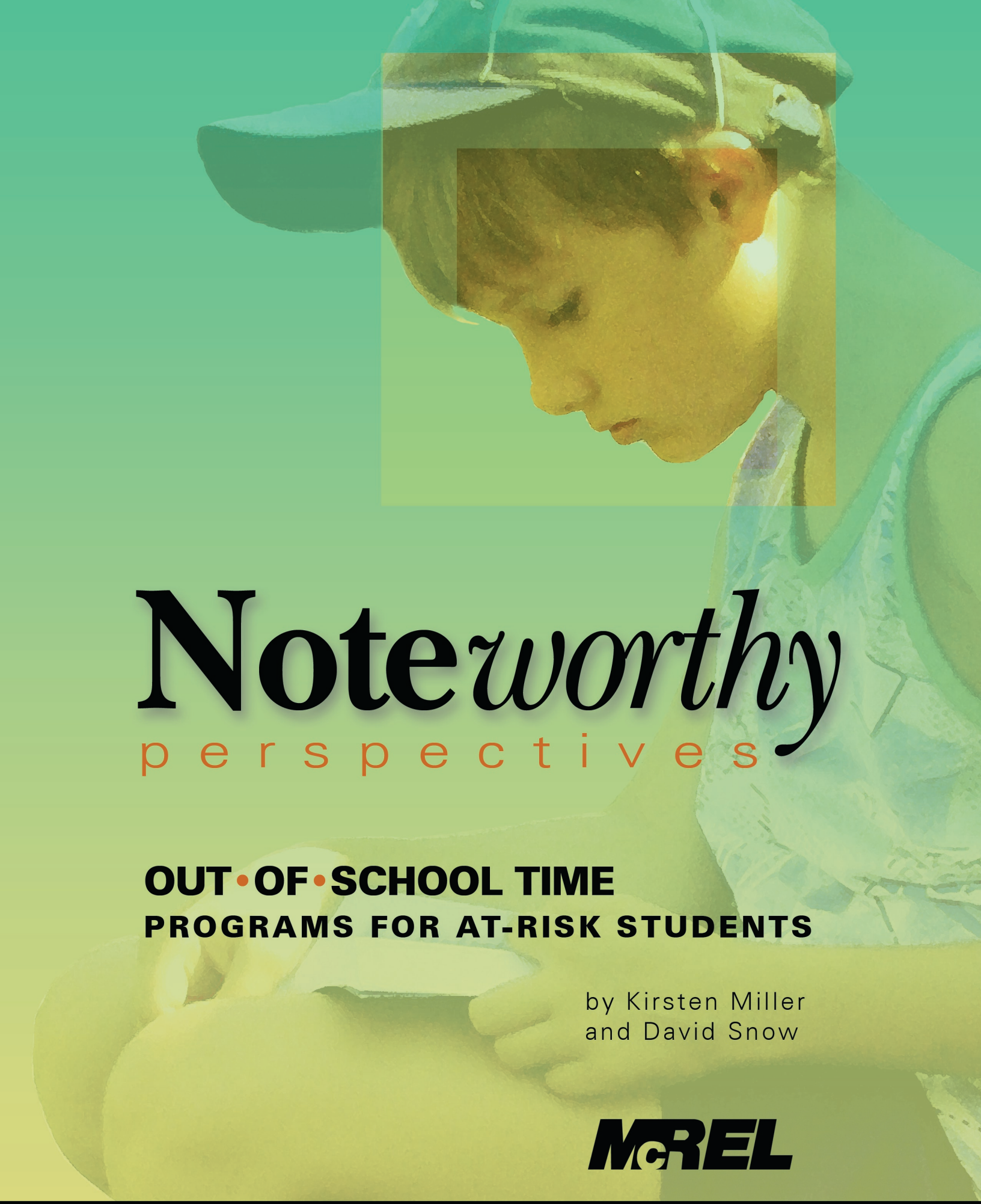

Noteworthy

perspectives

OUT•OF•SCHOOL TIME
PROGRAMS FOR AT-RISK STUDENTS

by Kirsten Miller
and David Snow

McREL

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PERSPECTIVES

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PREFACE

Mid-continent Research for Education and Learning (McREL), located in Aurora, Colorado, is a private, nonprofit organization founded in 1966. McREL's mission is to make a difference in the quality of education through applied research, product development, and service.

This publication was created through McREL's contract with the U.S. Department of Education's Institute of Education Sciences to serve as the regional educational laboratory for the Central Region states of Colorado, Kansas, Missouri, Nebraska, North Dakota, South Dakota, and Wyoming. In this role, McREL is implementing a comprehensive, problem-based research, development, and service program designed to create the knowledge, tools, and strategies needed to transform low-performing schools into high-performing learning communities.

For more than a decade, McREL has been at the forefront of research, practice, product development, and evaluation related to standards-based education. McREL's national leadership area under the regional laboratory contract is standards-based educational practice.

This issue of *Noteworthy*, written primarily for school and district leaders, policymakers, and program administrators, draws largely from McREL's recent research synthesis, *The Effectiveness of Out-of-School-Time Strategies in Assisting Low-Achieving Students in Reading and Mathematics* (Lauer, Akiba, Wilkerson, Apthorp, Snow, & Martin-Glenn, 2004). This publication represents part of McREL's continuing efforts to build on its expertise, turn research into practical guidance, and work with schools, districts, and states to improve their practices and capitalize on the great potential that standards-based education holds for students.

There are a number of out-of-school-time research reports that are not presented here because program effects on at-risk students were not studied, or because they did not meet the rigorous design criteria required for inclusion in McREL's synthesis. These other studies are, nonetheless, good sources of information and programmatic ideas, and they are worthy of review. This *Noteworthy*, however, is intended to bring a research-based perspective to those who seek to enhance their understanding of out-of-school-time programming for at-risk students. The authors sincerely hope that readers will find this publication to be an informative and practical resource for use in understanding, evaluating, and designing out-of-school-time programs.

The authors wish to acknowledge the contributions of a number of individuals in the preparation of this publication. In particular, thanks go to the other authors of McREL's recent synthesis, Patricia Lauer, Helen Apthorp, Stephanie Wilkerson, Mya Martin-Glenn, and Motoko Akiba.

Without their work, along with the assistance of Zoe Barley, Becky Van Buhler, Terry Young, Barbara Aiduk, and Robyn Alsop, this publication could not have been written. Appreciation also is extended to external reviewers Joyce Bales and David Waters, and to McREL staff members Elena Bodrova, Lou Cicchinelli, Maggie Cooper, Bryan Goodwin, Jodi Holzman, Danette Parsley, and Adrienne Schure for their helpful comments. The authors also would like to acknowledge Brian Lancaster's design of the cover of this publication and desktop publishing assistance. A debt of gratitude also is owed to the authors of the research that supports this publication. Last, but certainly not least, special thanks to Barbara Gaddy and Ceri Dean for their work on this project. With vision and care these two educators have brought this *Noteworthy* though many iterations to this final version.

Reference

Lauer, P. A., Akiba, M., Wilkerson, S. B., Apthorp, H. S., Snow, D., & Martin-Glenn, M. (2004). *The effectiveness of out-of-school time strategies in assisting low-achieving students in reading and mathematics*. Aurora, CO: Mid-continent Research for Education and Learning.

CHAPTER 1

Introduction

At some point in their lives, everyone has said it: there aren't enough hours in the day. For many children with learning difficulties, and their teachers, this old maxim rings all too true. When children fall behind in a content area or areas, there may not be sufficient time in the school day to offer the remedial instruction necessary to get them up to speed. One potential solution for making up this deficit is out-of-school time, or OST, programs.

