and grow it back." Most of the students (97%) at the basic level gave a similar acceptable response (Donahue et al., 1999). Students at the basic level can answer simple questions related directly to specific words and the literal meaning of the text.

Higher level NAEP reading achievement requires more complex processing. To illustrate with a second example, students in the 1998 NAEP were given the question, "Describe the appearance of a female blue crab that is carrying eggs" on the same 800-word text. An acceptable response was, "the egg mass sometimes looks like a [sic] orange-brown sponge and carries up to one million eggs and the crab has pinchers." Only 29% of the students scoring basic on the assessment gave a response of that quality. That response required students to integrate multiple details from different portions of the text. After integrating and remembering the information, students were expected to compose a coherent statement. Comprehension at that level relies on several cognitive competencies, including (a) understanding the simple meaning as represented in the text, (b) integrating new information with background knowledge, (c) self-monitoring during reading, (d) synthesizing information from multiple texts, and (e) composing a well-organized statement (Lorch & van den Broek, 1997; Pressley, 1997). The strategy used in this study was to identify student characteristics and instructional practices that were aligned with the cognitive requirements of NAEP reading tasks.

The descriptors of reading and policy were entered into the retrieval systems of ERIC and PsycINFO to locate recommendations for instructional context. The search yielded recommendations for instructional contexts that included the following: (a) quality of the learning standards and assessments (Pearson, 1998); (b) emphasis on intervention in high-poverty schools (Thompson, 1996); (c) importance of full implementation and coping with administrative barriers (Allington, 1991); (d) reduced class size; (e) constructivist approaches to early literacy (Phillippi, 1998); (f) quality of preservice education for teachers (Hinkle, Profitt, Palotto, & Rosenthal, 1998); (g) involvement of school boards in districtwide reading programs (Borska, 1997); (h) emphasis on an abundance of books and diversity of texts (Guthrie, Schaf, VonSecker, & Alban, 2000); (i) processes of teaching for understanding in reading and schoolwide curricula and improvement of teaching capacity in the school as a system (Floren, 1995); (j) emphasis on teacher engagement in self-improvement and understanding of diverse priorities and values among educators (Mosenthal, 1999); and (k) broader dissemination of NAEP results on statewide assessments (Bullock & DeStefano, 1998).

Although each of the characteristics of classroom and school environments was cogently argued, the evidence supporting them did not meet the latter two criteria that we proposed—correlation to achievement and generalizability. That is, the characteristics were not shown to possess both correlation with an accepted indicator of achievement and generalizability to a statewide sample. Therefore, their usefulness for statewide reform processes was limited. In view of those limits, we used the cognitive analysis of NAEP reading tasks as a basis for identifying instructional processes that will increase reading achievement on policy indicators.

Reading Engagement: Policy-Relevant Role in Increased Achievement

On the basis of previous research, we expected that students’ amount of engaged reading would predict reading achievement. We defined engaged reading as the joint functioning of motivation, strategy use, and conceptual knowledge during reading (Guthrie et al., 1998). Higher achievers in reading are relatively more engaged in a wide range of reading activities than are lower achievers (Guthrie, Wigfield, Metsala, & Cox, 1999). Students with high reading comprehension are intrinsically motivated (Wigfield & Guthrie, 1997), use their knowledge to comprehend (Anderson & Pearson, 1984), employ reading strategies effectively (Pressley, 1997), and share literary interest with peers and family members (Goatley, Brock, & Raphael, 1995). Recent studies reveal that reading engagement is a cluster of student attributes including motivation, strategies, knowledge, and social interactions in reading activities that are associated with achievement (Guthrie & Anderson, 1999).

In 1994, the NAEP began collecting indicators of stu-
students’ reading engagement. One of several items on the student questionnaire at Grade 4 asked students to report the number of pages they read each day in school and for homework. Students who reported reading 11 or more pages per day had a higher reading achievement than did students who reported reading 6–10 pages per day. The students who read the least number of pages, 5 or fewer per day, had the lowest achievement level. Number of pages read each day for school and homework is an extremely simple indicator of engaged reading. It does not reflect all aspects of engagement as previously defined. Furthermore, the reported association of that indicator with achievement was not controlled for differences of gender or mother’s education, both of which are likely to correlate with engagement and achievement. It is important, therefore, to use a more fully representative construct of reading engagement and to control the effects of gender and mother’s education in associating reading engagement with reading achievement.

We expected that success in reading comprehension tasks of the kind contained in NAEP testing would be increased by reading engagement. Reading research suggests that the cognitive processes that occur during reading are acquired slowly (Kintsch, 1998; Graesser, Singer, & Trabasso, 1994). Therefore, high amounts of cognitive processing are needed to acquire expertise in reading comprehension. Consistent with this perspective, there is increasing evidence that amount of reading is correlated with reading achievement. Whether it is measured by children’s diaries (Anderson, Wilson, & Fielding, 1988), print exposure (Cunningham & Stanovich, 1997), or questionnaires (Guthrie, Anderson, Alao, & Rinehart, 1999), amount of reading is correlated with achievement even when background variables of parental socioeconomic status (SES), nonverbal intelligence, background knowledge, and reading motivation are statistically controlled. However, those studies were localized and used costly measurement techniques (e.g., diaries). Therefore, we examined whether amount of reading engagement would increase reading achievement in a national sample using indicators from a student questionnaire administered with the NAEP.

Opportunity to Read: Classroom Practices Associated With Reading Engagement

Morrow (1996) reported that when teachers make time available for intensive reader text interaction, reading achievement can increase. In addition, making a rich array of books available increases achievement. When trade books are systematically integrated into instructional and curricular activities, achievement and interest increase (Morrow). Furthermore, teacher support for student autonomy is important for engagement. Teachers who enable students to find books related to their interests and support students’ processes of choosing authors or topics are able to increase cognitive engagement in reading (Sweet, Guthrie, & Ng, 1998). We defined the construct of opportunity to read as the teacher’s support for a high amount of reading engagement inside and outside the classroom. Although opportunity to read appears to be a promising classroom practice, it has not been examined with a large national data set such as the NAEP.

Balanced Reading Instruction: Classroom Practices Associated With Reading Achievement

A substantial number of reading experts recommend balanced reading instruction at the elementary grades. Recently issued work by Hiebert and Raphael (1998), Pressley (1998), and Cunningham and Hall (1998) contain common themes. Although each study is distinctive, they all propose the following: (a) direct instruction in comprehension strategies, (b) extensive reading of narrative and informational texts, (c) extended writing about text, and (d) self-selected reading from a variety of genres and difficulty levels matched to student ability. Each dimension has been individually substantiated in correlational or experimental research, and outstanding teachers have been shown to use all of these classroom practices (Pressley et al., 1998). However, little data show that the composite of balanced reading instruction is associated with achievement. Furthermore, the effects of balanced reading instruction have not been examined with a policy-relevant sample such as the Grade 4 NAEP. Therefore, we attempted to examine the extent to which balanced reading instruction in elementary school classrooms was associated with achievement on the NAEP in reading.

