DEBRA M. KAMPS, HOWARD P. WILLS, CHARLES R. GREENWOOD, STEPHANIE THORNE, JUNELYN F. LAZO, JENNIFER L. CROCKETT, JUDY MCGONIGLE AKERS, and BRENDA L. SWAGGART

Curriculum Influences on Growth in Early Reading Fluency for Students With Academic and Behavioral Risks: A Descriptive Study

This study applied an early screening approach to determine the risk status of children in 5 urban schools and monitor their patterns of reading growth over 3 years. A majority of students were from culturally diverse and low-SES backgrounds. Two validated instruments were used for determining (a) academic risk (the Dynamic Indicators of Basic Early Literacy Skills [DIBELS]; Good, Simmons, & Smith, 1998) and (b) behavioral risk (Systematic Screening for Behavior Disorders [SSBD]; Walker & Severson, 1992, or Early Screening Project; Walker, Severson, & Feil, 1995). DIBELS data for 383 students were used to determine the characteristics and effectiveness of reading curriculum reforms for students in kindergarten through 2nd grade. Results indicated that students with a single risk factor (academic or behavioral) progressed more slowly than the general population in the participating schools. The students with behavioral risks, however, made better progress, becoming more fluent readers than the students with academic risks. Students with both academic and behavioral risks made the least progress. *The Reading Mastery* curriculum (Reading Mastery, 1995) produced better growth in reading fluency than did *Success for All* (Success for All, 1999) or the literature-based curriculum. It also produced better growth for students with academic, behavioral, or both risk factors. The *Success for All* curriculum produced less growth compared to the *Reading Mastery* curriculum but was superior to the literature-based curriculum. Implications are discussed.

Educators as a community are facing (a) an alarming acceleration in the occurrence of disruptive and challenging behaviors that seriously impede instruction and student learning and (b) a rapidly increasing percentage of students who have failed to acquire competent levels of reading ability. Unfortunately, many of these students have both problems (Glassberg, Hooper, & Mattison, 1989). School-ready behaviors include following directions, sustaining attention, participating in groups, having processing abilities, and showing motivation, all of which are absolutely necessary for young children to remain actively engaged when they are first learning to read. Conversely, behavioral problems such as anxiety, disruption, noncompliance, and attention deficits are counterproductive to learning. Serious behaviors such as aggression, argumentativeness, and defiance are even more of a threat to learning, yet common in high-risk schools. Behaviors, both positive and negative, affect student outcomes at the individual,

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classroom, and school level. Unfortunately, few studies have explored the link between reading and behavior problems (e.g., Frick et al., 1991; Glassberg et al., 1989). Yet, there is compelling evidence of a strong relationship. From a societal perspective, approximately 75% of individuals in prison are poor readers. From a school perspective (reported in Chard & Kame'enui, 2000), children who displayed poor reading skills in first grade had a 90% chance of continuing to have poor reading skills 3 years later. Juel (1988) reported that such students begin to actively dislike reading and actually read less both in and out of school. Continuing over their school years, students showing reading problems at the end of third grade are not likely to improve significantly by the end of eighth grade (Felton & Wood, 1992, cited in Chard & Kame'enui, 2000). Similarly, children exhibiting ongoing, serious disruptive behavior patterns well into third grade are increasingly considered chronic offenders in need of tertiary (i.e., intensive, ongoing) intervention, similar to medical treatment regimes prescribed for health disorders (Kazdin, Mazurick, & Bass, 1993).

In an early review of 25 studies on the academic achievement of students with emotional and behavioral disorders (EBD), Mastropieri, Scruggs, Bakken, and Whedon (1996) reported that students with both academic and behavior problems demonstrated reading achievement that was lower than expected, based on their assessed intellectual levels. Current reports have indicated that having both problems also is a stable condition, with 50% of students with EBD meeting one or more of the criteria for learning disabilities (LD; Glassberg et al., 1989). Others consistently report the comorbidity of learning and behavioral problems with attention-deficit/hyperactivity disorder (ADHD), a condition manifested by high levels of behaviors that interfere with learning, including impulsivity, distractibility, inattention, and moodiness (Torgesen et al., 2001).

In addition to the relationship between EBD and LD, it is well recognized that children with disabilities exhibit learning and behavioral problems at an early age. Longitudinal studies have shown that serious antisocial behaviors may emerge as early as 4 years of age (Campbell, 1995; Kamps, Ellis, Mancina, & Greene, 1995; Patterson, Reid, & Dishion, 1992) and that early on, many of these students who are served within typical general education classrooms experience limited or delayed academic progress. It has also been confirmed that disabilities are often formally identified late in the middle-elementary years, with precious time for early intervention having been wasted. Finally, it is recognized that caregiving and educational environments can either be supportive of children's academic and social development or contribute to further delays and deficits (Kamps, Ellis, Mancina, Wyble, et al., 1995). Thus, an important recent development has been the advent and use of early screening tools.

Three specific examples of psychometrically sound instruments are, for literacy skills, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good et al., 1998) and, for behavioral problems, the Systematic Screening for Behavior Disorders (SSBD; Walker & Severson, 1992) and the Early Screening Project (ESP; Walker et al., 1995). The DIBELS is designed to measure performance on early literacy skills before children begin to read. Thus, DIBELS can (a) identify children who are not acquiring prereading skills (i.e., letter naming, initial sounds fluency, blending sounds in nonsense words) and (b) monitor progress due to reading interventions/curriculum. The SSBD is designed to screen children with early behavior problems using a sequence of teacher nominations, ratings, and direct observation techniques. Much like the DIBELS monitors academic progress, the SSBD and ESP use observation procedures to monitor individual progress in reducing behavior problems. The availability of these instruments suggests that a proactive

model of early screening and prevention of reading and behavior failure is possible. If we wait until students are in the third grade to identify them with behavioral or learning disabilities, we miss the critical window of opportunity for effective early intervention for students at risk.