As the name implies, out-of-school time programs are targeted to the hours that school-age children are not in school. The most common OST formats are after-school and summer-school programs. Researchers also have studied before-school and Saturday school programs.

In 2001, 6 million of the 54 million K–8 children in the United States participated in after-school programs (De Kanter, 2001). These programs were either community-sponsored after-school programs or school-based extended-day programs. Between 1994 and 2001, the number of schools offering after-school programs doubled (De Kanter, 2001). But according to the National Institute on Out-of-School Time (2004), millions of children between the ages of 6 and 12 do not participate in any kind of adult-supervised after-school activity. Advocates of after-school programs have noted that there is increasing public support for the development and funding of after-school programs in public schools (The After-School Corporation, 1999; Fashola, 2002).

IN THIS CHAPTER

- The Evolution of OST programs
- Past Research
- The McREL Out-of-School Time Research Review

This chapter provides historical background on OST programs in the United States, a look at the context within which OST programs are now being developed, and an overview of the body of available OST research. The chapter also briefly describes the McREL synthesis framework, on which this issue of *Noteworthy* is partially based.

The Evolution of OST Programs

Though out-of-school time programs as we now know them (e.g., after-school, summer school) were not fully implemented in the United States until the 1970s and 1980s, the roots of OST run far deeper, extending as far back as the late 1800s (Harvard Family Research Project, 2000). Out-of-school time programs first began to receive

federal funding during World War II, when the U.S. government began funding after-school programs as a means of providing childcare for women entering the workforce for the first time. Government funding of these programs ceased with the end of the war, when many women again left the workforce.

In the 1950s, formal summer school programs emerged, originally as a potential solution for the prevention of behavior problems. Summer school administrators, however, quickly began to see these program sessions as a good avenue for remediation.

A number of societal factors have been cited by researchers as affecting the push to create summer school programs reflecting an academic emphasis, including (1) family influences (e.g., maternal employment and single parent households), (2) the need for the United States to maintain a globally competitive education system, and (3) the emphasis on rigorous learning standards and minimum student proficiency requirements. Cooper, Charlton, Valentine, and Muhlenbruck (2000) contend that, although additional purposes of summer school programs will likely continue to be identified, their focus on academic remediation will probably always remain.

Historically, meeting the needs of low-income children has been a primary reason for the development of OST programs, particularly after-school programs. Because safety tends to be a greater concern in low-income neighborhoods than it is in middle-income neighborhoods, there is a greater need for low-income children's out-of-school time to be supervised by adults. However, children from low-income families are less likely to have after-school caregivers available in their homes.

The push to "even the odds" for the nation's low-income children began to pick up momentum in the 1960s. During his 1964 Presidential campaign, Lyndon Johnson spoke of an America "where no child will go unfed and no youngster will go unschooled." Title I of the original

FROM THE FIELD:

What advantages do you see in serving at-risk students in OST programs?

In our after-school classes, children are often in a class of their interest and/or a subject they need extra help with. These classes are smaller in size than a regular classroom, so the students receive more one-on-one attention. With the smaller teacher ratios, children can get the individual help and attention they need, thus increasing their skill level, which in turn leads to higher self confidence. Children also get the opportunity to meet other children their age and/or work in a multi-age setting.

Denise Southwell, Teacher
Saline Community Education
Saline, MI

Elementary and Secondary Education Act was created in part because of data indicating that low-income children are at risk for academic failure. It became evident that low-income children were in need of additional educational time to supplement what they experienced during regular school hours (Cooper et al., 2000; Borman & D'Agostino, 1996). Despite concerns that after-school programs that emphasized academics would interfere with time spent in play, these programs have become the norm as educators search for ways to meet the needs of their low-income or otherwise at-risk students (Halpern, 2002). Concerns about the social needs of children have, in many cases, led to the incorporation of social components into OST programs.

Recent developments in education legislation will likely intensify the discussion about the potential benefit of OST programs to increase the achievement of at-risk students. Under the No Child Left Behind Act, all schools and states are held accountable for ensuring that all students reach or exceed each state's proficient level of performance in reading and mathematics by the end of the 2013–2014 school year. States are required to report disaggregated scores for a number of student subgroups, including economically disadvantaged students, students with disabilities, students from major racial and ethnic groups, and students with limited English proficiency. Disaggregating scores in this manner provides a clearer picture of the progress of different groups of students — information educators can use to target and refine educational programs, including programs outside the traditional school day.

Past Research

A wealth of research on OST programs has been conducted over the years. These studies are as varied as the programs themselves. Most of the studies have focused on a specific program or program type, but all have shared the goal of distilling information about what makes a particular program effective. Because of the large number of studies of OST programs, this section is limited to descriptions of reviews and syntheses of OST research.

The first of these is a comprehensive synthesis of summer school research conducted by Cooper and his colleagues (Cooper et al., 2000). Cooper et al. reviewed 93 program studies to better understand the effects of summer school

on student achievement. Their results indicated that summer school had positive academic effects on both middle-income and low-income students. Positive effects on student performance also were found for programs for smaller numbers of students and for programs that provided students with individualized and small-group instruction. Cooper et al. also found that students in the early elementary and secondary grades benefited more from summer school classes compared to students in late elementary grades.

McComb and Scott-Little (2003) provide a narrative review of 27 studies of after-school programs. By comparing study results, they concluded that large variations in program content, size, goals, and research designs prevented a simple answer to the question about the effects of after-school programs on academic outcomes. Instead, they focused their discussion on the *conditions* that favored positive student outcomes. For example, there were indications that low-achieving students benefited more from OST programs than did high-achieving students, and that students who attended the programs more frequently benefited more. Overall, however, the authors were not able to reach any strong conclusions.

The lack of research to support conclusions also was reported in an earlier after-school synthesis conducted by Fashola (1998), who reviewed evaluations of 34 programs delivered in extended-day or after-school formats. The author concluded that the research reveals many promising approaches but that it is limited in the information it can provide.

Miller (2003) reported on a comprehensive narrative review of after-school programs for middle school children. The purpose of Miller's report was to examine the roles of after-school programs in promoting academic success and positive early adolescent development. Miller described the effects of different after-school programs on academic outcomes and on outcomes that Miller and others connect with academic success, such as students' attitudes toward school. Although the report provided valuable information related to all facets of how after-school programs can benefit adolescent development, questions about specific effects on achievement in reading and mathematics were left unanswered.

One study of OST programs that received national attention is the first-year evalu-

ation of the 21st Century Community Learning Centers program (U.S. Department of Education, 2003). Congress authorized this program in 1994 to promote broader use of schools by communities and, in 1998, redesigned the program to provide academic as well as recreational activities to students outside of regular school hours. The first-year evaluation compared the academic and developmental outcomes of elementary and middle school students who attended a 21st Century program with those who did not attend.

In general, first-year findings were discouraging. No significant impacts on achievement were found in reading or mathematics for elementary or middle school students. As a result, it is not possible to link a specific 21st Century program to outcomes of the students served by that program. As the authors (U.S. Department of Education, 2003) noted, "The study was designed to examine the characteristics and outcomes of typical programs and did not attempt to define the characteristics of the best programs" (p. xi). In a footnote they added, "This study focuses on school-based programs that are part of the 21st Century program. Results do not extrapolate to all after-school programs in general" (p. xi). In other words, the evaluation sought to address the effectiveness of the 21st Century grant program as a funding source and not the effectiveness of after-school strategies in general.