Developing engaged readers is a prominent goal of teachers. A recent national survey (Baumann, Hoffman, Moon, & Duffy-Hexter, 1998) showed that a goal of 94% of teachers was to help students develop into independent readers who were motivated to choose books and enjoy literature. Providing opportunity to read was frequently reported as a means to that end. Teachers stated that children should be immersed in literature and literacy activities to accelerate their development. In a similar vein, 72% of fourth- and fifth-grade teachers reported moderate or greater use of chapter trade books to increase opportunities to read. Balanced reading instruction was also an aim of a majority of teachers. In the national survey, 89% of elementary teachers reported that they attempted to combine skill teaching with literature-based instruction. Most third- through fifth-grade teachers regularly taught comprehension (89%) and vocabulary (80%) and used activities to evoke response to literature (79%) (Baumann et al.). The limitation of the survey was that it did not indicate whether the goals and practices increased student reading achievement or reading engagement.

Questions Guiding This Study

Our view is depicted graphically in Figure 1. Section A proposes that engaged reading contributes to reading
achievement, along with gender and mother’s education. Opportunity to read (OTR) and balanced reading instruction (BRI) also may contribute to reading achievement. The lack of a path from OTR to achievement shows that that effect was not statistically significant in the final statistical analysis. Section B shows that OTR and BRI may contribute to engaged reading when students’ gender and mother’s education are accounted for. The lack of a path from BRI to engaged reading shows that this effect was not statistically significant in the final statistical analysis.

The following questions guided our study: (a) To what extent does reading engagement predict reading achievement after accounting for gender and mother’s education in a Maryland sample? (b) To what extent does opportunity to read contribute to reading achievement and reading engagement when gender and mother’s education are accounted for in a Maryland sample? (c) To what extent does balanced reading instruction contribute to reading achievement and reading engagement when accounting for gender and mother’s education in a Maryland sample? (d) How are the variables of reading engagement, balanced reading instruction, and opportunity to read distributed in Maryland?

Method

Data Source

The data for this study were drawn from the 1994 NAEP Trial State Data collection. Data from the 1998 NAEP had not been released when the study was completed and other recent data sets did not contain state-level data with student and teacher questionnaires on reading. In this assessment, a multistage sampling design was used to include the following: (a) selection of schools, both public and private and (b) selection of students within the identified schools. Sampling weights were computed to account for disproportionate representation of African American and Hispanic students from urban schools and lower sampling weights from very small schools. In the present analyses, the weighting was applied to the Maryland sample of 577 students used in HLM analyses, which allowed generalizations to the full population of Grade 4 students in Maryland. Students with limited English proficiency or individualized education plans were included in the assessment unless a school team decided they were incapable of taking part meaningfully. After exclusions, 95% of the identified students participated in the assessment.

Demographic characteristics of students in the original NAEP sample are available in the Reading Report Card (Campbell, Voelkl, & Donahue, 1997). Because the HLM does not tolerate missing values in between-group analyses, the actual sample size was smaller than the original sample size (see Table 1). In our study, there were 54% boys and 46% girls. For education background, we used mother’s education and placed students into categories of low or high. The low category included students with mothers who graduated high school or did not finish high school. Students with mothers who had additional education after high school were represented in the high category. The study sample had 76% high educational background and 24% low educational background. To form ethnic groups, we placed students into traditionally high-achieving (Caucasian and Asian) and traditionally low-achieving (African American, Hispanic, and Other) groups. The study sample contained 65% Caucasian and Asian participants and 35% of the participants designated as Other.
Table 1.—Demographic Characteristics of Students

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Percentage</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td>380,418</td>
</tr>
<tr>
<td>Female</td>
<td>47</td>
<td>333,156</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not finish high school</td>
<td>6</td>
<td>43,780</td>
</tr>
<tr>
<td>Graduated high school</td>
<td>23</td>
<td>165,136</td>
</tr>
<tr>
<td>Some education after high school</td>
<td>14</td>
<td>97,451</td>
</tr>
<tr>
<td>Graduated college</td>
<td>57</td>
<td>407,208</td>
</tr>
<tr>
<td>Mother's education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>29</td>
<td>208,915</td>
</tr>
<tr>
<td>High</td>
<td>71</td>
<td>504,659</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White and Asian</td>
<td>82</td>
<td>588,620</td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
<td>124,954</td>
</tr>
</tbody>
</table>

Note. Numbers represent weighted data.

Measures

Reading achievement. We based student reading achievement on the NAEP framework, which included literary and information texts; 50% of the questions were addressed to each text type. One item type required initial understanding or developing an interpretation of text. The items requested the reader to identify explicit text meaning and constituted 49% of the text. Twenty-five percent of the items required the reader to connect background knowledge with the text; 27% required the reader to evaluate text and make judgments about it using external criteria. There were 39 multiple-choice questions, 37 short-constructed response questions, and 8 extended-response questions for eight texts. In the matrix sampling, or BIB (balanced incomplete blocks) spiraling, a particular student participated in two 25-min blocks of tasks. Each block contained at least one literary text or information passage and 9–11 multiple-choice and constructed-response questions, including one extended response. Each student was assigned a plausible value, which is an estimate of the student’s score had the student answered all 84 questions on all eight texts.

In one task, students read a story titled “Hungry Spider and the Turtle” from Cow-Tail Switch and Other West African Stories by Harold Courlander. The story was approximately 1,000 words and began as follows: “Spider was a hungry one, he always wanted to eat. Everybody in Ashanti knew about his appetite. He was greedy, too, and always wanted more than his share of things. So people steered clear of spider.” One multiple-choice question was the following: “When turtle remains quiet about his mistreatment by spider, the author wants you to (a) believe turtle is afraid, (b) have sympathy for turtle, (c) feel dislike for turtle, and (d) think turtle deserved no dinner.” The correct answer is b, which was identified by a large majority of Grade 4 students. Another question asked the following: “There is a saying, ‘Don’t get mad, get even.’ How does this apply to the story?” An acceptable response typical of students who scored high on the test (e.g., at the proficient level) was the following: “Spider invited turtle to eat and didn’t let him so when spider wanted to eat turtle didn’t let him.” That task requires comparing the story theme to the quote in the question. Higher scores reflect thematic understanding, evaluation, and judgment. We analyzed the plausible values in the NAEP data with HLM, as recommended in the manual for secondary analysis of NAEP 1994 data (O’Reilly, Zelenak, Rogers, & Kline, 1996).

Engaged reading. In the 1994 Reading Assessment, NAEP administered a 37-item student questionnaire in two different sections. We constructed the variable of engaged reading from the questionnaire with an existing theoretical framework (Guthrie & Anderson, 1999). In that framework, engaged reading is intrinsically motivated (Deci, Vallerand, Pelletier, & Ryan, 1991), reflecting a disposition to read extensively for enjoyment and information. To represent that aspect of engaged reading, we selected two items consisting of the following: (a) How often do you read for fun on your own time? and (b) How often does your teacher give you time to read books you have chosen yourself? The response format for those questions was the following: (a) never or hardly ever, (b) once or twice a month, (c) once or twice a week, and (d) almost everyday. Those items referred to self-selected reading both in school and out of school.

