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ABSTRACT

American public schools historically have used a range of differentiating mechanisms to meet the needs of diverse groups of students. Examples from Title I service delivery include pullout, in-class, add-on, and replacement programs. These models have elements that differentiate the educational experience of Title I students to varying degrees and in different ways. Research was done to explore the nature of Title I organization differentiation; relationships between organization differentiation and educational opportunity, classroom social/educational environment, and student psychological status; and the relationship between organizational differentiation and student achievement. Statistical results on a sample population of 12,012 students nationwide in grades 1, 3, and 7 for the 1992-93 school year revealed substantial uncertainty about organizational differentiation and its effects on student learning opportunities. There is lack of compelling evidence about the effectiveness of Title I programs and little consensus about which Title I program models hold the most promise for improving student achievement. Title I pullout programming was generally associated with reduced learning opportunities. There were inconsistent relationships between organizational differentiation and student psychological status and classroom environment ratings. The lack of evidence for the effectiveness of particular Title I programs and instructional models underlines the importance of continued research in this area. (RT)

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Understanding the Impact of Organizational Differentiation in High-Poverty Schools with Alternative Models of Title I Service Delivery

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Introduction

Historically, American public schools have used a range of differentiating mechanisms to meet the needs of diverse groups of students. Over the past century, as public school systems have become larger and have served an increasingly diverse group of students, a range of structural mechanisms have been developed to most effectively and efficiently administer school resources. These structural mechanisms have produced various types of organizational differentiation, which has been characterized as "the division of a school's student body into subgroups of a relatively permanent character for instructional purposes" (Sorensen, 1970, p. 355). Some forms of organizational differentiation are nearly ubiquitous in American schools, such as the assignment of students to grades and classrooms. Other forms of differentiation are also integral components of many school settings, such as instructional grouping and tracking, and compensatory education initiatives such as Title I, special education, and limited-English proficiency programs.

Over the past three decades, a central and prevalent form of organizational differentiation in public schools has been brought about by federal compensatory education funding for educationally-disadvantaged students. Since its passage in 1965, Title I of the Elementary and Secondary Education Act has provided supplementary resources to schools with large numbers of low-income students. Legislative mandates, requiring that Title I services be provided only to students who qualify to receive them, have motivated schools receiving Title I funds to develop administrative structures that deliver services to Title I participants categorically, more or less distinctly from the core curriculum of the school.

Recent Title I policy initiatives, however—driven in part by concerns about the negative consequences of organizational differentiation—have sought to reduce categorical service delivery approaches in schools that serve a high concentration of low-income students. Although these recent policy initiatives are predicated in part on the assumption that reducing differentiation will benefit students, research on organizational differentiation within schools has yielded mixed results. There remains no clear understanding of the consequences of differentiation and the mechanisms through which they affect student learning. Ongoing concerns about its consequences and recent efforts to reduce organizational differentiation provide a strong motivation for exploring these consequences and the mechanisms through which they are effected. Although research has documented aspects of the relationship between organizational differentiation and student learning, an integrated model that considers a full range of possible mediating effects has yet to be fully examined.

This paper, drawing upon analyses of data from *Prospects: The Congressionally-Mandated Study of Educational Growth and Opportunity*, provide evidence to better understand: 1) the extent and nature of organizational differentiation in schools with Title I programs under different models of service delivery; 2) the consequences of organizational differentiation in schools with Title I programs, with particular attention to implications for a) differences in resource allocation and b) consequences for students' classroom social/educational environment and psychological status; and, 3) the extent to which organizational differentiation affects student achievement and the mechanisms through which effects on learning might be brought about.

Given that compensatory education and other forms of organizational differentiation remain prevalent in American schools and are likely to persist, a better understanding of the particular mechanisms through which they affect learning is needed. In particular, an exploration

of the effects of organizational differentiation on learning in Title I schools with differing service delivery models will better inform an understanding of those circumstances that minimize or exacerbate the positive and negative effects of organizational differentiation.

A Short History of Title I Service Delivery

Since its inception, the central goal of compensatory education at the federal level has been to provide supplementary funds to schools that serve low-income and educationally deprived students. Schools that receive federal Title I resources have long been driven by the need to comply with provisions for fiscal accountability. A series of regulatory and enforcement efforts, dating to the early years of the Title I program, has sought to ensure that funding is used to target compensatory education services toward the intended population of low-income, educationally disadvantaged students (Peterson, Rabe, & Wong, 1988). A major consequence of this regulation has been the tendency of Title I schools to use categorical or "targeted assistance" service delivery approaches as a means to demonstrate compliance with Title I regulations. To ensure that federal Title I resources reach the intended population, for example, Title I schools have typically removed eligible students from their regular classrooms and placed them in supplementary, remedial sessions for part of the school day. Title I programs using this approach are commonly referred to as Title I "pullout programs." This strategy for Title I service delivery has widely affected the organization, instruction, and curriculum of schools serving disadvantaged students (Borman et al., 1999).