Once screened, an important area of concern from a prevention standpoint is the effectiveness of early instruction in primary-level curriculum and its efficacy for young students with behavioral and/or learning problems. This is a particularly important question in high-risk urban schools that serve large numbers of vulnerable students and have failed to meet the national goals of helping all children become successful readers by the end of third grade (Neuman & Celano, 2001, as cited in Agramonte & Belfiore, 2002; National Reading Panel, 2000). In a recent review of early literacy research, Al Otaiba and Fuchs (2002) summarized recommendations from several sources (i.e., Coyne, Kame'enui, & Simmons, 2001; McMaster, Fuchs, Fuchs, & Compton, 2002; O'Connor, 2000) for a three-phased system designed to intensify instruction to meet the needs of students with increasing academic needs. In Phase 1, or primary intervention, the most effective instructional programs are implemented by general educators, with the expectation that this will "accelerate the learning of most children" (i.e., reduce the number of children with behavioral and learning problems; p. 313). Phase 1 intervention includes best practices in reading instruction (e.g., phonemic awareness, systematic phonics, vocabulary and comprehension, fluency building), as recommended by the research synthesis in the National Reading Panel's (2000) report. In Phase 2, a secondary intervention (e.g., strategic small-group instruction in deficit areas) is implemented for students who are unresponsive to the primary-level instruction. In Phase 3, a tertiary, intensive intervention is implemented (e.g., pullout instruction using a phonics-driven curriculum with multiple practice opportunities, systematic feedback, progress monitoring). The success of a three-phase model like this clearly depends on the use of sensitive early measurement strategies like DIBELS and SSBD to provide data that can be used for making instructional intervention decisions relevant to the three phases of instruction. This three-phase model is compelling because typical general and special education services in elementary school settings lack a cohesive process for ensuring early access to the most successful reading and behavioral interventions for all children in kindergarten through third grade.

The current research monitored growth longitudinally over a 3-year period in the emerging reading performance of students in kindergarten through second grade as it related to behavioral and academic risks and the use of three different reading curricula. An early, schoolwide, screening approach using DIBELS and SSBD was established in five urban schools undergoing curriculum reforms. Specific research questions included the following:

1. What was the proportion of students determined to be at risk using SSBD and DIBELS (Letter Naming and Nonsense Word Fluency) measures in kindergarten and first grade?

2. How strong were the DIBELS subscales of Letter Naming, Nonsense Word Fluency, and Oral Reading Fluency, measured at similar times, linked, thus providing evidence of a common trajectory of reading progress?

3. What was the pattern of growth in students' letter naming skills, nonsense word fluency, and oral reading fluency, and how was it differentially affected by differences in reading curricula (i.e., literature-based, *Success for All*, and *Reading Mastery*)?

4. How was the pattern of growth in students' oral reading fluency influenced by academic and behavioral risks?

5. How was the pattern of growth in students' oral reading fluency influenced by both risk and differences in curriculum?

Method

School Settings

Schools located in urban settings in a large Midwestern city participated in the study. Eight schools were requested to participate, based on the following procedures:

1. We asked a district administrator to identify schools with high numbers of students at risk for behavioral and emotional disorders.

2. We contacted building principals regarding the project goals.

3. We presented the project goals to teachers and asked them to participate.

The project was described to administrators and teachers as an early intervention effort with the following objectives:

1. to provide early screening for academic and behavioral risks,

2. to provide early intervention for children meeting screening criteria using district reading initiatives, and

3. to monitor student progress over a 2- to 3-year period.

Subsequently, five of the eight schools agreed to participate in the study. In addition to having high numbers of students with behavior problems, all five schools were considered "at risk" because of the presence of one or more of the following: moderate to high numbers of students from families of low socioeconomic status (76%, 72%, 95%, 53%, and 78% in Schools 1–5, respectively), high numbers of students from minority groups (89%, 61%, 95%, 21%, 65%, respectively), and/or a history of poor student academic performance, based on district or state assessments. In each school there were 1 to 2 kindergarten teachers, 2 to 4 first-grade teachers, and 2 to 3 second-grade teachers. Forty-five to 47 teachers participated each year.

Participants

Student population sizes were 291, 151, 262, 574, and 312, in Schools 1 through 5, respectively. Of the approximately 730 students in kindergarten through second grade, 383 students, whose parents signed consent forms, participated, representing 52% of the K–2 classes (44%, 30%, 81%, 46%, and 58%, in Schools 1–5, respectively). Of these 383 students, 213 were boys and 170 were girls; 154 (40%) were African American, 130 (34%) European American, 30 (8%) Hispanic, 25 (7%) African immigrants (Somolian and Sudanese), 26 (7%) Asian, and 18 (5%) were missing information. One hundred and forty-six students (n = 16, 11, 42, 37, 40, across Schools 1–5, respectively) participated as "typical peers" (i.e., did not meet screening criteria for behavioral or academic problems, 38% of the sample), whereas 237 students (62% of the sample) were determined to be at risk. Forty (10%; n = 4, 1, 19, 9, 7, respectively) were determined to be at risk for behavioral problems, based on the screening procedures described in the following section. A total of 137 (36%; n = 25, 13, 28, 41, 30, respectively) exhibited academic delays, and 60 (16%; n = 11, 1, 22, 20, 6, respectively) were determined to have both behavioral and academic problems.

Early Screening Procedures

All students in kindergarten through second grade were screened for behavioral and academic risk using multiple-gating measurement procedures (Walker & Severson, 1992; Walker et al., 1995). Screening and identification of students occurred in January of the 1st study year and was repeated in late September or early October of each subsequent school year.

The following procedures describe these processes.

Behavior Problem Risk. Screening for risk of behavior problems followed a modified version of the ESP, for kindergarten, and the SSBD, for first and second grades, and included teacher nominations, teacher ratings, and classroom observations of behavior. The first step required teachers to review complete class rosters and nominate all students who exhibited externalizing or internalizing behavior. Teachers then completed the ESP or SSBD behavioral checklists, including the Critical Events, Maladaptive, and Adaptive scales for nominated students. Kindergarten students whose raw scores were 1 or more on the Critical Events Index, 20 or more on the Maladaptive Behavior Index Rating, or 21 or less on the Adaptive Behavior Index of the ESP checklist were considered at risk for behavioral problems. First and second graders whose scores were 1 or more on the Critical Events Index, 35 or more on the Maladaptive Behavior Index, or 30 or less on the Adaptive Scale of the checklist were considered at risk. In addition, nominated students (4 of the 40) who did not meet one of the cutoff scores were included as being at risk if two or more classroom observations indicated that he or she had low levels of on-task behavior (< 70%) and higher-than-average frequencies (> 10 per hour) of disruptive classroom behaviors (i.e., out-of-seat behaviors, aggressive threats or behaviors toward peers, negative verbalizations to peers or adults, and noncompliance to classroom rules).

Academic Risk. Based on a listing of reading and math skills, a nomination procedure was developed for grade-level expectations of academic performance. The academic skills list was developed by the researchers with input and confirmation from collaborating experienced classroom teachers (i.e., three to four teachers per grade level). Teachers reviewed class rosters using the academic skills list and nominated any students they believed to be at risk for academic problems (i.e., not meeting grade-level expectations). Screening for academic risk was conducted during the same session as screening for behavioral risk. For all participants in the sample, including those nominated by teachers during the screening process, confirmation of academic risk was provided by reviewing initial DIBELS scores for the sample on a post hoc basis (at the end of the project period). For kindergarten students enrolled in the project, a score of less than 22 letters per minute on the Letter Naming subtest during the winter assessment confirmed academic risk (less than the 30th percentile). For first-grade students, a score of less than 31 letters per minute on the Letter Naming subtest during the fall assessment confirmed academic risk (less than the 30th percentile). For second-grade students, a score of less than 40 on the Nonsense Word Fluency subtest during the fall assessment indicated academic risk (50 on the winter first-grade assessment is indicative of a benchmark performance; Kaminski & Good, 1996).