A second aspect of engaged reading is time spent reading. It has been shown that intrinsic motivation, which is central to engagement, increases the time readers spend in silent reading of self-selected material (Wigfield & Guthrie, 1997). To represent that aspect of reading engagement, we selected the following item: “How often does your teacher ask you to read silently?” The response format was: (a) never or hardly ever, (b) once or twice a month, (c) once or twice a week, and (d) almost every day.

A third aspect of engagement is book seeking. Engaged readers have well-formed reading interests (Schiefele, 1999). They pursue those interests by participating actively in book clubs or library activities (Gaultley et al., 1995) and by reading (McLloyd, 1979). To represent that aspect of engagement, we identified the following item: “How often do you take books out of the school library or public library for your own enjoyment?” The response format was: (a) never or hardly ever, (b) once or twice a month, (c) once or twice a week, and (d) almost every day. Having identified those items on a theoretical basis, we conducted a principal components analysis restricted to them. The four items had loadings of .68, .70, .49, and .51, respectively, accounting for 36% of the variance. The Cronbach alpha reliability was .41.

To compare high, moderate, and low levels of engaged reading, we divided the distribution of total scores into three groups representing the bottom third, middle third, and top third of the frequency distribution. The engaged reading scores ranged from 6 to 16. Students in the low-engaged group were 25.8% of the population, with scores ranging from 4 to 11. Students in the moderate-engaged group had
scores of 12 and 13 and made up 30.3% of the population. Highly engaged students had scores of 14 to 16 and made up 43.8% of the population.

**Opportunity to read.** Instructional characteristics examined in this study included opportunity to read and balanced reading instruction. Those characteristics were derived from a teacher questionnaire in the 1994 NAEP, with 31 items on reading instruction and classroom activities. Ninety-seven percent of teachers in the study completed questionnaires on their instruction and background. To construct a variable representing opportunity to read, we identified items to represent provision of a variety of texts, support for student autonomy or choice, social interaction surrounding literacy, and extended time for reading (Goatley et al., 1995; Guthrie et al., 1996; Morrow, 1996).

To represent the provision of text variety for instruction, we selected the following item: “How often do you use a variety of books to teach reading (e.g., novels, collections of poetry, nonfiction)?” The response format was: (a) never or hardly ever, (b) once or twice a month, (c) once or twice a week, and (d) almost every day. To further represent a variety of text, we selected the following item: “How often do you send or take the class to the library?” The format for responding was: (a) never or hardly ever, (b) once or twice a month, (c) once or twice a week, and (d) almost every day.

In addition to using a wide range of texts in instruction, teachers providing opportunity to read encourage self-selected reading activities. Both autonomy support (Skinner, Wellborn, & Connell, 1990) and encouragement of independent reading (Morrow, 1996) are associated with intrinsic motivation. To represent teachers’ support for student autonomy and choice, we used the following item: “How often do you give students time to read books they have chosen as part of reading instruction?” The alternatives were: (a) never or hardly ever, (b) once or twice a month, (c) once or twice a week, and (d) almost every day.

Discussion of texts and social interaction with peers surrounding books is likely to increase reading opportunity. Not only have peer-led discussions improved competence in interpreting literature (Almasi, 1995) but a socially supportive reading environment increases intrinsic motivation for reading (Ng, Guthrie, McCann, Van Meter, & Alao, 1998) and amount of reading (Morrow, 1996). To represent students’ discourse about reading, we selected the following item: “How often do you ask students to talk with each other about what they have read as part of reading instruction?” Response format was identical to other formats in the teacher questionnaire.

An important aspect of opportunity to read is the provision of time for reading. Increasing evidence suggests that proving time for sustained reading that is integral to the curriculum is an essential ingredient of engagement (Guthrie, Wigfield, & VonScheer, 2000). For that aspect for opportunity to read, we selected the following item: “How often do you ask students to read silently as a part of reading instruction?” The response format was identical to others in the teacher questionnaire. The principal components analysis of those items showed item loadings of .74, .52, .64, .74, and .42. The Cronbach alpha was .60.

To compare high, moderate, and low levels of opportunity to read, we divided the distribution of total scores into three groups representing the bottom third, middle third, and top third of the frequency distribution, which had a range of scores from 10–20. Students in the low group were 26.3% of the population, with scores ranging from 10–15. Students in the moderate group had scores of 16 and 17 and made up 34.1% of the population. The high group had scores of 18–20 and were 39.5% of the population.

**Balanced reading instruction.** A currently recognized approach to conceptualizing, organizing, and implementing reading instruction is termed balanced reading instruction. That approach includes providing explicit teaching of cognitive strategies such as summarizing and evaluating text (Hiebert & Raphael, 1998; Pressley et al., 1998). The item we used to represent that aspect of balanced reading instruction was the following: “How often do you ask students to write about something they have read?” The response format was: (a) never or hardly ever, (b) once or twice a month, (c) once or twice a week, and (d) almost every day.

When teachers provide balanced reading instruction, they also use literature in the classroom, often in the form of trade books combined with a basal. To capture the breadth of materials used in instruction, we used the following item: “What type of materials form the core of your reading program?” The response format was: (a) primarily basal, (b) both basal and trade books, and (c) primarily trade books. Teachers with relatively higher scores provided a comparatively wide range of literature for reading and writing.

In balanced reading instruction, students often participate in individual and group projects. As some studies have documented, individual and group projects provide extended reading, writing, and inquiry opportunities that often are associated with achievement (Guthrie et al., 1999). To represent that aspect of balanced reading instruction, we used the following item: “How often do you use individual or group projects to assess reading?” The response format was: (a) never or hardly ever, (b) once or twice a month, (c) once or twice a week, and (d) almost every day.

Many teachers who provide balanced reading instruction support the writing process. Those teachers teach the writing process explicitly by asking students to write about what they have read and then evaluate the writing as a basis for guiding instructional decisions. We represented that aspect of balanced reading instruction with the following item: “How often do you ask students to write paragraph-length responses about what they have read as an aspect of assessment?” The response format was: (a) never or hardly ever, (b) once or twice a month, (c) once or twice a week, and (d) almost every day. In addition, items regarding use of work sheets and frequency of quizzes were reverse coded and included. Principal components analysis showed item loadings of .49, .79, .59, .56, .55, and .48. That finding shows that the items
formed a coherent pool of indicators of the abstract construct of balanced reading instruction; Cronbach alpha was .60.

To compare high, moderate, and low levels of balanced reading instruction, we divided the distribution of total scores into three groups representing the bottom third, middle third, and top third of the frequency distribution. The frequency distribution had a range of scores from 7–22. Students in the low group were 29.6% of the population, with scores ranging from 7–14. Students in the moderate group had scores of 15 and 16 and made up 28.1% of the population. The high group had scores of 17–20 and were 42.3% of the population.