Proposed funding cuts to the program as a result of the first-year evaluation drew criticism from some researchers and evaluators of OST programs, who contended that one year of findings was an insufficient basis on which to pass judgment about program effectiveness (Harvard Family Research Project, 2003). A number of critics have called for consolidating knowledge gleaned from many individual evaluations to better approximate the effects of after-school interventions, the approach used for McREL's synthesis.

Second-year findings for the 21st Century grant program were released in October 2004 (Dynarski et al., 2004). Some positive effects were reported. For example, middle school social studies achievement was higher, and elementary school students reported higher feelings of safety. Overall findings were consistent with the first-year evaluation, however.

Reactions to the second-year findings have not yet been widespread, making the

impact of this evaluation unclear. Also, it is important to note that despite the controversy over the initial evaluation, these studies are making an important contribution to our knowledge about OST programs by documenting the great variation in the characteristics of programs across school districts, particularly in the range of activities offered and in the relative emphasis on academic assistance.

The McREL Out-of-School Time Research Review

McREL recently completed a review of research on OST programs for at-risk students (Lauer et al., 2004). The impetus for this work was the "supplemental services" provision of the No Child Left Behind Act (NCLB), which requires that states offer supplementary education services to low-income students in Title I schools that do not achieve adequate yearly progress. Because instruction for supplementary services must occur outside the regular school day, there is interest among educators in the effectiveness of OST strategies for improving student achievement.

After reviewing thousands of studies, McREL researchers identified 27 reading studies and 33 mathematics studies that met the rigorous design criteria required for inclusion in the synthesis. Each of these studies compares an OST treatment of at-risk public school students to the performance of program non-participants. McREL's synthesis contributes to the knowledge base about OST strategies for low-achieving or at-risk students in the following ways:

- By examining research on OST strategies delivered in all timeframes, including summer school, after school, extended day, before school, vacation sessions, and Saturday schools.
- By including the results of separate analyses of the effectiveness of OST strategies for student achievement in reading and in mathematics.
- By including studies only if the design involved a comparison group of students who did not experience the OST strategy under investigation.
- Studies were coded for alignment

with criteria of research quality, and synthesis results were described in relationship to these ratings.

An important point to keep in mind is that McREL's review of the research focused on whether or not OST programs provided benefits specifically for at-risk students. To qualify for inclusion in the synthesis, the study had to examine the effectiveness of an OST strategy for low-achieving students or students at risk for school failure. The study could include students performing at other achievement levels, but it had to disaggregate effects for those entering an OST program with low achievement or at risk for low achievement. McREL's goal was to assess the effectiveness of OST strategies for those students who are most likely to need them. Low achievement could be determined by student performance on standardized tests or classroom assessments or through teacher-assigned grades or recommendation for assistance. At-risk status could be determined by characteristics typically associated with lower student achievement and school dropout in large-scale data collections including low socioeconomic status (SES), racial or ethnic minority background, a single parent family, a mother with a low level of education, and limited proficiency in English (Slavin & Madden, 1989; Miller, 1993).

McREL's analysis of the available research pointed to small overall positive effects in both reading and mathematics programs. Within the synthesis, impacts were reported as effect sizes. For this document, however, the effect sizes have been converted into percentile point gains. The synthesis authors identified an average 5 percentile point gain for reading and a 6.5 percentile point gain for mathematics programs. Put another way, a student scoring at the 50th percentile in reading, who attained average gains from an OST program, would increase his or her achievement to the 55th percentile. For students scoring close to proficiency cut scores, such a gain could be quite significant.

More important, McREL's review of the research identified specific program characteristics and approaches associated with improvements in reading and in mathematics. The following chapters include examples that illustrate these characteristics and approaches. This information can be used by OST program leaders to inform program design and implementation.

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CHAPTER 2

Effective OST Reading Programs

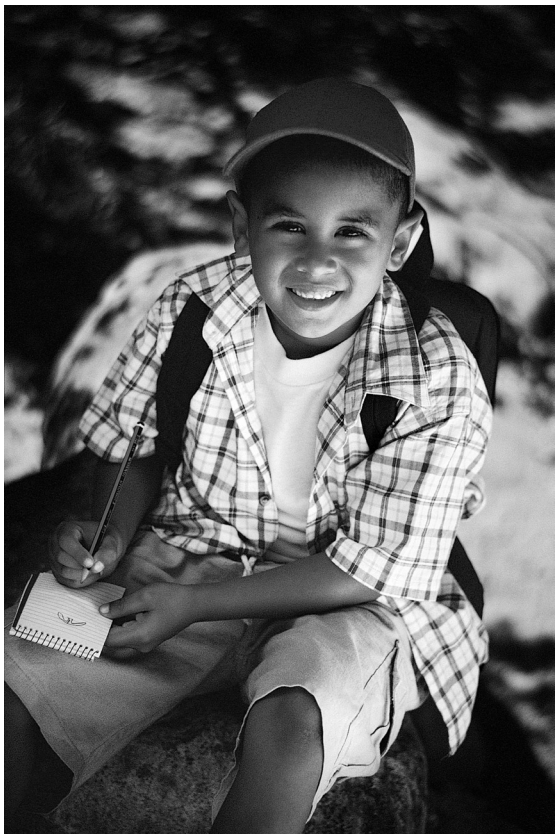
Proficient readers often take the act of reading for granted. Whether we're glancing at street signs, reading the morning paper, or reviewing e-mail, reading is just one more thing we do as we go about our daily routines. For many children, however, learning to read is far from simple. Results from the National Assessment of Educational Progress (NAEP) indicate that a large percentage of students are not meeting reading standards. In 2003, just 31 percent of fourth-graders, and 32 percent of eighth-graders, performed at or above the proficient level[1] in reading (National Center for Education Statistics, 2004). Among children who are eligible for free or reduced-price lunch, a key indicator of poverty, just 15 percent of fourth graders and 16 percent of eighth graders performed at the proficient level.

Within the current framework of standards-based reform and accountability, all schools and districts are required to ensure that every child can read and understand both literary and informational texts by the end of third grade. For any child, this is no small task. To achieve reading proficiency, students must master certain knowledge and skills at or before critical grade levels. During the primary years (K–2), children need to master the reading fundamentals, such as associating sounds with written words. During the intermediate grades (3–5), children need to develop and use all word identification concepts and skills, as well as comprehension strategies such as recognizing confusion, adjusting one's strategies, and identifying and summarizing main ideas and important details (McREL, n.d.). As children prepare for and progress through middle school and high school, they are expected to develop and use advanced reasoning for reading so that they can understand and interpret texts well enough to take and pass a college-preparation sequence of courses (Committee for Economic Development, 2000).

IN THIS CHAPTER

[1]Three achievement levels have been defined by NAEP (2004):
Basic — Partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade.
Proficient — Solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.
Advanced — Superior performance. (see http://nces.ed.gov/nationsreportcard/reading/achieve.asp)

When children don't master these increasingly complex reading skills on schedule, the negative effects spill over to other content areas. Struggling readers tend to fall farther and farther behind other students, not only in language arts, but in other subjects as well. Research shows, however, that this trend can be turned around. According to Slavin, Karweit, and Madden (1989), "the negative spiral that begins with poor achievement in the early grades can be reversed" (p. 4).