Design

A longitudinal grade-cohort design was used for 3 years of the study. At the start of the study, Cohort 1 students (n = 237) were in kindergarten or first or second grade and were followed for the next 2 to 3 years (n = 31, 14, 80, 58, and 54 students, across the five schools, respectively). Cohort 2 students (n = 146), also in kindergarten or first or second grade, began the study 1 year later and were followed for 2 years (n = 25, 12, 31, 49, and 29 students, respectively). Students in the study were assessed twice in Year 1, four times in Year 2, and three times in Year 3. Assessments occurred at 2-month intervals during each school year for a total of 16 possible occasions, from kindergarten through third grade. In all, 2,615 assessments were collected. Because students were differentially enrolled in the study by grade and cohort, the actual number of assessments for any one student varied from

three to nine. The median number of assessments was six per student.

Measures

The DIBELS subtests used in this study, Letter Naming, Nonsense Word Fluency, and Oral Reading Fluency, were administered to students according to their grade level (see Table 1). The DIBELS subtests follow a curriculum-based assessment model in that students rapidly recite letter names or blend sounds in nonsense words or read aloud during 1-min timings. Rate per minute is indicative of fluency or risk for falling behind. These assessments are designed for teachers to use as a quick indicator of student progress acquiring normative expectations in early literacy skills, with subsequent measures in correct words per minute reflecting progress learning to read (see http://dibels.uoregon. edu/). Letter Naming was selected rather than other early skills subtests (i.e., Initial Sound Fluency, Phonemic Segmentation) because prior research has established a link between rapid naming of letters and numbers and development of later reading skills. Data collection occurred for Letter Naming on Occasions 1 through 5 and 8, for Nonsense Word Fluency on Occasions 5 through 11, and for Oral Reading Fluency on Occasions 5 through 16. This resulted in 797 Letter Naming data points, 1,397 Nonsense Word Fluency, and 1,869 Oral Reading Fluency data points.

District-Initiated Reading Curriculum

The schools participating in the study selected their reading curriculum independently of the researchers. Three of the schools (i.e., 1, 2, and 4) had determined with district support that past student performance indicated a need for major improvement and reform in order to prevent and reduce further academic failures. Schools 1 and 2 were engaged in the 2nd year of a literature-based, guided reading program reform. School 3, a charter school, was in its 1st year of existence and used the *Reading Mastery* curriculum (Reading Mastery, 1995). School 4 was in its 1st year of *Success for All* (Success for All, 1999). School 5 was not engaged in any new initiative but used a literature-based program, with school-based enhancements added to improve performance. Thus, at the start of the study, Schools 3 and 4 were in the 1st year of new reading interventions.

Materials in the literature-based reading programs included the following collections: Scholastic publishes readers as part of the guided reading program (Schools 1 and 2); and Macmillan/McGraw-Hill publishes spotlight on literacy materials (School 5). These selections were based on district reading initiatives and school improvement plans. Schools 1 and 2 received district-level inservice on an annual basis, and literacy coaches were available in each building to assist with instruction and monitoring of student performance. Enhancements to reading in School 2 included small-group instruction (4–8 students) on a fairly consistent basis and occasional tutoring from adult volunteers. School 5 had received prior training using spotlight on literacy materials; however, no follow-up training or ongoing monitoring of students' performance was implemented outside of teacher-determined assessments and referral procedures. Enhancements to spotlight on literacy materials included implementing peer-tutoring sessions to practice oral reading fluency (implemented by some but not all teachers) and using *Reading Mastery* scripted lessons to provide phonics instruction to a small number of children. However, in this program, independent practice in student workbooks was not incorporated.

School 4 used the *Success for All* reading intervention, beginning in Year 1 of the descriptive study. Teachers received standardized workshop training and access to instructional coaches, who were available in the building to assist teachers; students were monitored on a consistent basis for performance using *Success for All* guidelines; and on-site consultation was

Table 1

DIBELS Assessment Schedule by Grade and Subtest

	Occasion															
Grade/DIBELS subtest	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Kindergarten																
Oral Reading Fluency																
Nonsense Word Fluency																
Letter Naming	x	x	x	x	x			x								
Grade 1																
Oral Reading Fluency					x	x	x	x								
Nonsense Word Fluency					x	x	x	x								
Letter Naming					x			x								
Grade 2																
Oral Reading Fluency									x	x	x	x				
Nonsense Word Fluency									x	x	x	x				
Letter Naming																
Grade 3																
Oral Reading Fluency													x	x	x	x
Nonsense Word Fluency																
Letter Naming																

Note. DIBELS = Dynamic Indicators of Basic Early Literacy Skills (Good, Simmons, & Smith, 1998).

provided by a national *Success for All* consultant, paid for by the district. Relevant enhancements to the program included four adult tutors who were stationed in the building and provided 30 min of daily tutoring four times per week for students who needed additional assistance. A total of 164 children in the study sample were enrolled in a literature-based reading program; 107 used *Success for All*, and 111 used *Reading Mastery*.

Statistical Analysis

Descriptive statistics in the form of cross tabulations, means, and standard deviations were used to explore the frequency and magnitude of specific variables of interest. Pearson product–moment correlation (r) was used to examine the linkages between the three DIBELS measures at common points in time, with respect to a single trajectory of progress toward more proficient reading. Hierarchical linear modeling (HLM; Bryk, Raudenbush, Cheong, & Congdon, 2000; Raudenbush & Bryk, 2002) was used to address research questions related to the pattern of growth in early literacy skills and oral reading fluency. HLM has a number of distinct advantages:

1. It explicitly represents individual growth.

2. It has generally more flexible data requirements because repeated measurements are nested within the student.

3. It is tolerant of missing data (Bryk & Raudenbush, 1992, pp. 133–134).

Another unique advantage of HLM analysis is the ability to compute the mean level (i.e., intercept) at a single point in time and test for mean differences between groups at this point in time (Raudenbush & Bryk, 2002).