**Analytical model.** We used HLM to examine the data (Bryk, Raudenbush, & Congdon, 1996). A feature of HLM is that it accommodates the clustered nature of data in designs such as in this study. Within groups, such as classrooms or schools, and scores of individuals may show *intra-class correlation* (ICC), which refers to within-group clustering. When the ICC exceeds .10, analysis of variance underestimates the standard errors and inflates Type I error, thus warranting HLM. The total variance was partitioned by HLM into within-group and between-group sets and enabled us to control the outcome variables for the effects of mother’s education and gender.

In HLM, the definition of the group is often the school. The resulting analysis provides evidence regarding school effects on dependent variables. In addition, one can use the classroom as the definition of the group. Conducting HLM with the teacher as the unit of analysis at Level 2 provides evidence of classroom or teacher effects on the dependent variables. We computed the intraclass correlation and between-group effects with two analyses. One was the analysis of between-school variation and the other analysis was a between-teacher analysis. Although a three-level analysis is possible, there were too few teachers per school ($M = 2.1$) to provide a stable analysis.

**Results**

Correlations among the variables in the study are represented in Table 2. Mother’s education and gender correlated significantly with achievement, engaged reading, balanced reading instruction, and opportunity to read; therefore, both were used as controlling variables. Means and standard deviations of reading achievement for the demographic and instructional groups achievement are presented in Table 3. Mean achievement increased as amount of balanced reading instruction increased from low, to moderate, and to high for all subgroups, with the exception of boys with low mother’s education. Mean engaged reading increased as opportunity to read increased from low, to moderate, and to high levels for all demographic subgroups, with the exception of girls with low mother’s education who were lower achievers than expected (see Table 4); girls with moderate opportunity to read also were lower achievers than expected.

**Unconditional HLM**

The first step in the analysis of both the school-level and teacher-level models was to conduct a fully unconditional two-level HLM to partition the variance into between-group and within-group components. Results can be interpreted in the same way as a one-way analysis of variance with random effects. Variance estimates produced by the unconditional HLM are used to calculate ICC, an index that measures the degree to which members of the same group (e.g., a classroom or a school) respond in a more similar manner than do members of different groups. Adjusted ICCs account for the unreliability of the group means (see Table 5). Adjusted ICCs at the teacher level were .55 for achievement and .45 for engaged reading. At the school level, the adjusted ICCs were .35 for achievement and .18 for engaged reading. There was more between-group variability for teachers than for schools. That is, the variance attributable to differences between teachers was larger than variance attributable to differences between schools. The non-zero ICCs provided justification for using HLM to address our research questions.

**Unconditional Within-Group HLM**

The unconditional within-class models estimate individual outcomes in achievement as a function of the following: (0) group mean achievement, (1) mother’s education, (2)

<table>
<thead>
<tr>
<th>Table 2.—Correlations Among Outcome, Instruction, and Background Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Achievement</td>
</tr>
<tr>
<td>Balanced reading instruction</td>
</tr>
<tr>
<td>Opportunity to read</td>
</tr>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>Mother’s education</td>
</tr>
</tbody>
</table>

*Note. Achievement is the mean of five plausible values.***p < .01.*
gender, and (3) engaged reading (see Table 6). Predictors were grand-mean centered. The intercept is the predicted achievement of a student whose mother’s education is equal to the grand mean for mother’s education, whose amount of engaged reading is equal to the grand mean of engaged reading, and where the gender gap is equal to the grand-mean gender gap. The mean achievement can be interpreted as the level of a student’s achievement when differences attributable to mother’s education, gender, and engaged reading are zero. Effect sizes (ES) for the predictors were computed by dividing each coefficient by the pooled within-group standard deviation in the fully unconditional model (see Table 6). For example, when the teacher was the unit of between-group analysis, mean student achievement was 223.15. The ES of mother’s education was .36, which was not significant. Gender was not included in this analysis because it produced ill conditioning when combined with mother’s education. The ES for engaged reading was .19, (p < .001). For engaged reading at the teacher level, gender had an ES of .66 (p < .001). Mother’s education could not be included because it produced ill conditioning. At the school level, the effect size for engaged reading on achievement was .20 (p < .001), when mother’s education was included as a predictor. Gender could not be included because it produced ill conditioning. At the school level, gender had an ES of 1.2 (p < .01) on engaged reading.

Students were divided into high, moderate, and low levels of engaged reading. As shown in Figure 2a, highly engaged readers had higher achievement than moderately engaged readers who had higher achievement than students with low reading engagement. The relationship of engagement and achievement to the level of mother’s education is

<p>| Table 3.—Achievement Means and Standard Deviations for Levels of Balanced Reading Instruction, by Demographic Groups |</p>
<table>
<thead>
<tr>
<th>Mother's education</th>
<th>Balanced reading instruction</th>
<th>M</th>
<th>SD</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>203.97</td>
<td>27.42</td>
<td>527</td>
</tr>
<tr>
<td>Male</td>
<td>Moderate</td>
<td>212.97</td>
<td>34.31</td>
<td>643</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>212.94</td>
<td>40.24</td>
<td>282</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>209.68</td>
<td>33.35</td>
<td>1,452</td>
</tr>
<tr>
<td>Female</td>
<td>Low</td>
<td>221.81</td>
<td>32.65</td>
<td>471</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>216.47</td>
<td>36.51</td>
<td>476</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>226.66</td>
<td>42.72</td>
<td>511</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>221.77</td>
<td>37.88</td>
<td>1,458</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>212.39</td>
<td>31.28</td>
<td>998</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>214.46</td>
<td>35.29</td>
<td>1,119</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>221.75</td>
<td>42.35</td>
<td>791</td>
</tr>
<tr>
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<td>Total</td>
<td>215.74</td>
<td>36.29</td>
<td>2,910</td>
</tr>
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<td>Low</td>
<td>211.60</td>
<td>36.13</td>
<td>1,239</td>
</tr>
<tr>
<td>Male</td>
<td>Moderate</td>
<td>217.08</td>
<td>32.21</td>
<td>1,261</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>234.27</td>
<td>30.51</td>
<td>2,569</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>224.45</td>
<td>33.93</td>
<td>6,069</td>
</tr>
<tr>
<td>Female</td>
<td>Low</td>
<td>218.22</td>
<td>30.29</td>
<td>1,052</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>233.34</td>
<td>31.37</td>
<td>1,125</td>
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<td></td>
<td>High</td>
<td>234.77</td>
<td>29.76</td>
<td>2,026</td>
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<td>Total</td>
<td>230.25</td>
<td>31.12</td>
<td>4,203</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>214.64</td>
<td>33.73</td>
<td>2,291</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>224.75</td>
<td>32.83</td>
<td>2,386</td>
</tr>
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<td></td>
<td>High</td>
<td>234.49</td>
<td>30.18</td>
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</tr>
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<td></td>
<td>Total</td>
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<td>32.81</td>
<td>9,272</td>
</tr>
<tr>
<td>Total</td>
<td>Low</td>
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<td>33.94</td>
<td>1,766</td>
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<tr>
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<td>Moderate</td>
<td>215.69</td>
<td>32.98</td>
<td>1,904</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>232.15</td>
<td>32.24</td>
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</tr>
<tr>
<td></td>
<td>Total</td>
<td>221.16</td>
<td>34.40</td>
<td>6,521</td>
</tr>
<tr>
<td>Female</td>
<td>Low</td>
<td>219.33</td>
<td>31.07</td>
<td>1,523</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>228.32</td>
<td>33.86</td>
<td>1,671</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>233.14</td>
<td>32.94</td>
<td>2,537</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>228.06</td>
<td>33.20</td>
<td>5,661</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>213.96</td>
<td>33.02</td>
<td>3,289</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>221.46</td>
<td>33.97</td>
<td>3,585</td>
</tr>
<tr>
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<td>High</td>
<td>232.61</td>
<td>32.57</td>
<td>5,388</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>224.37</td>
<td>34.02</td>
<td>12,182</td>
</tr>
</tbody>
</table>