Despite accountability measures developed to ensure that Title I services are targeted to those students who need them most, most schools have nonetheless enjoyed some flexibility in how to deliver services. Thus, in addition to pullout programs, other models for Title I service delivery have been developed and implemented, and most Title I schools provide more than one simultaneously (Millsap et al., 1993). In addition to *pullout programs* (which remove student from their regular classroom for intensive remedial instruction), Title I schools have used: *inclass programs* (which provide small group or individualized instruction to Title I students in the regular classroom for less than 25 percent of their overall instructional time); *add-on programs* (which provide instruction before or after the school day, on weekends, or during the summer); and *replacement programs* (in which students spend more than 25 percent of their total instructional time outside of their regular classroom). Across all of the models that distinguish what is provided to Title I students, there has been an emphasis on remedial, basic skills instruction.

Each of these models for Title I service delivery has elements which differentiate the educational experience of Title I students to varying degrees and in different ways and has therefore raised concerns about possible negative effects of organizational differentiation. These concerns coupled with mixed evidence about the historical effectiveness of Title I programs (Borman & D'Agostino, 1996), have led to an increasing emphasis on whole-school reforms.

In recent years, researchers and policy analysts have directed substantial attention to program redesign at the school level in ways that are intended to strengthen the schools' overall organizational capacity to develop more comprehensive strategies for helping disadvantaged children (Wong & Wang, 1994; Millsap et al., 1992; Commission on Chapter 1, 1992). These general trends, along with critiques of the quality of Title I curriculum (e.g., Doyle, 1986; Calfee, 1986; Romberg, 1986; Passow, 1988), contributed to the development of legislative provisions in

1988 and 1994, which encouraged schools and districts to use Title I funds to develop and operate schoolwide programs. By establishing a schoolwide program, a school may coordinate resources between Title I and regular instructional programs for all students in schools that serve large numbers of disadvantaged students. This recent policy emphasis on Title I schoolwide programs represents a focus on improving entire schools, an increased emphasis on coordinating resources in schools for all students, and increased and uniform performance expectations of all students. These regulatory changes are intended to reduce the historically fragmented or categorical character of Title I programs and to improve the effectiveness of entire schools rather than targeting services to meet the needs of the most disadvantaged subpopulations.

This new focus represents a substantial shift in emphasis for Title I schools and has significant implications for the ways that schools deliver instruction to low-income and educationally disadvantaged students. Despite the rapid expansion of schoolwide programs, however, there is little known about the nature of schoolwide programs, the extent to which they have reduced organizational differentiation, and their effectiveness relative to traditional Title I programming (Wong & Meyer, 1998).

Implications of Organizational Differentiation for Student Learning

During the past three decades, Title I programming has been an integral component of American education for disadvantaged students. In recent years, the Title I program is estimated to have reached over twelve million children per year and has provided funds to an estimated three-fourths of all elementary schools and one-half of all middle and secondary schools (Sinclair & Carroll, 2000; Puma et al, 1997). By mandating that schools use federal Title I funds categorically, targeting them to only the students who qualify to receive them, the Title I program has had a profound impact on the ways that many American schools have organized instruction for low-income students. The predominant model remains the pullout model, in which students are removed from their regular classroom to receive Title I services from a specialist instructor in a separate setting. A central consequence of many categorically-arranged Title I programs is that schools differentiate what they provide to Title I participants and non-participants to comply with these mandates which condition the use of categorical Title I funds.

Indeed, a central and persistent challenge to American education is to meet the needs of diverse groups of students who differ according to race, gender, ethnicity, language, social class and ability (Grubb, 1995; Secada et al, 1996). Various forms of instructional grouping have been characterized as logical responses to the problem of how to instruct diverse groups of students, permitting teachers to more readily adapt instruction to student characteristics (e.g., Dreeben, 1984; Barr, 1975). Despite the fact that Title I programs and other approaches to group students for instruction remain prevalent, the efficacy of grouping practices remains highly contested, with research suggesting little conclusive information about the ways in which they influence student learning.