Using HLM, a number of models were fit to the data to describe the pattern of growth over time. Because of our interest in endpoint performance, we calculated the mean intercept in these models at the last measurement occasion for each measure: Letter Naming (8th occasion), Nonsense Word Fluency (12th occasion), and Oral Reading Fluency (16th occasion). Models were fit to determine (a) whether growth was linear or curvilinear; (b) whether growth parameters varied across students; (c) the need to represent cohort in the model; and (d) the effects of type of curriculum, risk, and the Curriculum by Risk interaction on growth parameters. Cohort, curriculum, and risk were modeled as fixed effects, that is, values that did not vary across participants, whereas random effects were fit to vary. Growth curve analyses for Letter Naming, Nonsense Word Fluency, and Oral Reading Fluency were best modeled without the cohort variable by linear (all three) and curvilinear (Letter Naming and Oral Reading Fluency only) effects and random slopes and intercepts.

Results

Proportion of Students Screened as At Risk

Academic screening using the DIBELS scores yielded that 197 (51.4%) of the 383 students showed academic risk (see Table 2; 137 were only at academic risk, whereas 60 were at behavioral risk as well). Based on the behavioral screening procedures, 100 (26%) students were determined to be at behavioral risk. SSBD Maladaptive Behavior scores for the students with behavioral risk (externalizers) averaged 26 to 33 across years, with Adaptive Behavior scores averaging 35 to 36 across schools and years. Maladaptive Behavior scores for the internalizing group averaged 14 to 15, with Adaptive Behavior scores averaging 41 to 57. For the 100 students at behavioral risk, 40 (10% of the total sample) exhibited behavioral risk alone and 60 (16%) also showed academic risk. For students who were externalizers, 57% were at academic risk. For students who were internalizers, 82% were at academic risk. With one

Table 2

DIBELS Mean Scores and Standard Deviations for Letter Naming and Nonsense Word Fluency Subtests by Student Risk Group

	Letter Naming				Nonsense Word Fluency			
	K (winter)		1st grade (fall)		1st grade (fall)		1st grade (winter)	
Risk group	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
No risk	46.25	10.69	54.37	14.69	44.07	20.42	59.04	22.24
Behavioral	44.50	11.76	58.05	16.81	53.75	30.66	57.75	25.05
Academic	18.86	12.59	31.25	15.85	20.41	14.56	32.04	17.14
Behavioral and academic	18.36	14.37	29.78	17.79	18.61	16.30	31.32	17.75

Note. Benchmarks for Letter Naming for kindergarten in winter = 27 per minute, for first grade in fall = 36 per minute; benchmark for Nonsense Word Fluency for first grade in winter = 50 per minute. DIBELS = Dynamic Indicators of Basic Early Literacy Skills (Good, Simmons, & Smith, 1998).

minor exception (no-risk students tested on Nonsense Word Fluency in the winter), higher mean scores for Letter Naming and Nonsense Word Fluency were noted for the no-risk peer group, followed by the behavioral risk group, followed by the academic risk group, and the group with both behavioral and academic risks, respectively.

Strength of Linkages Between DIBELS Subtests

Prior work established the predictive relationship among letter naming skills, nonsense word fluency, and oral reading fluency when separated by a year or more (Good, Gruba, & Kaminski, 2002; Good et al., 1998). In the present study, it was possible to evaluate the strength of the concurrent relationships between DIBELS skills because of the measurement of individual students at common points in time (see Table 1). If large and consistent, correlations reflect a common progress trajectory toward increased reading proficiency. Overall, these correlations were large and statistically significant. Pearson product–moment correlations between adjacent skills were .79 for letter naming and nonsense word fluency ($n = 362$, $p < .0001$) and .78 between nonsense word fluency and oral reading fluency ($n = 1087$, $p < .0001$); these were only slightly larger than the correlations between the more distant skills, letter naming and oral reading fluency ($r = .74$, $n = 255$, $p = .0001$). Overlapping DIBELS skills accounted for a substantial range of variance in each other on the order of 55% and 62%. These strong relationships between earlier and later DIBELS skills that conceptually and empirically reflect a general progress trajectory toward learning to read are particularly germane to the issue of early identification of students at risk for reading problems.

Pattern of Growth and Influences

Differences in Reading Curricula. HLM results indicated that students' growth in letter naming, nonsense word fluency, and oral reading fluency was differentially influenced by reading curriculum (see Table 3; upper panel, Table 4; Figure 1). Overall results indicated accelerating growth patterns for all three fluency measures with some slowing (letters and oral reading). As shown in Tables 3 and 4 and Figure 1, the main effect for curriculum type significantly influenced growth patterns of slope and acceleration, leading to significant differences in mean performance at the end of first grade (letter naming fluency), second grade (nonsense word fluency), and third grade (oral reading fluency). Students' skills in each area were positively affected by *Reading Mastery, Success for All,* and literature-based curricula, in that order. In kindergarten, students began at a mean of about 12 letters per minute, growing to more than 60 to 70 per minute. Letter naming endpoint means were 61.4 (literature-based), 68.16 (*Success for All*), and 74.92 (*Reading Mastery*) letters per minute (see Table 4). Similar fluency gains were made for nonsense word and oral reading fluency (see Figure 1), and both skills were accelerated most by the *Reading Mastery* curriculum.

Early Behavioral and Academic Risk. The main effect of early risk on later oral reading fluency was that it significantly influenced growth patterns leading to differences in Grade 3 endpoint performance (see lower panel, Table 4). The most favorable pattern of growth was shown by the group with no risk, followed by the behavior risk group, the academic risk group, and students at risk for both. As shown in Figure 2, students with behavior risks, academic risks, or both made the least progress in oral reading fluency over time. At the end of the study, mean fluencies were 108.98 (no risk), 95.05 (behavior risk), 81.13 (academic risk), and 67.21 (both).

Risk and Curriculum. The effects of both risk and curriculum were examined in an HLM analysis that included both effects and their interaction (see Figure 3). Main effects were significant for both risk (slope, $t(377) = -1.922$, $p = 0.05$) and curriculum (intercept,

Table 3

Letter Naming and Nonsense Word Fluency Growth Curve Parameters

Effect	Intercept end of 1st grade				Slope				Acceleration			
	M	*t*	*df*	*p*	*M*	*t*	*df*	*p*	*M*	*t*	*df*	*p*
Letter Naming												
Overall	60.95	47.77	190	0.0001	5.01	9.40	190	0.0001	–0.23	–2.75	190	0.0060
Curriculum												
Adjustment	6.76	1.27	189	0.0001	–1.68	–2.93	189	0.0040	–0.39	–4.49	189	0.0001
Literature based	61.40				4.73				–0.30			
Success for All	68.16				3.05				–0.69			
Reading Mastery	74.92				1.36				–1.09			
Nonsense Word Fluency												
Overall	78.30	32.25	382	0.0001	6.76	17.65	382	0.0001	—	—	—	—
Curriculum												
Adjustment	6.56	2.09	381	0.0370	–0.02	–0.05	381	0.9610	—	—	—	—
Literature based	79.22				6.74							
Success for All	85.78				6.72							
Reading Mastery	92.35				6.69							

Note. A dash indicates linear model only. Benchmarks for Letter Naming for kindergarten in winter = 27 per minute, for first grade in fall = 36 per minute; benchmark for Nonsense Word Fluency for first grade in winter = 50 per minute.