<p>| Table 4.—Engaged Reading Means and Standard Deviations for Levels of Opportunity to Read, by Demographic Groups |</p>
<table>
<thead>
<tr>
<th>Mother's education</th>
<th>Balanced reading instruction</th>
<th>M</th>
<th>SD</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>11.79</td>
<td>2.52</td>
<td>466</td>
</tr>
<tr>
<td>Male</td>
<td>Moderate</td>
<td>12.31</td>
<td>2.41</td>
<td>509</td>
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<tr>
<td></td>
<td>High</td>
<td>12.39</td>
<td>1.79</td>
<td>477</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>12.17</td>
<td>2.28</td>
<td>1,452</td>
</tr>
<tr>
<td>Female</td>
<td>Low</td>
<td>12.92</td>
<td>1.62</td>
<td>462</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>12.59</td>
<td>2.10</td>
<td>521</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>13.66</td>
<td>1.95</td>
<td>475</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>13.05</td>
<td>1.96</td>
<td>1,458</td>
</tr>
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<td></td>
<td>Low</td>
<td>12.36</td>
<td>2.19</td>
<td>928</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>12.45</td>
<td>2.26</td>
<td>1,050</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>13.02</td>
<td>1.98</td>
<td>952</td>
</tr>
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<td></td>
<td>Total</td>
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<td>2,910</td>
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<td>High</td>
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<td>Female</td>
<td>Low</td>
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<td>2.19</td>
<td>2,128</td>
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<td>Moderate</td>
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<td>1.71</td>
<td>1,258</td>
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<tr>
<td></td>
<td>High</td>
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<td>1.70</td>
<td>1,727</td>
</tr>
<tr>
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<td>Total</td>
<td>13.02</td>
<td>1.95</td>
<td>4,203</td>
</tr>
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<td></td>
<td>Low</td>
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<td>2.25</td>
<td>2,398</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>12.70</td>
<td>2.05</td>
<td>3,101</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>13.14</td>
<td>1.98</td>
<td>3,773</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>12.76</td>
<td>2.11</td>
<td>9,272</td>
</tr>
<tr>
<td>Total</td>
<td>Low</td>
<td>12.18</td>
<td>2.38</td>
<td>1,646</td>
</tr>
<tr>
<td>Male</td>
<td>Moderate</td>
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<td>2,352</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>12.73</td>
<td>2.09</td>
<td>2,523</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>12.46</td>
<td>2.23</td>
<td>6,521</td>
</tr>
<tr>
<td>Female</td>
<td>Low</td>
<td>12.36</td>
<td>2.08</td>
<td>1,680</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>12.99</td>
<td>1.85</td>
<td>1,779</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>13.36</td>
<td>1.76</td>
<td>2,202</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>13.02</td>
<td>1.95</td>
<td>5,661</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>12.27</td>
<td>3.02</td>
<td>3,289</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>12.64</td>
<td>3.07</td>
<td>3,505</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>13.12</td>
<td>3.57</td>
<td>5,388</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>224.37</td>
<td>34.02</td>
<td>12,182</td>
</tr>
</tbody>
</table>
shown in Figure 2b. Students with high mother’s education and high reading engagement had higher achievement than did students with moderate and low engagement. For students with low mother’s education, a moderate level of engaged reading was associated with high achievement. An intriguing finding in Figure 2b is that students whose mother’s education was low (high school or less) but who were at least moderately engaged readers showed significantly higher achievement than did students whose mother’s education was high but who were disengaged readers.

Gender differences are reported in Figure 2c. For both genders, high, moderate, and low groups in reading engagement showed high, moderate, and low levels of achievement, respectively. For ethnicity, the population was divided into two groups consisting of traditionally high achievers and traditionally low achievers. Caucasian and Asian students were in the first group; Hispanic, African American, Native North American, and Pacific Islanders were in the second group. For both ethnic groups, students with high, moderate, and low levels of engaged reading were associated with high, moderate, and low levels of reading achievement (see Figure 2d). To conclude, the association of engaged reading and achievement was positive across those demographic subgroups.

In the unconditional-within-group HLM, the estimates of random effects for the dependent variables were significant for engaged reading at the teacher level and for achievement at the school. For example, in Table 6, \(\tau_0 = .75\) for engaged reading at the teacher level showed that a significant amount of variance in classroom means remained to be explained, after accounting for gender. In addition, after accounting for mother’s education and engaged reading,

### Table 5.—Fully Unconditional Model for Partitioning Variance in Achievement

<table>
<thead>
<tr>
<th>Source of variance</th>
<th>Teacher level</th>
<th>School level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Achievement</td>
<td>Engaged reading</td>
</tr>
<tr>
<td>Between-group variability ((\tau))</td>
<td>460.56</td>
<td>.74</td>
</tr>
<tr>
<td>Within-group variability ((\sigma^2))</td>
<td>985.70</td>
<td>4.23</td>
</tr>
<tr>
<td>Reliability of intercept ((\lambda))</td>
<td>.38</td>
<td>.21</td>
</tr>
<tr>
<td>Intraclass correlation (ICC)</td>
<td>.32</td>
<td>.15</td>
</tr>
<tr>
<td>Adjusted ICC (^a)</td>
<td>.55</td>
<td>.45</td>
</tr>
</tbody>
</table>

\(^a\)The ICC was calculated using the formula \(\tau/(\tau + \sigma^2)\). \(^b\)The adjusted ICC was calculated using the formula \(\tau/\(\tau + \sigma^2 - \lambda\)\).