To help students attain proficiency in reading, many educators are considering out-of-school time (OST) strategies and programs. These educators are looking for effective programs to mitigate summer learning loss, remediate skill deficiencies, accelerate learning, and prepare students for the intellectual challenges of later schooling and work. In addition to addressing these academic focuses, OST strategies and programs enable educators to address the safety, behavioral, cultural, vocational, emotional, and social needs of students.

The timeframes for delivering OST strategies include after school, Saturday school, and summer school. The variation among the purposes and formats of these strategies reflects how interventions address the different academic and social learning needs of students. The National Institute on Out-of-School Time "believes that high-quality after-school programs focus on the development of the whole child, integrating academic supports such as literacy skills into programming that also promotes children's social, emotional, and physical development" (Hynes, O'Connor & Chung, 1999, p. 1). Others have emphasized the informality of after-school programs as being well suited to developing the social and cultural dimensions of literacy, such as helping children see how reading and writing can be intrinsically rewarding and relevant to their lives (Spielberger & Halpern, 2002).

Program developers seeking to design or strengthen OST interventions for their struggling students can find some useful guidance from research on the effectiveness of OST programs and strategies. Findings from McREL's analysis of research, for example, point to potentially effective

ways of providing students with instruction and related experiences that can help them advance their reading achievement.

Out-of-School Time Research

McREL, in its review of the research on OST strategies in reading, evaluated five program characteristics to determine their influence on the overall effectiveness of OST programs: (1) timeframe (summer school, after school, Saturday school), (2) grade level, (3) activity focus, (4) program duration, and (5) student grouping. On average, OST strategies improved the reading achievement of participating low-achieving or at-risk students by five percentile points. Although the available research is not definitive, McREL's analysis, as well as guidance from other studies, offers a number of points that OST program developers may want to consider.

Targeting Interventions

Research has long suggested that programs and strategies focused on the prevention of reading difficulties in elementary students are most effective when they are delivered to children early in their schooling, before reading problems become entrenched and self-esteem issues stall the learning process (Mathes, 2003). The same appears to hold true of OST strategies for reading. Programs that target students in grades K–2 show average gains of 9 percentile points (Lauer et al., 2004). Conversely, the gains in achievement for middle school students were minimal, and students in third through fifth grades actually showed declines in achievement. The research also indicates, however, that OST strategies also can have a significant positive impact for students in upper grade levels. High school students seem to reap strong benefits from OST programs; Lauer et al. (2004), for example, found that these students posted average gains of more than eight percentile points. These findings corroborate earlier studies suggesting that younger and older students benefit most from OST programs in reading.

Short-Term Summer School Intervention

Location:
- Ohio

Students served:
- First- through fourth-grade at-risk students

Program components:
- Small-group tutoring
- Phonics instruction
- Computer-assisted instruction

Program outcomes:
- More than six-month grade-equivalent gain in reading proficiency for first graders

Luftig's (2003) report on a 2-week summer reading program illustrates some of the benefits of early intervention. As part of the program, at-risk students entering first through fourth grades engaged in a short-term reading intervention for part of each day. Students participated in small-group tutoring, phonics instruction, and computer-assisted instruction. Participating students were assigned either to the local school district or to a private for-profit

organization specializing in academic interventions for students. Though all of the students participating in the program showed gains when compared to non-participating students, those gains were strongest for first graders, who gained the equivalent of 6.5 months in reading proficiency. These gains may be a reflection of a good match between the content and the critical elementary school period — an important point for program developers to consider.

Though these findings reiterate the importance of early intervention for struggling readers, students in the upper elementary and middle school grades who have difficulty reading should not be ignored. Most research suggests that gains are greatest for younger and older students, but a few programs have shown gains for upper elementary and middle school students. OST developers might turn to these particular programs for guidance in working with students in the middle grades.

An after-school homework assistance program studied by Leslie (1998), for example, which was designed to provide support and assistance to sixth-, seventh- and eighth-grade rural students from poor families in Georgia, showed positive results. This after-school program incorporated a variety of staff and instructional approaches. The activities were led by a group of volunteer tutors, including classroom teachers, paraprofessionals, and middle and high school students. The adult tutors communicated with the students' classroom teachers on a regular basis to ensure the most appropriate use of homework-help time. Tutors had access to computers and software that aided them in meeting the needs of the study participants. The variety of tutors and the variety of methods they used encouraged a level of individualization that the participants would probably not have experienced in their regular classrooms.

Students attended these tutoring sessions for 90 minutes, twice each week. They spent the first half-hour on homework assigned by their regular classroom teachers, and relied on tutors for assistance. The final hour of class was spent reinforcing the reading and mathematics objectives that had been taught to students during

Georgia After-School Program

Location:
- Georgia

Students served:
- Sixth-, seventh-, and eighth-grade rural students from poor families

Program components:
- After-school program
- Volunteer tutors
- Alignment between school-day and after-school work

Program outcomes:
- 31 percentile point increases for sixth- and eighth-graders on standardized tests in reading

the regular school day. Tutors provided assistance to students as they worked on skill development sheets and computer-based activities designed to strengthen their mathematics and grammar skills. Some of the curriculum covered within the program was provided by classroom teachers in the form of lessons and activity sheets. Following their year-long participation in the program, students showed significant gains on standardized test scores in reading: 31 percentile points for both sixth and eighth graders, and 49 percentile points for seventh graders. This middle school program did not fit into the grade span during which OST appears to be most effective, but it did have other characteristics that research has shown to positively influence student learning — for instance, tutoring and computer-assisted instruction.

When developing OST programs, program staff also should keep in mind the importance of implementing a well-defined reading curriculum, in particular one that addresses state standards. One OST study that offers guidance is Hausner's (2000) study of the Project Accelerated Literacy (PAL) program. PAL includes eight major components of literacy instruction, which are modeled on scaffolded learning and a constructivist approach to reading and writing: read aloud to children, shared reading, guided reading, independent reading, modeled writing, shared writing, guided writing, and independent writing. Features of the PAL program include (1) small class size, (2) a variety of learning centers integrating literacy tools and tasks (e.g., play office, art center, cooking, and book corner); (3) a two-hour block of time for literacy instruction using large-group, small-group, and individual instruction; (4) teaching practices based on each student's performance on standards; (5) scaffolded teaching that follows a sequence of modeling, guiding, observing, and practicing skills for students; and (6) a thematic curriculum (e.g., foods, sea life, and community helpers) reflected in each activity

Project Accelerated Literacy (PAL)

Location:
- Not disclosed

Students served:
- At-risk kindergarten students

Program components:
- Eight components of literacy instruction, modeled on scaffolded learning and a constructivist approach
- Small class size
- Variety of learning centers (e.g., play office)
- Two-hour block of time for literacy instruction
- Large- and small-group and individual instruction
- Teaching practices aligned with standards
- Scaffolded teaching
- Thematic curriculum

Program outcomes:
- More than 16 percentile point gain in literacy

center. As a result of this 30-week, half-day program, at-risk kindergarten participants demonstrated a gain of more than 16 percentile points in literacy.

On the upper end of the grade spectrum, Rembert, Calvert, and Watson (1986) evaluated the Summer Camp for Academic Development (SCAD), an academic summer camp for 10th-, 11th-, and 12th-grade students with "evidence of college level academic potential, but low motivation or intention toward postsecondary education" (p. 376). For three to four weeks for each of two to three summers, students lived in dormitories on a college campus, attended classes, used college library facilities, and experienced a college atmosphere. The college preparation classes focused on skill mastery in basic academics and simulated college instruction. Assistance with career planning and study skills instruction also was provided. Compared to nonparticipants, students in this academic summer camp demonstrated higher reading achievement (more than 19 percentile points) and were more likely to enter college. It appears that when college is only an abstract concept, at-risk youth may not be as motivated to achieve academically in order to attend college. But making the notion of postsecondary education real to these students — and giving them the sense that they can be successful — may have increased their motivation to attend college.