Table 4

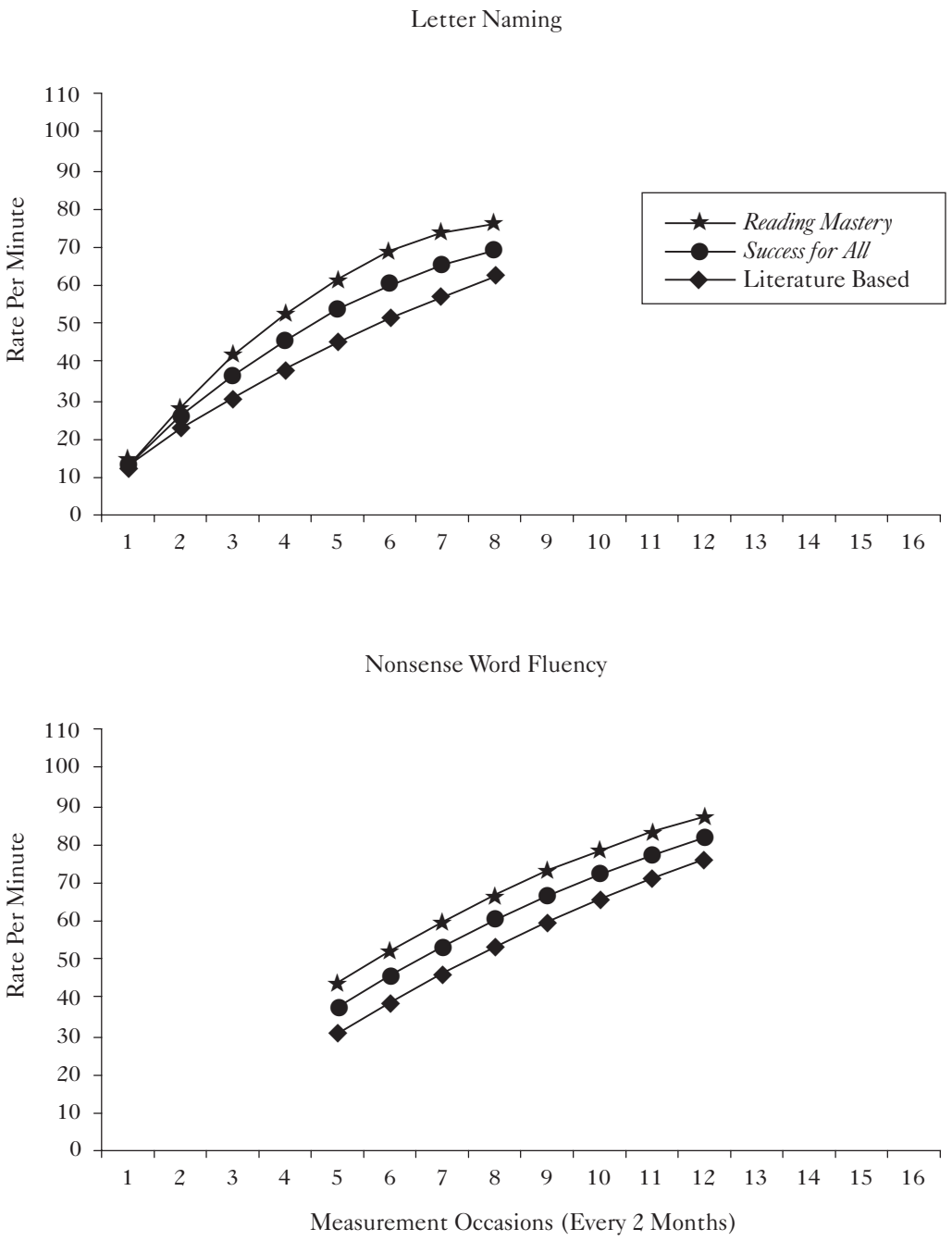
Oral Reading Fluency Growth Curve Parameters

	Intercept end of 3rd grade				Slope				Acceleration			
Effect	*M*	*t*	*df*	*p*	*M*	*t*	*df*	*p*	*M*	*t*	*df*	*p*
Overall	91.04	38.721	380	0.0001	4.70	9.390	380	0.0001	–0.19	–4.156	380	0.0001
Curriculum												
Adjustment	8.71	2.960	397	0.0040	0.77	1.183	397	0.2370	0.06	1.130	397	0.2590
Literature based	92.29				4.80				–0.19			
Success for All	100.99				5.57				–0.12			
Reading Mastery	109.70				6.34				–0.06			
Risk Adjustment	–13.92	–7.676	379	0.0001	2.55	6.477	379	0.0660	0.30	8.393	379	0.0001
None	108.98				1.43				–0.57			
Behavioral	95.05				3.98				–0.28			
Academic	81.13				6.53				0.02			
Both	67.21				9.09				0.32			

Note. Adjustment = Adjustment in growth parameter. *Success for All* (1999); *Reading Mastery* (1995).

Figure 1

Fitted letter naming, nonsense word fluency, and oral reading fluency growth curves, as a function of curriculum.