### Table 6.—Unconditional Within-Group HLM for Estimating Effects of Background on Achievement and Engaged Reading

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Teacher level</th>
<th>School level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Achievement</td>
<td>Engaged reading</td>
</tr>
<tr>
<td>Group mean (\beta_0)</td>
<td>223.15</td>
<td>12.69</td>
</tr>
<tr>
<td>Mother’s education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient (\beta_1)</td>
<td>7.66(^w)</td>
<td>6.78(^w)</td>
</tr>
<tr>
<td>Effect size</td>
<td>.36</td>
<td>.38</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient (\beta_2)</td>
<td></td>
<td>.57(^*)</td>
</tr>
<tr>
<td>Effect size</td>
<td></td>
<td>.66</td>
</tr>
<tr>
<td>Engaged reading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient (\beta_3)</td>
<td>4.14(^**)</td>
<td>3.62(^**)</td>
</tr>
<tr>
<td>Effect size</td>
<td>.19</td>
<td>.20</td>
</tr>
<tr>
<td>Random parameter</td>
<td></td>
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<tr>
<td>Independent variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\tau)</td>
<td>308.87</td>
<td>.75(^**)</td>
</tr>
<tr>
<td>(\sigma^2)</td>
<td>893.17</td>
<td>3.72</td>
</tr>
</tbody>
</table>

Note. Effect sizes were computed by dividing each beta coefficient by the pooled within-group standard deviation, which was the square root of \(\sigma^2\) in the fully unconditional model. HLM = hierarchical linear modeling. \(ns\) = nonsignificant.

\(^*p < .01\), \(^**p < .001\).
significant variance in achievement between schools remained to be explained.

The first guiding question for the study addressed the extent to which engaged reading predicted reading achievement. The within-group model at the teacher level in Table 6 shows that engaged reading had a significant beta coefficient ($\beta$) of 4.14 ($p < .001$) with an ES of .19. In the analysis, the ES for mother's education was .36. After the contribution of mother's education was accounted for, engaged reading significantly predicted achievement. At the school level, a similar ES of .20 ($p < .001$) was found for engaged reading on achievement after mother’s education was controlled. As engaged reading increased one standard deviation, reading achievement increased about .20 standard deviation for all students, irrespective of their parents' education.

**Conditional Between-Group HLM**

The second guiding question of the study asked whether opportunity to read was associated with engaged reading and achievement. As indicated in Table 7, when the teacher was the unit of between-group analysis on engaged reading, opportunity to read had a significant gamma coefficient of .17, with an ES of .20 ($p < .001$). In the model, gender was included as a predictor variable, indicating that opportunity to read influenced engaged reading when gender effects were accounted for. The results indicate that balanced reading instruction had a gamma coefficient of $-.02$, with an effect size of .02, which was not statistically significant.

Regarding between-school effects on engaged reading, the model contained gender as a within-group variable, and
opportunity to read as a between-group variable, which had a gamma coefficient of .18, with an ES of .38 ($p < .001$). An increase of one standard deviation in opportunity to read was associated with an increase of about .4 standard deviations in engaged reading when the contribution of gender to variance in engaged reading was accounted for. In that model, balanced reading instruction had a gamma coefficient that was not statistically significant.

Teachers who provided students with more opportunity to read in the classroom and encouraged wide reading had significantly more highly engaged readers (see Figure 3a). Furthermore, opportunity to read increased amount of engaged reading for a large majority of the demographic subgroups. For example, in Figure 3b, students with high levels of mother’s education who received high opportunity to read were the most engaged readers. Students with moderate levels of opportunity to read were slightly lower, and students with the lowest level of opportunity to read were the lowest in engagement. Among students who had mothers with low education, the high, moderate, and low levels of opportunity to read were associated with high, moderate, and low levels of engagement. Also, for students having mothers with low education, the high opportunity to read produced a level of reading engagement comparable to students who had mothers with a high level of education and were given relatively high opportunities to read.

For gender groups, high, moderate, and low opportunities to read were associated with high, moderate, and low engagement for both girls and boys (see Figure 3c). For the ethnic groups, high, moderate, and low levels of opportunity to read were associated with high, moderate, and low engagement levels for the White and Asian group. For the other ethnic group that included minority students, moderate and high levels of opportunity to read produced higher student reading engagement than did low opportunity to read. Furthermore, for minority students, a high level of opportunity to read produced a reading engagement level that exceeded the engagement level of the White and Asian group give moderate opportunity to read (see Figure 3d).

The third question was whether balanced reading instruction would increase reading achievement. We conducted HLM using within-group predictors of mother’s education, gender, and engaged reading. The between-group variables were balanced reading instruction and opportunity to read. Those variables are reported in Table 7. For the between-teacher analysis, balanced reading instruction had a significant $\gamma$ coefficient of 2.29 and an ES of .13 ($p < .01$). An increase of one standard deviation in balanced reading instruction can be expected to produce an increase of about .13 standard deviations in reading achievement. Although that ES is relatively low according to standard criteria (Hedges & Olkin, 1985), the effects were obtained when

| Table 7.—Conditional Model of Effects of Instructional Variables on Reading Achievement and Engaged Reading |
|-------------------------------------------------|-----------|-----------|-----------|-----------|
| Independent variable                           | Teacher level | School level |          |          |
|                                                | Achievement | Engaged reading | Achievement | Engaged reading |
| Group mean $\beta_0$                           | 223.28      | 12.72      | 222.22     | 12.73      |
| Balanced instruction                           |             |            |            |            |
| Coefficient $\gamma_1$                        | 2.29**      | ns         | ns         | ns         |
| Effect size                                    | .13         |            |            |            |
| Opportunity to read                            |             |            |            |            |
| Coefficient $\gamma_2$                        | ns          | .17***     | ns         | .18***     |
| Effect size                                    | .20         |            | .38        |            |
| Mother’s education                             |             |            |            |            |
| Coefficient $\beta_1$                         | 6.35**      |            | 6.77**     |            |
| Sex                                            |             | .50**      |            | .50**      |
| Engaged reading                                |             |            |            |            |
| Coefficient $\beta_2$                         | 3.80***     |            | 3.51***    |            |
| Random parameter                               |             |            |            |            |
| Variance components                            |             |            |            |            |
| Group means ($\gamma$)                         | 309.15      | .62        | 218.70     | .11        |
| Within-group variance ($\sigma^2$)             | 860.43      | 3.67       | 978.09     | 4.52       |
| Total explained variance                       | .35         | .16        | .32        | .06        |

*Note. Effect sizes were computed by dividing each beta coefficient by the pooled within-group standard deviation. This value was computed by taking the square root of $\sigma^2$ of school means in the conditional within-group hierarchical linear model. ns = nonsignificant.*

**$p < .01$, ***$p < .001$.**
effects of mother’s education and engaged reading were accounted for, which is a stringent test. Table 7 shows, further, that opportunity to read had a gamma coefficient that was not statistically significant.

The HLM for achievement was also conducted with school as the between-group unit of analysis as shown in Table 7. In that model, mother’s education and engaged reading were with-group variables. Balanced reading instruction had a \( \gamma \) coefficient of 1.91, with an ES of .06 that was not statistically significant. In addition, opportunity to read had a gamma coefficient that was not statistically significant.