Findings accumulated from years of research on student grouping for instruction suggest that the overall relative efficacy of the student grouping for instruction is small. However, studies comparing progress for different groups of students have suggested different outcomes for groups of low- and high-ability students, even after controlling for student characteristics that might otherwise explain differences (Findley & Bryan, 1971; Kulik & Kulik, 1982, 1984; Slavin, 1990). Many studies that have compared the achievement of students in low- and high-ability

groups have found that--after controlling for measures of intelligence, socioeconomic status, and prior ability--students in high-ability groups gain significantly more than those in low-ability groups. In general, these studies have suggested benefits of instructional grouping for high-ability students and detrimental or no effects for low-ability students (e.g., Gamoran & Berends, 1987; Borg, 1965; Gamoran & Mare, 1989; Alexander, Cook, & McDill, 1978).

Other research on the effects of grouping students for instruction has focused on two primary consequences that may affect student outcomes: 1) student learning opportunities, including exposure to curricula and instruction and access to teaching staff and, 2) consequences for students' a) classroom social and educational environment and, b) psychological status.

Student learning opportunities are affected by differences in curriculum, instruction, and access to qualified and experienced teaching staff. Perhaps most central among the purported advantages of homogeneous student grouping is that the practice allows teachers to better prepare and deliver instruction to students who share the same level of ability and progress at the same rate (Barr, 1975). Despite the promise of instructional grouping for tailoring instruction to student needs, concerns have been raised about its potential to limit opportunities for low-achieving students (Braddock, 1990; Braddock & Slavin, 1993; Rosenbaum, 1976). Although the tendency of Title I programs to focus on basic skills is based on the assumption that remedial skills are necessary precursors to the development of more advanced skills (Burnett et al., 1994; Commission on Chapter 1, 1992), a focus on instructional time spent covering basic reading and math skills may limit student opportunities for students to engage in non-remedial work in these or other subjects (Burnett et al., 1994; King, 1990a). A related concern is that teachers may make instructional choices about what to provide students in low-ability groups, based on estimations of student motivations or a desire to maintain classroom order (Talbert, McLaughlin, & Rowan, 1993).

Not surprisingly, a substantial body of research suggests that the quality and quantity of instruction has an effect on student learning (Barr & Dreeben, 1983; Slavin, 1990; Barr, 1975; Evertson, 1982; Gamoran, 1989; Oakes, 1985; Trimble & Sinclair, 1987). Evidence of strong instructional effects, however, has not been consistent across studies that examine instructional factors as mediators of the relationship between instructional grouping and achievement (Alexander & Cook, 1982; Rowan & Miracle, 1983; Gamoran, 1986; Barr, 1974).

In addition to their being arranged as distinct from regular classroom instruction (e.g., through pullout programs), Title I programs have also often relied on distinct, specially-trained instructors. Advocates of instructional grouping argue that, in addition to catering curriculum and instruction to student needs, instructional grouping also allows for matching students with teachers who have specialized training or experience best suited to their needs. Conversely, others argue that teachers must have a broad range of skills and knowledge to lead students in learning advanced curricula (Talbert, McLaughlin, & Rowan, 1993). Empirical studies of the relationship between teacher characteristics and student learning, however, have yielded no conclusive understanding (Meyer, 1978; Averch et al., 1972; Dunkin & Biddle, 1974). Because there is some evidence that aspects of teacher skill and experience determine how quickly students progress, however, the characteristics of Title I instructors relative to regular classroom instructors may be important—particularly given evidence that low-ability students are often assigned to less experienced or less-educated teachers (Hanushek, 1997; 1972; Murnane & Phillips, 1981; Lindle, 1994; Winn & Wilson, 1983).

Beyond the differentiation of curriculum, instruction and teaching resources, organizational differentiation may also have consequences for the social and educational

environments and the psychological status of students in categorical programs and other grouping arrangements. Homogenous instructional groups may allow low-ability students to learn in an environment in which they are less likely to be self-conscious or discouraged by their inability to achieve at the level of other, higher achieving students (Lindle, 1994). Despite this intent, however, opponents of instructional grouping maintain that the practice: 1) fosters achievement inequities among students (Bowles & Gintis, 1976; Braddock, 1990; Rosenbaum, 1976; Oakes, 1981); and 2) discourages interaction among students of different groups (Johnson & Markle, 1983).