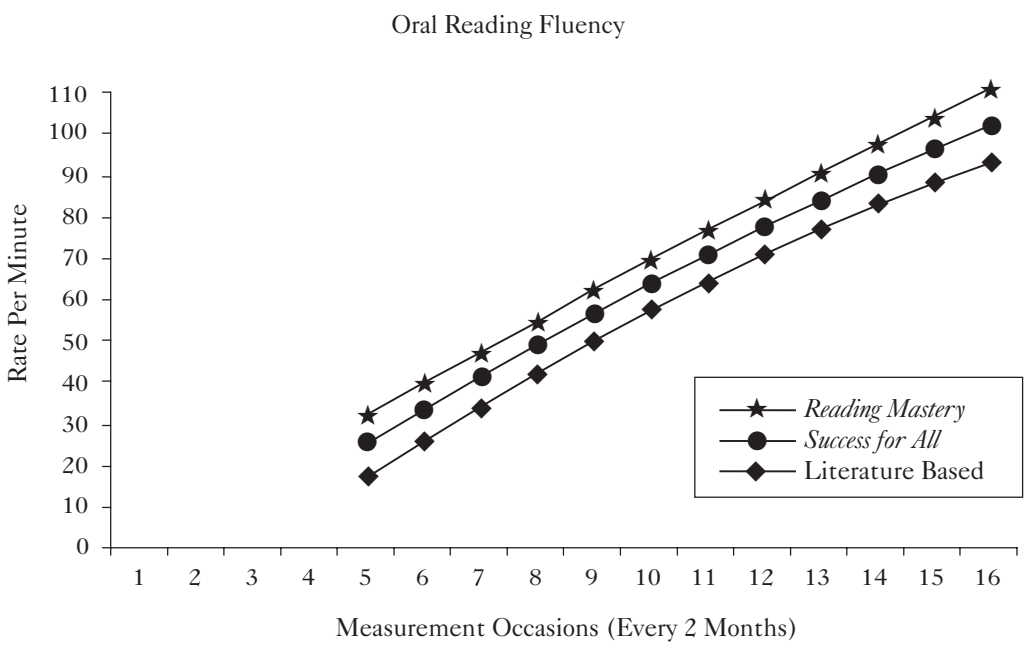


$t(377) = -5.210$, $p = 0.000$; slope $t(377) = 3.607$, $p = 0.001$; and acceleration, $t(377) = 3.800$, $p = 0.0001$), but the interaction effect was not significant.

At the measurement occasion beginning in first grade, group oral reading fluency means ranged from 5 to 40 words correct per minute; at the end of third grade, this number ranged from 68 to 129. Clearly, both risk and curriculum conditions made a difference in terms of students' growth over time and in their attainment of end-of-grade benchmark levels over time (see Figure 3). Students with academic risks, behavioral risks, or both made comparatively less progress than did students with no risks at all, and students using the *Reading Mastery* curriculum made more progress than did students using the *Success for All* or the literature-based curricula. Also interesting were the shapes of these growth curves. Students with no risk or with behavioral risks typically showed faster initial growth over time and then slowly decelerated, whereas students with academic and both academic and behavioral risks initially showed slow growth in first grade but increased acceleration into third grade. Although high-risk students (i.e., both and academic) showed growth, at the end of third grade they fell below all end-of-grade benchmarks and had not caught up to their lower risk (i.e., none or behavior) peers. When higher risk students did surpass lower risk students it was because the higher risk students were using the most effective curriculum (e.g., higher risk students using *Reading Mastery* outperforming lower risk students using a literature-based curriculum).

Figure 1 (continued)

Fitted letter naming, nonsense word fluency, and oral reading fluency growth curves, as a function of curriculum.



Discussion

Early Risk Screening and Monitoring in Urban Schools

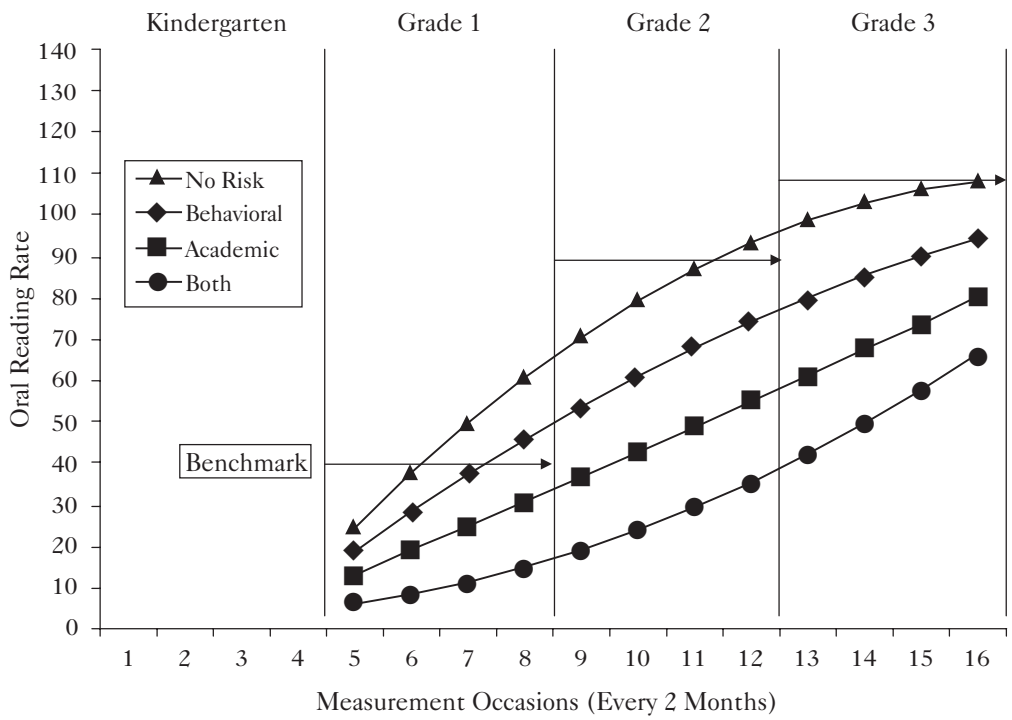
In general, findings indicated that early screening for academic and behavioral risks can be successfully and reliably conducted in urban elementary schools using the DIBELS and SSBD. Data-collection assistance for annual screening and ongoing assessments was provided by the researchers. Thus, it remains to be seen in future research how school personnel alone could successfully implement these practices. The DIBELS assessments showed that students not at risk were meeting the benchmark scores based on national sampling for the Letter Naming and Nonsense Word Fluency subtests (Kaminski & Good, 1996). As in prior work (Good et al., 1998), it was demonstrated that scores across students for Letter Naming and Nonsense Word Fluency were significantly correlated to later oral reading skills for all students, empirically demonstrating that DIBELS skills represent a general trajectory toward reading proficiency.

Curriculum Influence on Early Reading Performance

A second purpose of the study was to assess the impact of curriculum. Findings for DIBELS showed that differential effects for growth of early literacy skills (i.e., letter naming, nonsense word fluency, and oral reading fluency) were significantly influenced by the district- or school-mandated curricula. Across

Figure 2

Fitted oral reading fluency growth curves, as a function of risk.