Balanced reading instruction contributed to reading achievement in the teacher-level analysis. Students who received a higher emphasis on balanced reading instruction were relatively higher achievers than students who received less balanced instruction (see Figure 4a). Contributions of balanced reading instruction to achievement occurred regularly across most demographic subgroups. Figure 4b shows that for students with high mother’s education, those with more balanced reading instruction were higher achievers than those with moderate instruction, who were higher achievers than those with low amounts of balanced reading instruction. For students with low mother’s education, those with high balanced reading instruction exceeded those with a moderate or low amount of balanced reading instruction. In addition, students with low mother’s education and the
highest levels of balanced reading instruction were higher in achievement than were students with high mother’s education and a low level of balanced reading instruction.

For girls and boys, high, moderate, and low levels of balanced reading instruction produced higher, more moderate, and lower levels of achievement (see Figure 4c). For the ethnic groups, higher amounts of balanced reading instruction produced higher achievement than did moderate amounts of balanced reading instruction, which were comparable in achievement to those with lower amounts of instruction for both demographic groups (see Figure 4d).

The fourth question addressed the distribution of engaged reading, opportunity to read, and balanced reading instruc-
tion in Maryland. As shown in Figure 5a, the distribution is skewed to the left, indicating that some students were highly disengaged (e.g., those with scores below 11). Those students were the nonreaders, who were also the lowest achievers. Other students appeared moderately engaged (12, 13) and about one third were highly engaged (14 and above). Opportunity to read also showed a skewness to the left, with a substantial percentage of teachers providing low opportunity to read (Figure 5b). Balanced reading instruction was more normally distributed, with a relatively high proportion in the center (Figure 5c).

To conclude the results, this study was the first investigation to show that classroom reading instruction explains
were higher achievers than were disengaged readers from high socioeconomic backgrounds. That conclusion suggests that reading programs fostering high amounts of engaged reading can overcome traditionally formidable barriers to reading achievement, such as poverty, which is associated with income. In Figure 1, those findings are depicted by the paths from gender, mothers’ education, and engaged reading to reading achievement.

Because students’ amount of engaged reading predicted achievement, we wanted to determine whether instruction could influence students’ amount of engaged reading. Our first finding was that when teachers provided extensive opportunity to read, students’ amount of engaged reading increased. Benefits occurred, furthermore, for all demographic groups. Conceptually, we observed that there is a small chain with three links. The first link is the amount of opportunity to read in the classroom. The second link is when that opportunity is high, students’ amount of engaged reading increases. The third link is when students’ amount of engaged reading increases, their achievement increases. That finding suggests that deeper understanding of the key features of high-quality opportunity to read in the classroom will yield dividends in increased reading accomplishment.

Reading achievement on the Maryland NAEP also was increased by the amount of balanced reading instruction in classrooms. Classrooms with high levels of balance showed higher reading achievement than did classrooms with low levels of balance. That contribution was observed even after students’ demographic background factors and their amount of engaged reading were statistically controlled. However, the amount of balanced reading instruction did not increase the amount of engaged reading. Therefore, it appears that teachers and schools would be well advised to provide both a high level of balanced reading instruction and a high level of opportunity to read. It is probable that only providing one of those features will not be as productive for achievement as providing both aspects of a comprehensive reading program.

Discussion

Many obstacles prevent the swift and accurate use of research in the education policy arena (Allington & Woodside-Jiron, 1999). We suggest, however, that the process of informing policy decisions with research can be successful when several ingredients are present. First, the decisions must be politically initiated. The question asked in the research must be a question posed and expressed by policy makers who may include legislators and national, state, or district administrators. Questions or issues that researchers believe are important often represent recent advances in the research field (Pearson, 1996). If the questions or issues are not priorities for policy makers, however, then the research addressing them has a very small policy audience.

With a politically motivated question identified, research addressing it may be used by policy makers if it is viewed as relevant and if it possesses several characteristics. In the
recent 5-year period, one of those characteristics is the scientific and quantitative nature of the investigations. Policy studies in journals such as the American Educational Research Association periodical, *Education Evaluation and Policy Analysis*, or the American Psychological Association periodical, *American Psychologist*, are nearly always in the scientific tradition. One reason for the quantitative emphasis in policy studies is “generalizability.” If an administrator is forming an action plan for teaching, testing, or professional development, she will seek data showing the plan is likely to work (e.g., to have intended benefits) for the full population of interest. A local action plan that is effective within a niche is not highly attractive. The studies of priority, then, document the generalizability of their findings. Such studies that are arguable applicable to a population have a well-formed sample of the population. For example, in the NAEP, efforts are made to sample the national and state populations accurately, with the result that the data tend to be trusted by policy makers. In Maryland, the MSPAP is a statewide assessment given to each student; data from the test are therefore valued by administrators.

A second condition of useful policy research is that it represents a body of relevant data. Findings must be on-target, directly and convincingly answering a question or an issue. Because the quality of evidence is highly debatable in scholarly communities, one study is rarely conclusive. Consequently, policy makers desire converging evidence from several investigations by different authors, with different samples of the population.

In this study, the policy question was formed by the Maryland Superintendent of Schools. In 1997, she charged a reading task force to “clarify and assess the status of reading in Maryland (K–12) through analyzing available data and by studying models of successful reading programs” (Richardson, 1998). In its work, the task force examined the reading achievement trends from 1993–1997 on the Maryland state assessment and reviewed existing research to identify successful reading programs.

The task force identified opportunity to read and balanced reading instruction as two characteristics of “successful reading programs.” The task force further recommended that on the basis of research literature, engaged reading should be emphasized in reading programs. The present study examined these variables with NAEP data for Grade 4 students throughout Maryland.

We found that amount of engaged reading predicted reading achievement on the NAEP. Students who read independently for enjoyment, take books from libraries, and read for substantial amounts of time are relatively higher in achievement. That finding, which was observed on a Maryland state sample, confirms previous studies with local samples (Anderson et al., 1988; Cunningham & Stanovich, 1997; Guthrie, Anderson et al., 1999). The policy significance of this finding is that amount of engaged reading is a student characteristic predictive of achievement that can be influenced by teachers. Amount of engaged reading is a visible policy indicator because it is a student characteristic that is predictive of achievement and modifiable. Therefore, amount of engaged reading merits close inspection. We need to describe its elements, identify its predictors, and determine how to increase it in classrooms and schools.

Amount of engaged reading has additional policy relevance because it is sufficiently powerful to mitigate other background variables, such as educational background. A highly engaged reader with low parental education is likely to achieve higher on the NAEP than a less engaged reader with higher parental education. That finding suggests that if students become highly engaged readers, they can overcome a major obstacle to reading achievement.