Evidence that low-ability groups tend to be more homogeneous than high-ability groups (Hallinan & Sorensen, 1983; Bidwell & Friedkin, 1988; Cohen, 1983; Kandel, 1978) has raised concerns that low-ability students may not have the same exposure to peers with strong academic motivations and can be deprived of the example and stimulation provided by students with high educational aspirations. Research has also suggested that instructional time is lost in low ability groups because more time is devoted to disciplinary issues (Eder, 1981; Oakes, 1981) and because students spend more time in non-instructional activities (Evertson, 1982).

Instructional grouping may offer opportunities for low-ability students to develop in less-competitive environments, sparing them from self-consciousness and embarrassment associated with low ability (Slavin, 1987). Research has shown that grouping arrangements that match students' ability allow students to develop more positive attitudes toward schooling (Kulik & Kulik, 1982), enhancing their self-esteem (Goldberg, Passow, and Justman, 1966; Newfield & McElyea, 1983) and leading to higher achievement expectations (Alexander & McDill, 1976). Other research, however, has documented negative consequences of ability grouping on students assigned to low groups, focusing on effects on student motivation and self-esteem (e.g., Cottle, 1974; Schafer & Olexa, 1971; Reuman, 1989). The stigma associated with being identified a member of a low-ability group may create negative perceptions of students that, in turn, negatively affect their academic self-concept and lead to low academic aspirations (Oakes, 1981; Heathers, 1969).

Overall, empirical studies suggest no strong or consistent relationships between organizational differentiation, *per se*, and student achievement. Documented effects on achievement have been small and appear to be highly dependent on types of instructional grouping and the differences in instructional practice brought about by the grouping method. Critics of research on instructional grouping argue that a closer look at the intervening processes through which student achievement is affected by grouping is needed (e.g., Slavin, 1987; Gamoran, 1987b; Hiebert, 1987). Although research findings suggest a number of mechanisms through which positive and negative consequences of instructional grouping may accrue, there remains little known about the mechanisms through which student learning is affected. Even less is known about the effects of Title I or other categorical program organizational differentiation on student learning.

Models for Understanding the Effects of Organizational Differentiation on Student Learning

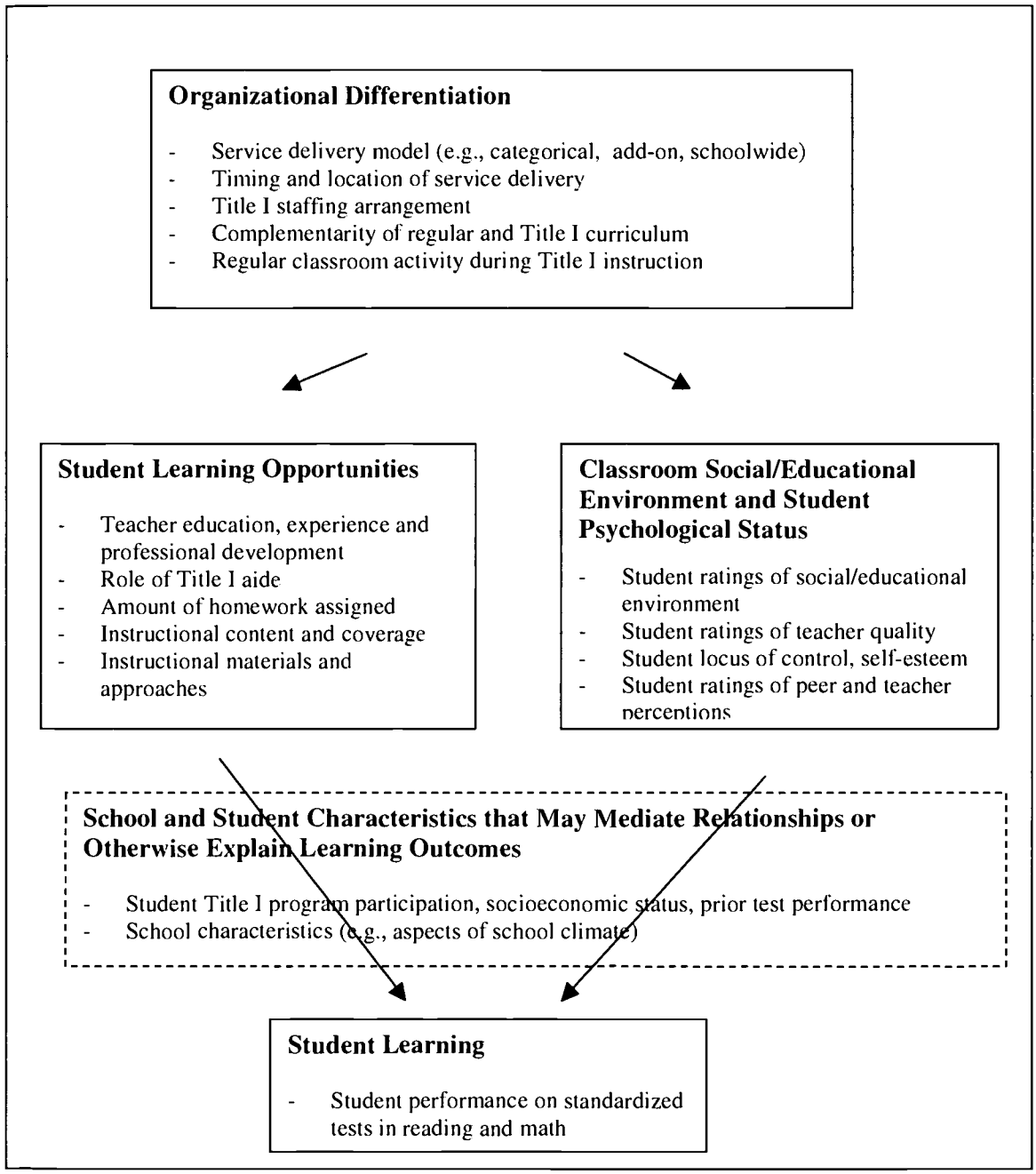
Two primary perspectives inform an understanding of the impact of organizational differentiation on student learning. The first focuses on the allocation of instructional resources and the second focuses on social, organizational, and psychological consequences that may affect student learning.