Austin Parks & Recreation Dept. After-School Program

Location:
- 20 schools in Austin, TX

Students served:
- Low-income children in grades 3-6

Program components:
- Mixed academic & social components (e.g., gardening, cooking, field trips)
- Emphasized recreation and social time
- Recreational classes enhanced academic skills

Program outcomes:
- 12 percentile point achievement gains in reading & mathematics
- Improved student self-esteem

(Mathematics results for the program are discussed in Chapter 3.)

The freedom and flexibility to address issues such as motivation, and to tailor instruction to specific student needs, may in fact be part of the increasing interest in OST programs. Interestingly, some research recommends similarly flexible approaches to in-school time instruction. For example, in a review of the research on reading programs in general, Allington (2001) recommends that conversations about books take on the characteristics of out-of-school conversations. In out-of-school conversations about reading, participants tend to make connections between books, articles, and other materials and their own experiences.

The value of designing programs and strategies that engage students in learning is that increased time on task can positively affect student achievement.

A Question of Duration

Although it is natural to assume that longer programs produce a larger effect on student achievement, this is not always the case. In fact, programs shorter than 44 hours and longer than 210 hours have been found to result in very small negative effects. The ideal program length for improving reading achievement appears to be between 44 and 84 hours; McREL's analysis found that children participating in OST programs for 44 to 84 hours achieved the greatest gains, a full 10 percentile points. In programs ranging from 85 to 210 hours, the performance increase observed was 7.5 percentile points (Lauer et al., 2004), less than medium-length programs but nonetheless a noteworthy performance improvement.

There are a number of possible reasons for the differences in gains. A program that lasts fewer than 44 hours might not be long enough to fully engage students and influence achievement in reading. It may also be difficult to sustain the conditions that promote student learning over a longer period of time, as indicated by the level of achievement gains found for programs longer than 210 hours. However, although programs more than 210 hours long may in fact be less effective — either because of a loss of focus, attrition of students, or for some other reason — studies indicate that how often students participate in after-school programs can impact student achievement. As OST program developers established the preferred length of their programs, it is important to take these research findings into account.

Baker and Witt's (1996) evaluation of two after-school programs in Austin, Texas for elementary-school children yielded findings that point to the value of high

Summer Camp for Academic Development (SCAD)

Location:

- South Carolina

Students served:

- Tenth-, eleventh-, and twelfth-grade students who exhibited low motivation toward postsecondary education

Program components:

- College preparation classes conducted on a college campus
- Mastery in basic academics emphasized
- Assistance with career planning and study skills

Program outcomes:

- More than 19 percentile-point difference in reading achievement between participants and nonparticipants
- Participants more likely to attend college

(Mathematics results for the program are discussed in Chapter 3.)

levels of participation in OST programs. These after-school programs were aimed at increasing student interest and engagement in learning by presenting academically oriented activities in the context of a goal-oriented, fun, recreational experience. Each of the after-school programs offered a different balance of activities — ranging from primarily academic activities to primarily recreational activities — in a series of multi-week sessions. Students could sign up for one or several activities each session or for several activities. Baker and Witt found that students who participated in three or more activities had higher reading grades than students who did not participate at all; students who participated in five or more activities had higher grades than students who participated in fewer than five activities. In addition to increased participation, other factors, such as the quality of student-staff interaction, may have contributed to the success of these programs. Baker and Witt offer the observation that program leaders "tried to use the after-school activities to provide quality contact time and highlight the linkage between fun and learning" (p. 18). The success of this multi-session program suggests that variety should be a consideration in OST program design.

Summer Literacy Day Camp

Location:
- Los Angeles, California

Students served:
- Exiting first-grade students from predominantly low-income schools

Program components:
- Mix of academic and recreational activities
- Two hours of reading instruction per day, taught by a credentialed elementary school teacher
- Tutoring by volunteers for at least one hour per week

Program outcomes:
- 26 percentile-point gain in reading achievement

Choosing OST Strategies

In a review of extended-day and after school programs, Fashola (1998) recommends that OST program developers "adopt or create well-structured programs that provide extensive training" (p. 53). As part of this process, program developers must consider which research-based strategies are best suited to their students' needs. One-on-one tutoring is one such strategy to consider.

Research shows that working with students one-on-one results in the largest achievement gains, 19 percentile points (Lauer et al., 2004). Schacter's (2001) evaluation of the impact of an eight-week, summer day camp that implemented a systematic reading curriculum illustrates the potential for gains from one-on-one tutoring. The purpose of the camp was to increase reading achievement for disadvantaged first graders. Children received two hours of reading instruction each day; the remainder of each

day was spent in recreational activities such as swimming, arts and crafts, music and dance. Participants showed significant gains in reading improvement — a more than 26 percentile-point increase.

In Morris, Shaw, and Perney's (1990) study of an after-school tutoring program, 60 low-achieving second and third graders were randomly assigned to either after-school tutoring or a control condition of no tutoring. The after-school tutoring was provided for one year by community volunteers who were supervised by reading specialists. The supervisors designed each tutoring lesson, and the tutors implemented the lessons and recorded their observations for the supervisor who, in turn, designed subsequent lessons. Tutorial strategies included shared reading, word study, reading books, and writing stories. Attaining the overall positive effect of after-school tutoring on reading achievement (a 19 percentile-point gain) required 50 hours of "well-planned, closely supervised one-to-one tutoring" (p. 147).

Notably, each of these strategies has at its core a focus on differentiating instruction. One benefit of OST programs may be that they provide the time and flexibility needed to accomodate students' different learning styles and academic and developmental needs.

The Howard Street Tutoring Program

Location:

- Chicago, IL

Students served:

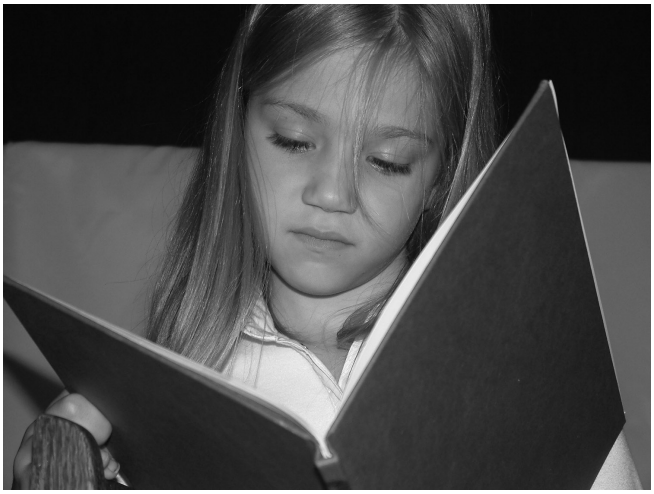
- Low-achieving second and third graders

Program components:

- Year-long, after-school tutoring program
- Community volunteers served as tutors, supervised by reading specialists
- Tutorial strategies included shared reading, word study, reading books, and writing stories

Program outcomes:

- 19 percentile point gain in reading achievement



Sustaining Gains Over Time

Some studies aimed at identifying strategies for closing the achievement gap indicate that OST strategies can be effective at preventing learning loss among low-achieving students, especially during the summer months. In fact, Borman, Rachuba, Fairchild, and Kaplan (2002) reported a cumulative impact on the learning of kindergarten and first-grade students in summer school over a period of two and three years.