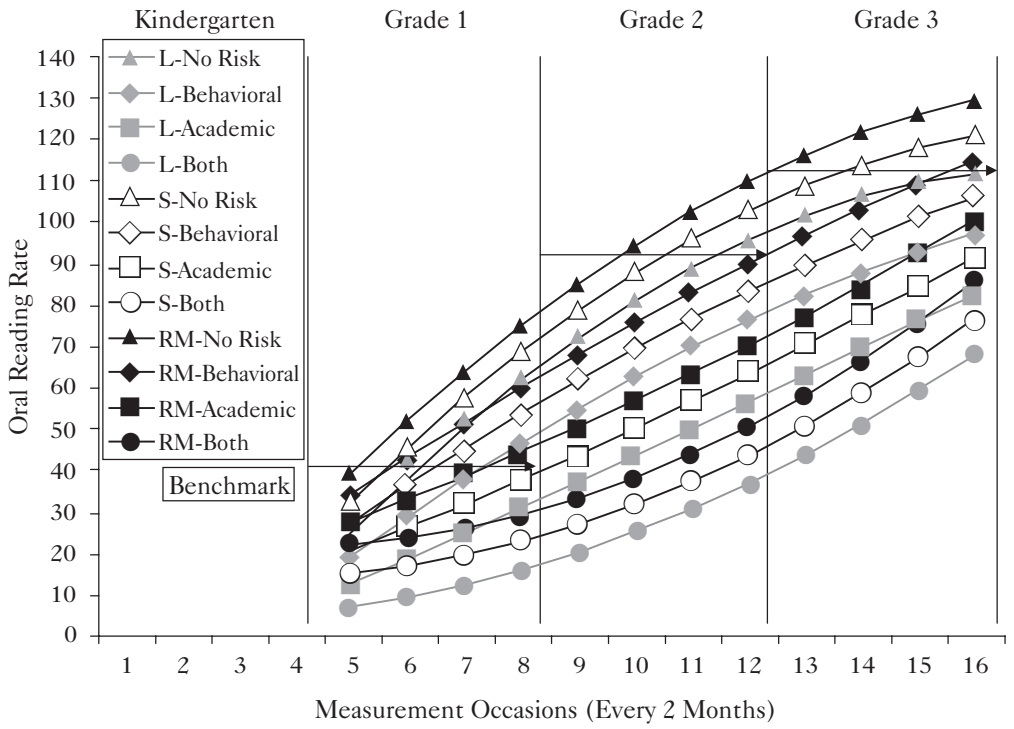
students and skills (see Figure 1), *Reading Mastery* was associated with the best growth trajectories and higher endpoint performance, which confirmed Foorman, Francis, Fletcher, and Schatschneider's (1998) findings regarding the efficacy of direct instruction in letter–sound correspondences practiced in decodable text. These results supported the notion that the primary-level reading curriculum differentially influenced the pattern of individual students' growth over time, the number of students falling behind in early literacy skills (Al Otaiba & Fuchs, 2002), and the additional individual and small-group accommodations that would be necessary to accelerate students' lower growth patterns (Al Otaiba & Fuchs, 2002; Good et al., 1998; Moody, Vaughn, & Schumm, 1997).

Risk Influence in Early Reading Performance

An additional area under investigation was the relationship between students' growth in oral reading fluency and early risk factors. Results showed that early risk influenced students' progress in reaching reading fluency. Children with academic and behavioral risks had the greatest difficulty becoming fluent readers, followed by students with academic risk only, and then students with behavioral risk only.

Figure 3

Fitted oral reading fluency growth curves, as a function of risk (4 levels) and reading curriculum (3 levels) with end of grade DIBELS benchmarks.



Note. L = literature-based curriculum; S = *Success for All* (1999) curriculum; RM = *Reading Mastery* (1995) curriculum.

Students in kindergarten through second grade with a single risk factor (academic or behavioral) performed lower than did the general population, according to this sample in five urban schools.

These findings concur with current literature (D. Fuchs, Fuchs, & Burrish, 2000). Poor readers differ in levels of achievement and engagement, conduct, first language, background knowledge, and response to instruction (D. Fuchs et al., 2000). As evidenced in this urban student sample, this diversity makes it difficult for all students in a classroom to achieve common performance goals (Allington, 1991; Baker, Simmons, & Kame'enui, 1995; Vaughn & Schumm, 1995). Children who start school with lower skill levels are least ready and develop slower over time without intervention, but their development can be accelerated if they are exposed to a more effective curriculum, the final factor related to the combined effects of risk and curriculum on students' reading performance over time.

Students who performed in a "typical" range on initial screening instruments met benchmark scores on Letter Naming, Nonsense Word Fluency, and Oral Reading Fluency subtests, regardless of curriculum. Students who were at risk for behavioral problems but performing at benchmark levels on early DIBELS assessments also had scores similar to those of peers who were not at risk. All students showed greater progress in becoming fluent readers with exposure to *Reading Mastery* (see Figure 2). In all, the following conclusions were supported:

- The *Reading Mastery* curriculum produced better overall student oral reading outcomes and better outcomes for the highest risk population in the study, including students from multiple culturally diverse groups or low SES communities and English language learners.
- The *Reading Mastery* curriculum produced better growth in reading fluency for students with academic risk, behavioral risk, and both risks (see Figure 3).
- The *Success for All* curriculum, compared to the *Reading Mastery* curriculum, produced lower growth in reading fluency for all students, including those in the risk groups, but produced better outcomes than did the literature-based curricula.
- The literature-based reading curricula produced the least growth in reading fluency with the same high-risk populations. These findings were confirmed by looking at group mean statistics and growth curve parameter statistics. Students in the literature-based group performed at a lower level than did students in either of the other two groups, even when enhancements such as small-group instruction, instructional-level student groupings, or pullout sessions using strategic skill building lessons were implemented.

Conclusions

A number of variables may have contributed to the growth findings. As mentioned, the primary curriculum taught in high-risk schools appeared to be a determining factor—the literature-based programs were least helpful to students showing early academic risk. It is important to note that one possible reason for the lower performance is that the literature-based curricula selected in participating schools provided limited systematic phonics instruction, and research has shown these skills to be important precursors to reading fluency. The literature-based curricula were appropriate for some students (i.e., those with benchmark performance on early kindergarten assessments); however, its schoolwide use was associated with higher numbers of students needing extra instruction or secondary- and tertiary-level interventions in order to reach benchmark levels of performance. Early inter-

vention for the students in this study was not implemented early enough, nor was it consistent, structured, or intense enough to produce noticeable effects for enough of the students. More frequent progress monitoring or more frequent assessment for students lagging behind (i.e., beyond the 3–4 times a year assessments that were conducted for the study) may have stimulated more urgency to introduce such efforts (Deno, 1989; L. S. Fuchs, Fuchs, & Hamlett, 1993; Kaminski & Good, 1996). A "one size fits all" school administration philosophy regarding curriculum choices, continued reliance on whole-class instruction, and groups that are too large promote higher rates of failure than necessary (Elbaum, Vaughn, Hughes, & Moody, 1999).