The theoretical explanation of the effect of the amount of engaged reading on achievement is based on both cognitive and motivational factors. Expertise in reading as measured on the NAEP requires several important cognitive competencies. Those cognitive processes include representing the surface meaning of the text, linking new meanings to background knowledge, constructing inferences to build a broader interpretation, self-monitoring to assure full understanding, and integrating concepts across multiple texts. When students select books and spend time reading, they gain those aspects of comprehension. The cognitive processes are strengthened when they are frequently activated, and they are useful to the students for understanding texts of interest (Guthrie, Wigfield et al., 1999).

Amount of engaged reading also is determined by student motivation. Longitudinal data on motivation and amount of engaged reading showed that changes in intrinsic motivation were followed by changes in amount of engaged reading, but not vice versa. As students became more intrinsically motivated over time, their engaged reading increased (Wigfield & Guthrie, 1997). In several widely recognized models of engagement in school, student motivation increased achievement through engagement (Pintrich & Schrauben, 1992; Skinner et al., 1990). As motivation increases, amount of academic engagement expands, which increases achievement in the form of test scores or grades.

Because amount of engaged reading is associated with achievement, one should identify instructional or schooling variables that influence engaged reading. We found that engaged reading is fostered by opportunity to read. When teachers provided time for silent reading and arranged for frequent library trips, they generated reading opportunities. Students also benefited from autonomy in some of their reading. High expectations for independent reading and writing often further increased the amount of engaged reading.

Opportunity to read did not increase achievement directly, however. Students who did not respond to the opportunity by becoming more engaged did not show increases in achievement. The effect of opportunity to read on achievement was mediated by engaged reading, meaning that engagement was the link between the instructional practice of providing reading opportunity and measured achievement in reading.
The contributions of opportunity to read for reading achievement have been shown in several classroom studies (Goatley et al., 1995; Morrow, 1996). The present findings suggest that the effects observed in those investigations were mediated through engaged reading. Although engagement was not measured in those investigations, we expect that opportunity to read increased engagement, which, in turn, increased reading achievement. This model of how opportunity to read increases achievement is consistent with previous classroom studies at the elementary level (Guthrie et al., 1998).

We found a second instructional path to achievement in reading on the NAEP at Grade 4, which was balanced reading instruction. When teachers (a) requested students to write about their reading and assessed their understanding of individual paragraphs, (b) expected students to explain what they had comprehended in small groups, or (c) provided cognitive coaching, achievement was relatively high. In other words, learning to comprehend occurs partly in teacher-directed, instruction-specific cognitive skills.

Our findings extend the previous empirical literature in several respects. The effects of balanced reading instruction on reading achievement in the later elementary grades (4–6) have been observed empirically with a variety of research methods (Pearson & Fielding, 1991; Pressley, 1998). Specifically, the findings can be related to a study of 545 teachers in 33 schools in three Maryland districts (Guthrie, Schafer, Von Secker, & Albarn, 2000). Changes in achievement across 2 years on the MSPAP were predicted by two characteristics of the classroom instruction, as reported by teachers on a questionnaire. First, the “abundance and diversity of books and resources” used in instruction was a strong predictor. Examples of items in that predictor were: “We select books for the school that are recommended by others,” and “Our media specialist collaborates with us on the development of literature-based units.” That construct was highly related to the opportunity-to-read construct of the present study.

The second predictor in the prior study was integrated instruction. That predictor included “reading long, challenging texts,” “teaching language arts while teaching science and social studies,” “teaching note taking,” “doing research alone or in small groups,” “reading expository texts,” and “learning about the writing process.” In the present study, balanced reading instruction consisted of items that tapped “writing about reading,” “using trade books with basal races,” “group activities or projects about topics in reading,” and “writing paragraph-length responses about text.”

The present findings showing the benefits of opportunity to read and balanced reading instruction are consistent with previous research on concept-oriented reading instruction (CORI), which has been found to increase reading comprehension, conceptual knowledge, and problem solving in science, and motivation for reading (Guthrie et al., 1996; Guthrie et al., 1998; Guthrie et al., in press; Guthrie, Anderson et al., 1999). Central to CORI are high levels of opportunity to read and balanced reading instruction as defined in this article. The present findings suggest that two of the multiple dimensions of CORI are beneficial to reading achievement in a large statewide sample. Furthermore, we found that a major outcome of CORI, engaged reading, is highly associated with reading achievement for all demographic groups. Consequently, CORI is one example of an instructional intervention that is allied to the policy-relevant findings in this study.

Several limitations of this study should be noted. First, the variables of engaged reading, balanced reading instruction, and opportunity to read were indicators of the true constructs. Those classroom practices and engaged reading activities are highly intricate and complex (Guthrie & Alao, 1997). A few items on a questionnaire cannot represent those important, myriad processes completely, although the items are correlated with them. Second, reliabilities of the NAEP achievement measure cannot be directly estimated due to the use of plausible values in this assessment; the HLM-estimated reliability shows it was a relatively imprecise indicator of achievement differences between classrooms and schools. The reliabilities of the predictors were moderate because administrative conditions vary, and students’ and teachers’ motivation to accurately complete the questionnaires were inconsistent. Third, there were necessarily unmeasured variables that might have entered the models represented in Figure 1. For example, the amount of direct phonics and word recognition instruction was not measured, and its effects are unknown for these data. Fourth, there were significant effects for balanced-reading instruction on achievement for the between-teacher analysis but not for the between-school analysis. However, the effect of engaged reading and opportunity to read were constant across types of analysis.

There are at least four policy implications from our findings. First, engaged reading can be viewed as a valued outcome of instructional activity. Whereas reading achievement is the criterion for most policy makers, achievement was significantly predicted by engaged reading. Furthermore, teachers, media specialists, or principals can observe engaged readers choosing books, reading silently, reading for enjoyment, and taking books from the library. Therefore, engagement in reading can serve as a proxy or a promise for achievement. Classrooms and schools should invest time and resources toward increasing reading engagement.

Second, opportunity to read is a significant contributor to reading achievement that should be implemented in classrooms and schools. Opportunity to read refers to teachers’ using a variety of books for reading instruction, encouraging student discussion of texts, affording students’ choice of books, expecting sustained silent reading, and providing access to library collections in the classroom and school. In other words, the opportunity to read is integrated within a systematic reading program. Opportunity to read in this
study does not refer to isolated activities such as DEAR (Drop Everything and Read) time. Teachers who afford students opportunity to read build a context for engaged reading, which increases achievement.

Third, the contribution of balanced reading instruction to achievement in reading was evident for all demographic subgroups. Even for traditionally low-achieving students, such as those with low levels of mother's education or minority students, higher emphasis on balanced instruction was associated with higher achievement. Their achievement was increased by using trade books in the classroom, asking students to write extensively about their reading, emphasizing writing in connection with reading, and organizing projects for individuals and groups. The policy suggestion is that these activities should be as prominent in Grade 4 for traditionally lower achieving students as for traditionally higher achieving students.

Fourth, increased support should be given to teachers within the school. Differences in student reading engagement and reading achievement were more attributable to teachers than to schools. Consequently, professional development of teachers should be viewed as a most promising agent of change for reading achievement.

NOTES

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