In contrast, other studies have found that students did not sustain learning gains over time. For example, Hausner's (2000) evaluation of the PAL after-school kindergarten literacy program reported that low-performing students' literacy scores increased significantly (by more than 16 percentile points) but that these students did not show sustained improvement in the second grade. The author suggested that at-risk students may need more than one literacy intervention to retain the gains made as a result of the early intervention program.

Key findings

Research indicates student gains are greatest when reading-based OST programs

- ☑ Offer one-on-one tutoring or mixed student groupings
- ☑ Range from 44–84 hours
- ☑ Focus on early elementary & high school students

Implications for Program Developers

McREL's analysis of the available high-quality research reveals an overall tendency for improved reading achievement among low-achieving or at-risk students who participate in OST programs. This suggests that policymakers and practitioners should consider OST programs as a promising option for boosting the reading achievement of these student groups. Based on the body of research on OST strategies in reading, some conclusions can be made related to program design and effective practice.

Most notably, the following OST strategies and characteristics appear to be effective in improving the reading achievement of low-achieving students:

- Tutoring and mixed student groupings
- Programs between 44 and 84 hours in length
- Programs that focus on early elementary and high school students

As program developers consider how best to meet the needs of their at-risk students, these findings should be kept in mind.

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CHAPTER 3

Effective OST Mathematics Programs

Proficiency in mathematics is a critical life skill. Mathematics knowledge, as well as essential problem-solving and reasoning skills, are essential for success in many business and technical careers, and support a host of other endeavors as well. In many cases, however, our nation's students are not learning these skills: just 32 percent of fourth graders and 29 percent of eighth graders performed at or above the proficient level in mathematics on the 2003 National Assessment of Educational Progress (NAEP). The picture is more dismal for at-risk students: at both grade levels, students from low-income families scored significantly lower in mathematics than their more wealthy counterparts (National Center for Education Statistics, 2004).

What kinds of mathematics knowledge and skill are required of students? NAEP assessments evaluate students' conceptual understanding, procedural knowledge, and problem-solving skills within five broad strands of mathematics content: number sense, properties, and operations; measurement; geometry and spatial sense; data analysis, statistics, and probability; and algebra and functions (National Center for Education Statistics, n.d.).

The National Council of Teachers of Mathematics (NCTM) has created a set of standards that outline the content and processes that children should know and be able to do across grade bands. For instance, the "number and operations" standard states that children should understand numbers, ways of representing numbers, relationships among numbers, and number systems. In the prekindergarten through the second grade band, for example, this means that children should count with understanding and understand and represent commonly used fractions, among other skills (NCTM, n.d.).

In addition, the National Research Council identifies five interdependent and necessary "strands" of mathematical proficiency:

- Understanding: Comprehending mathematical concepts, operations, and relations — knowing what mathemati-

IN THIS CHAPTER

cal symbols, diagrams, and procedures mean.

- Computing: Carrying out mathematical procedures, such as adding, subtracting, multiplying, and dividing numbers flexibly, accurately, efficiently, and appropriately.

- Applying: Being able to formulate problems mathematically and to devise strategies for solving them using concepts and procedures appropriately.

- Reasoning: Using logic to explain and justify a solution to a problem or to extend from something known to something not yet known.

- Engaging: Seeing mathematics as sensible, usable, and doable — if you work at it — and being willing to do the work (Kilpatrick & Swafford, 2002, p. 9).

The NAEP and National Research Council frameworks, and the NCTM standards, all illustrate the importance of bringing students to deep levels of learning and understanding in mathematics. To help students achieve this degree of proficiency and understanding, many schools are exploring new mathematics curricula and providing teachers with the professional development necessary to enhance their ability to teach students with a broad range of needs. For at-risk students, however, these in-school efforts may not be enough. Many of these students need more time and personalized attention than that available during regular school hours. Many schools and districts are turning to out-of-school time (OST) programs for solutions.

Though the research on OST mathematics programs is still emerging, there are a number of key findings for program developers to consider. This chapter presents those findings, along with other guidance and information about enhancing the mathematics achievement of at-risk students.

Overview of Research on Out-of-School Time Mathematics Programs

Do OST programs make a difference in mathematics achievement — and if so, how do they make a difference? The available research offers guidance for educators on both counts. McREL's review of 33 OST program studies found that, on average, at-risk students who participated in OST programs scored more than six percentile points higher on mathematics achievement tests than students who did not participate (Lauer et al., 2004).

At first glance, six percentile points might seem to be a small increase, but all OST programs are not created equal. Some program characteristics seem to lead to greater impacts on student achievement than others. Specifically, McREL found that the following program structures and characteristics resulted in the largest gains in student achievement:

- Programs that combine mathematics instruction and social activities

- Programs that last between 45 and 100 hours
- Programs for middle school students
- Programs for high school students

These results offer some interesting points for program developers to consider. By more closely exploring the programs that resulted in larger effects on student achievement, schools may be able to maximize the effects of their OST programs.

The Value of Social Activities

Programs outside the typical school day that focus solely on academics are not the only way, or perhaps even the most effective way, to improve students' mathematics achievement. A number of studies point to the value of weaving social activities and life-skills instruction into OST programs. For example, Branch's study (1986) of the Summer Education and Training Program (STEP) reported strong mathematics gains among participating students. Between 1984 and 1991, STEP served 20,000 adolescents in five urban locations across the nation. The program was added to an existing federally funded summer-jobs program, the Summer Youth Employment and Training Program (SYETP), which served disadvantaged 14- and 15-year-olds. Branch notes that SYETP "had only limited success in helping [participants] make successful transitions into the world of work" (p. ii), so STEP was created to help bridge the gap. Program components included academic remediation, life-skills instruction, summer employment, and support during the regular school year.

STEP Program

Location:
- Five urban locations across the nation

Students served:
- Disadvantaged 14–15 year olds

Program components:
- Academic remediation
- Life-skills instruction
- Summer employment
- Support during regular school year

Program outcomes:
- Initial participants outscored peers by 1/4 grade equivalent in reading & mathematics
- Academic effects relatively short lived

STEP's 15-month timeframe spanned two summers and the interim school year. Participants divided their summers equally between working and learning. Each student held a part-time job for approximately 90 hours, and spent the same amount of time in remediation classes. Participants also took part in a life-skills class that met two mornings each week. Over the summer, participants received highly individualized, computer-assisted instruction in reading and mathematics. Program teachers kept track of student progress through a variety of diagnostic tests that were closely aligned to program goals. The life-skills program component addressed students' social needs through a wide range of instructional formats — including speakers, discussion,

and creative activities. These classroom components were designed to complement the existing summer jobs program that provided participants with office, parks and recreation, or custodial minimum-wage work.

Researchers suggested the STEP program was ineffective at providing a school-year component to support lasting academic gains.

The first group of participants in STEP made impressive gains, outscoring their peers by approximately one-quarter of a grade equivalent in both reading and mathematics. A later study of the program, however, found the academic effects to be relatively short lived (Grossman & Sipe, 1992). The researchers suggested that the STEP program had been ineffective at providing the planned school-year component to support lasting academic gains — perhaps an important cautionary note for program developers to consider. If, in fact, this program did not result in sustained achievement gains because students did not receive additional help during the school year, this emphasizes the need to provide ongoing help to students at risk of failure.