Additional variables involve the defining characteristics of the curriculum used and their effects on student learning. Research has shown that students in typical general education classrooms, using school-mandated curricula, vary widely in their engagement in key reading behaviors during instruction (e.g., Greenwood, 1996a) and are provided infrequent opportunities to respond (e.g., Allington & McGill-Frazen, 1989; Haynes & Jenkins, 1986). Observation studies of reading instruction for students with LD and EBD conducted over the past two decades have indicated that students spend too much time in nonacademic behaviors (e.g., waiting, off-task behaviors; Haynes & Jenkins, 1986), less time in small-group and individual instruction (Gelzheiser & Myers, 1991; Vaughn, Moody, & Schumm, 1998), half of their reading time completing worksheets and doing independent seatwork (Haynes & Jenkins, 1986; Olinger, 1987; Zigmond & Baker, 1994), and limited time engaging in reading comprehension activities (Vaughn et al., 1998).

The less students respond, the less they learn, and the more likely they are to acquire skill deficits. Too often, educational practice fails to differentially and systematically teach early literacy skills to students who are falling behind in the early primary grades. In the current sample, we observed dramatically different levels of student responding to reading instruction and lower engagement during reading instruction between schools (e.g., Greenwood, Abbott, & Tapia, in press; Greenwood, Horton, & Utley, 2002). In particular, we observed that implementation of *Reading Mastery* that focused on small-group instruction (i.e., three to eight students per group) provided two to three times the number of opportunities for students to engage in critical reading behaviors. In addition, teachers implementing this curriculum provided far more praise and feedback statements to students than did those in the classrooms implementing literature-based instruction and the *Success for All* curriculum. These findings concur with prior findings reporting significant effect sizes for direct instruction and peer-tutoring reading interventions for elementary students with EBD (Coleman & Vaughn, 2000). *Reading Mastery,* the more effective curriculum in this sample, is a Direct Instruction program. *Success for All,* the second most effective curriculum, includes peer reading and a tutoring component.

Limitations and Suggested Future Research

Findings supported the following reading initiatives to prevent failure: early screening for behavioral and academic risks and highly structured, direct instruction curricula in high-risk schools as a primary prevention step. Together, these procedures appeared to be an empirically superior way of conducting early intervention to promote larger numbers of fluent readers than were more traditional referral approaches. There are several limitations to the current study and suggestions for future research. Schoolwide studies should be conducted with larger urban school and student samples to replicate current findings and to tease out the effects in randomized experimental, control group designs that vary curricula and early screening. One nagging problem

in the current study was the low percentage of returned parent consent forms, which restricted the percentage of participating students; however, the sample was considered generally representative of school populations. We recommend conducting future investigations of schools committed to early, systematic progress monitoring for lower performing students (i.e., data-based decision-making with allocation of resources) to ensure additional secondary and tertiary interventions when needed.

A related limitation is that systematic measurement of curriculum procedural integrity was not conducted in the study. Anecdotal reports from an independent consultant for School 3 indicated that *Reading Mastery* was implemented with high fidelity. Similar reports were not available for the other schools. Measures of implementation are needed to document the fidelity of instructional and curriculum interventions and to unambiguously determine causal effects for student outcomes (Gersten, Baker, & Lloyd, 2000). For students showing early emotional and behavioral risk, an appropriate curriculum that promotes active responding and success in early literacy may prove to be one of the strongest intervention components for combating future problems.

An important finding from the study was that there was a high occurrence of early behavioral risk in the students sampled; however, it was noted that behavioral risk alone in young elementary-age children was less of a risk factor, in terms of achieving reading fluency, than was academic risk alone. Far more research is needed in the area of targeted interventions for young students with behavioral risk, particularly concerning students with both academic and behavioral risks (e.g., Falk & Wehby, 2001; Gunter & Denny, 1998). Research investigating how academic and behavior problems influence one another should be conducted using a design that monitors behavior and academic outcomes closely. Sadly, our research has confirmed what others have reported—60% of students with behavioral problems also exhibited academic risk (Kauffman, 2001). How academic failure affects future emotional and behavioral disorders for students, and vice versa, remains unclear (Rock, Fessler, & Church, 1997). More intervention research is needed for young children with multiple risks, particularly on multicomponent interventions that improve pivotal behaviors such as reading, social interpersonal skills, and behavioral civility (Kamps, Kravits, Rauch, Kamps, & Chung, 2000; Walker et al., 1998). Only longitudinal research can address these multiple issues (Hinshaw, 1992; Rabiner & Coie, 2000).

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About the Authors

DEBRA M. KAMPS, PhD, is a senior scientist with the Schiefelbusch Life Span Institute at the University of Kansas. Her current interests include prevention and early intervention for children with behavior/learning problems and educational interventions in urban environments. She is currently the director of the Center for Early Intervention in Reading and Behavior, Juniper Gardens Children's Project.

HOWARD P. WILLS, PhD, is currently a project coordinator for the Center for Early Intervention in Reading and Behavior, Juniper Gardens Children's Project. His current inter-

ests include teacher training and academic and behavioral interventions.

CHARLES R. GREENWOOD, PhD, is the director of the Juniper Gardens Children's Project and co-principal investigator of the Center for Early Intervention in Reading and Behavior at Juniper Gardens Children's Project, University of Kansas. His interests are in early intervention/prevention of reading and behavior problems and how reading and behavior problems affect students' being at risk for school failure.

STEPHANIE THORNE, MA, is a doctoral student at the University of Kansas. She currently is a graduate research assistant at Juniper Gardens Children's Project. Current interests include early intervention for children with behavioral problems and functional assessment in clinical and school settings.

JUNELYN F. LAZO, ABD, is a doctoral candidate in the Department of Human Development and Family Life at the University of Kansas. Her current interests include funding and provision of behavioral resources, as well as outcome research on the effectiveness of agency services. She is currently the behavioral resources manager for the Regional Center of Orange County.

JENNIFER L. CROCKETT, PhD, is a board certified behavior analyst in Nashville, Tennessee. Professional interests include assessment and treatment of severe behavior disorders, functional analyses of behaviors, functional communication training with children with autism, and online instruction of behavioral interventions in autism for parents and professionals.

JUDY McGONIGLE AKERS, BS, is the executive vice president of Della Lamb Community Services, a comprehensive nonprofit social services organization serving low-income families, children, and older persons since 1897. Her interests include teacher training, academic and behavioral interventions, charter school success, educational success with low-income and at-risk students.

BRENDA L. SWAGGART, PhD, is a special education process coordinator for the Belton School District. Her current interests include emotional and behavioral disorders, autism, and early intervention for students at risk for academic and/or behavioral concerns. Address: Debra M. Kamps, Juniper Gardens Children's Project, 650 Minnesota Ave., Kansas City, KS 66101; e-mail: dkamps@ku.edu

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