In another program, children participating in after-school sessions administered by the Austin Parks and Recreation Department and the Austin Independent School District (Baker & Witt, 1996) realized achievement gains of 12 percentile points in reading and mathematics. Outcomes other than academics were measured as well; student gains were evident not only in reading and mathematics, but also in students' self-esteem. This after-school program served third- through sixth-grade children from 20 schools in low-income communities. In addition to household income levels, the communities featured in Baker and Witt's (1996) evaluation exhibited other risk factors. These included lower levels of per capita income, higher rates of unemployment, higher percentages of families with children under 18 living below the poverty level, higher rates of Spanish spoken in the home, and lower rates of high school graduation.

Classes and activities in the Austin program were taught by teachers who received additional pay to take on the task, as well as instructors hired by the Austin Parks and Recreation Department. The classes were free to participants; children were accepted on a first-come, first-served basis. The program mixed academic and social components in a variety of classes.

In a class with an agricultural focus, for example, students learned about gardening and cooking in hands-on sessions that touched on academic areas such as the earth sciences and measurement. Another class, the Explorers, provided opportunities for students to learn about and see firsthand a variety of animal and plant life that are not typically encountered in the Austin area. Class activities included field trips to local zoos, parks, and to the seashore.

The Austin program also offered classes that emphasized recreation and social time, leveraging, for example, students' interest in sports, Hispanic culture, and creative activities, such as learning to be a clown. Even these recreational classes had an eye toward academics, however. For example, a magic activity was designed to enhance mathematics skills, and sports classes included the calculation of sports statistics.

Though adding social components to OST mathematics programs appears to be effective, the underlying academic content must be paired with effective instructional strategies. For example, is the program comprehensive and aligned with state- and national-level standards? Does the program focus on conceptual understanding, as well as procedural fluency? Does the program include well-developed ideas that build on other concepts within and across grades? Do program instructors have a deep understanding of the subject matter (Apthorp et al., 2001)? Though these considerations are not specific to OST programs, it is critical that program developers examine a wide range of research before making decisions about program structures and content.

Programs That Are Just the Right Length

As was the case with the reading research, McREL found in its review of OST mathematics programs that duration is one indicator of program effectiveness. Programs providing fewer than 45 hours of total intervention time appear to result in less of an impact on student achievement than those ranging from 45 to 100 hours (Lauer et al., 2004).

Programs ranging from 45 to 100 hours appear to be most effective.

One such program is described by Kociemba (1995), who examined the impact of the 1988 Minneapolis Public School Summer Program on student achievement in mathematics and reading for children in second and fifth grades. The students participating in the program had either failed the Minneapolis Public School Benchmark Test in reading and mathematics, or were performing well below grade level and were recommended to the program by a teacher or counselor. Students attended 24 days of summer school, for four hours per day. Instruction focused on reading comprehension and mathematics computation skills, and included both small group and individualized instruction.

Following their participation in the program, both second and fifth grade students showed gains in mathematics achievement on a standardized test. Second-graders made

Minneapolis Public School Summer Program

Location:
- Minneapolis, MN

Students served:
- Grade 2 & 5 children failing state test, performing below grade level, or recommended by teachers or counselors

Program components:
- 24 days of summer school, 4 hours/day
- Small group & individualized instruction focused on math computation skills

Program outcomes:
- 2nd graders made 3 percentile point gains
- 5th graders made 15 percentile point gains

gains of approximately 3 percentile points; fifth graders made gains of 15 percentile points.

As educators develop new OST programs, there are a number of things to keep in mind in terms of program duration. Although programs ranging from 45 to 100 hours appear to be most effective, it is up to the program developers to determine which program duration is most appropriate for their schools. Program developers might prefer, for instance, to develop a series of shorter interventions rather than one longer, sustained program. There is some research to support the utility of this approach. The program evaluated by Baker and Witt (1996), for example, describes schools that divided their interventions into three or four 6- to 9-week sessions, resulting in significant achievement gains. Though shorter programs may require more logistical support — designing different approaches, assigning students to classes, identifying and training staff — they also have the potential to be more exciting and engaging for students.

Effective Middle and High School Programs

The available research on mathematics programs for at-risk students uncovered unexpectedly large effects in middle and high schools. Middle school programs, on average, produced a 6 percentile-point gain in achievement, and high school programs produced an average 17 percentile-point gain. Although research does point to effective elementary school mathematics programs, more examples are available of effective OST programs for students at middle school and high school levels. This prevalence of math-focused OST programs for older students may simply be a function of the relative complexity of mathematics (e.g., pre-algebra, algebra) in the middle and high school curricula. Also, this emphasis may reflect the structure of middle and high

Middle school programs, on average, produced a 6 percentile-point gain in achievement, and high school programs produced an average 17 percentile-point gain.

schools, where students must repeat failed courses before moving on to the next level of mathematics. Middle and high school students are also under increased pressure to prepare for college. The focus of the research to date may be a reflection of these students' needs.

One example of a program for older students is the Summer Camp for Academic Development (SCAD), in which a population of at-risk students was identified and participated in a summer academic program (Rembert, Calvert, & Watson, 1986). This program was a grant-supported program on the Winthrop College campus, located in Rock Hill, South Carolina. Participants were a group of African-American high school students who had the academic potential to succeed in college, but who were unlikely to enroll — either because of a lack of motivation or because of socioeconomic factors. Students from central South Carolina traveled to Winthrop College for four summers in the 1980s, and attended several weeks of college classes.

Students participating in SCAD engaged in study throughout the school day on the Winthrop campus. From Monday through Thursday, their schedules were filled with classes encouraging interest and mastery in core subjects including reading, writing, mathematics, and science. The classes, which were taught by public school teachers and graduate students, incorporated approaches such as computer-assisted instruction, science laboratory work, and library research in an effort to acclimate the participants to college coursework.

Fridays and Saturdays were reserved for seminars and field trips. Seminars were led by Winthrop counselors and focused on career opportunities, study skills, and self-esteem. These issues were reinforced by adult mentors assigned to participants, who served as role models for professional success and community leadership. These African American adults were not only able to speak to participants about the career

Summer Camp for Academic Development (SCAD)

Location:

- Winthrop College, Rock Hill, SC

Students served:

- High school students who exhibited the potential for college success

Program components:

- Summer classes on college campus
- Encouraged interest & mastery in core subjects (reading, writing, math, science)
- Incorporated computer-aided instruction, science labs, library research, field trips

Program outcomes:

- 13 percentile point gain in mathematics achievement
- 69% of participants enrolled in college

paths — business, finance, law, medicine — in which they had achieved success, but they were also able to address the challenges they faced along the way. Most of participants' field trips exposed them to local industries and businesses, thereby enriching the career focus of the program.

The college experience was a complete one for these students. Beyond the classes and class activities, while on campus the participants had access to a variety of college services, including the sports and recreation facilities, the student center, computer labs, and even the guidance of college professors and administrators. The participants also got a taste of dorm life, calling the Winthrop dorms "home" during their three or four weeks on campus.

Rembert et al.'s evaluation of the SCAD program reported a 13 percentile-point gain in students' mathematics achievement. In addition to enhancing African American students' skills and fostering their interest in academics, the SCAD program also was successful in its primary goal: to encourage students to go to college. In the years that followed, 69 percent of program graduates enrolled in college, a quarter of them in Winthrop. Many program graduates also went on to earn degrees and graduate degrees (see sidebar).

The SCAD program is not the only program of its type. Another example of a summer college program for urban high school students is the Twenty-first Century Mathematics Center for Urban High Schools at Temple University. The program offered algebra, geometry, and functions classes that served at-risk students. Participants were students from a public magnet school who enrolled in math

FROM THE FIELD: THE SUMMER CAMP FOR ACADEMIC DEVELOPMENT PROGRAM

"Several of the participants of SCAD went on to pursue graduate studies here at Winthrop and/or elsewhere and are doing quite well. I cannot tell you how proud I am of their individual and collective successes. Almost all of them were first generation college students who, when given the opportunities to demonstrate their academic potential, readily accepted and demonstrated their gifts and talents. Who in the mid-80s would have predicted that these students from rural South Carolina with limited access to higher education would be bankers, counselors, and sophisticated investors today? Perhaps, many in their respective families or communities knew they had potential, but did not realize the absolute jewels they were and are. They shine so very brightly today."

Wilhelmenia I. Rembert, Ph.D.
Associate Vice President
Graduate Studies, Winthrop University

classes designed for the program and offered by Temple.

Evaluations of the program indicated that participants showed significant gains in mathematics achievement — a 34 percentile-point gain for female participants and a 30 percentile-point gain for males (Riley, 1997). The Temple program differed from the SCAD program in a number of ways. Participants in the Temple program listened to a topic lecture and then completed both in-class and take-home worksheets. Lectures were followed by in-class tasks and homework assignments that were supported by available graduate student and program graduate tutors. To help participants meet the expectations for the amount of content and the level of mastery expected, graduate students and program graduates provided small-group and individual tutoring before, during, and after classes.

In addition to grade level, the SCAD and Temple programs share another distinguishing characteristic worth noting. In each case, the program designers were focused on meeting the needs of at-risk students who not only may have had trouble with complex concepts, but who also struggled with motivational issues. These two programs emphasized teaching core subjects and building students' confidence in their ability to succeed. Though the approaches taken by these two programs were different, the results were quite similar. In each case, the large effect sizes appear to indicate that the programs were successful in helping students recognize that they were able to master complex material under pressure. In the SCAD program this pressure was a result of the heavy class load, whereas in the Temple program this pressure was the product of the pace of the courses. But, in both cases, the students appear to have left the programs with the confidence of knowing that they can succeed.

Twenty-first Century Mathematics Center for Urban High Schools

Location:
- Temple University, Philadelphia, PA

Students served:
- At-risk urban high school students

Program components:
- Summer college program
- Math (algebra, geometry, & functions) classes taught by university faculty
- In-class lectures, take-home worksheets
- Graduate students & program graduates served as tutors
- Focused on both academies and building student confidence in ability to succeed

Program outcomes:
- 34 percentile-point gains for females
- 30 percentile-point gains for males

Implications for Designers of OST Mathematics Programs

McREL's review of the research yields a number of considerations for OST mathematics program developers to keep in mind. The research indicates that gains for OST program participants were greatest for programs that combine mathematics and social emphases, programs that range between 45 and 100 hours, and programs that target middle and high school students. These findings offer a starting point for developers of new OST mathematics programs.

As staff go about developing OST programs in mathematics, it is important to ensure that appropriate research-based strategies are in place to maximize their impact and the potential for long-term student performance gains. The Kociemba (1995) study described in this chapter offers an interesting illustration of a successful OST program. This program addressed what appears to be a key element of OST program success — duration. This program also incorporated tutoring and aligned the after-school program to the school-day curriculum, which may well have had an additional impact on its success.

The programs examined in this chapter have important characteristics in common: each had high expectations for participants, and provided the instruction and supports necessary for students to be successful. If OST program developers provide these supports, incorporate research-based strategies for instruction, and keep in mind the other factors that have been shown to impact participant achievement, their programs have a greater potential to positively influence student achievement.

Key findings

Research indicates student gains are greatest when math-based OST programs …

- ☑ Combine math & social emphases
- ☑ Range from 45–100 hours
- ☑ Target middle & high school students

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CHAPTER 4

Moving Forward: Developing and Administering OST Programs

Though out-of-school-time programs have been a part of our nation's history since as early as the 1800s, for a long time these programs were viewed as merely providing childcare or social activities. Only recently have educators begun to look to them as a means for helping all students meet high academic standards. Perhaps in part because of this recent shift in focus, the research on these programs is not yet definitive. Nonetheless, McREL's review of the available research reveals a few key points for administrators involved in the design and implementation of programs beyond the traditional school day:

The timeframes for delivering OST programs (e.g., after school, summer school) do not appear to influence the effectiveness of OST strategies. Policymakers and educators should look at other factors — for example, program duration and cost, as well as staff recruitment, program location, and other implementation issues — when making decisions about the delivery of programs outside the traditional school day. What matters is not when the programs are implemented, but how they are implemented.

Students in early elementary grades and in high school are more likely than older elementary and middle school students to benefit from OST programs to improve reading. However, middle and high school students are most likely to benefit from OST programs in mathematics. The findings for reading achievement in part support prior research on the importance of early intervention and reading skill development; the results for mathematics suggest that students who struggle with complex subject matter can make significant achievement gains through the extra help provided in OST programs.

OST programs need not focus solely on academic activities to have positive effects on student achievement. Study results indicate that OST programs in which activities are both academic and social can positively influence student achievement. This finding supports the belief that OST programs should address the developmental needs of the whole child (Halpern, 2002) and offer a variety of activities (Miller, 2003). However, the results also suggest that effectiveness related to program focus may vary depending on grade level and content area.

Administrators should monitor student learning and the implementation of OST programs to determine the appropriate investment of time for specific strategies and activities. Al-

though McREL's synthesis indicates that OST programs need to be at least 45 hours long to be effective, longer OST programs do not necessarily lead to additional gains. The optimal length of a program may depend on the content area and other factors. This result supports other findings that extending the time for learning does not mean that students will be engaged in learning during that additional time (WestEd, 2002).

OST reading strategies that provide one-on-one tutoring for at-risk students can lead to particularly strong results in terms of student achievement. This was one of the strongest findings from McREL's meta-analysis and is supported by other research on tutoring of at-risk students during the school day (Barley et al., 2002; Elbaum et al., 2000). OST programs that have reading improvement as a goal should provide individual tutoring of students.

These findings are not intended to serve as the last word on OST programs, but do offer educators points to consider as they work on the design and implementation of these programs. Part of the appeal of OST programs may well be their flexibility. The importance of good program design is paramount. When working with students outside the traditional school day, educators have more leeway to incorporate one-on-one tutoring and other strategies that positively impact student achievement. OST programs can help us, as educators, move closer to our primary goal: focusing our collective attention and resources on ensuring that every child graduates from high school prepared for success in life, work, and future education. The recommendations in this issue of *Noteworthy* are intended to provide guidance for educators as they work toward that goal.

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Checklist for Program Developers: Things to Consider

What resources (time, space, funding, staff) are available that could be used in providing OST programming?

Are there existing resources (technology, district funding, local businesses or attractions, people with unique talents, unscheduled facilities) that can be tapped?

Who are the students you would like to participate in your OST program?

Are students' needs consistent with program goals?

Will your program need to diagnose individual needs and prescribe appropriate instruction?

What methods will you use to engage, interest, and motivate your at-risk student participants?

Consider not only what approaches might be most effective for specific age groups, but also what might be most appealing to different age groups. Given the competing demands for their time and attention, programs must be engaging to student participants.

What would you like these students to learn as a result of their participation? Clearly articulate your learning goals, and align them with the goals of the school.

In what ways can your OST program enhance the participants' in-school experience?

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