Resource Allocation Perspective. A characteristic example of the resource allocation perspective is Barr & Dreeben's (1983) model of within-school resource allocation. This model focuses on the allocation of instructional resources, including instructional materials, time, and content coverage. Under this theory, the ability of the group in which students are placed affects the ways that classrooms are arranged for instruction. Based on the average class ability level, a teacher will adjust the difficulty of instructional materials, the amount of time devoted to particular topics, and the total amount of learning materials to which students are exposed. Thus, the educational opportunities afforded to students will vary according to the average ability level of their peers and will, in turn, influence student learning. The extent to which instructional groups are differentiated with respect to the amount and nature of what is taught in them will therefore determine what a student can learn.

Socio-Psychological Perspective. A second perspective considers a range of social and psychological impacts that result from organizational differentiation. Perhaps the most comprehensive example of this perspective is presented by Sorensen (1970, 1978). Sorensen characterizes the impacts of organizational differentiation as being: a) direct (i.e., through effects on student aspirations, sense of control, interest, and self-image) and b) indirect (i.e., through effects on characteristics of student peers and teachers). The theory also incorporates elements of the resource allocation perspective by elaborating separately on how organizational differentiation affects teacher allocation and behavior (through differential allocation of competent and experienced teachers and through teacher expectations). The primary focus of the theory is on the variation that can be explained by differences in social environments and their social and psychological consequences, even in cases where curricula are presumed to be identical (1978).

The resource allocation and socio-psychological perspectives are not mutually-exclusive. Rather, each has a distinct emphasis and suggests different primary mechanisms through which organizational differentiation might affect student learning. Neither model, however, fully specifies the range of mechanisms through which organizational differentiation might affect student learning. The present analyses are informed by both of these perspectives and consider the relationship between organizational differentiation and student learning as being mediated by two primary mechanisms: 1) differences in resource allocation which affect the overall learning opportunities available to students and 2) consequences for the a) classroom social and educational environment and, b) psychological status of students. Figure 1 presents an integrated model, illustrating the joint effects of these mechanisms.

Figure 1. An Integrated Model of the Effects of Categorical Program Organizational Differentiation on Student Achievement



Analytical Hypotheses

Three sets of analyses were conducted to explore the following three central topics:

1. The nature and extent of Title I organizational differentiation;
2. The relationships between organizational differentiation and educational opportunity, classroom social/educational environment, and student psychological status; and,
3. The relationship between organizational differentiation and student achievement.

Because of the strong, historically categorical orientation of Title I service delivery, it was hypothesized that a range of differentiating practices would be evident in schools implementing Title I programs. Despite the expectation that schoolwide programs integrate curriculum and instruction for all students, pullout programs and other differentiating practices have persisted during the early years of schoolwide implementation (Wong & Meyer, 1998). Therefore, it was expected that differentiating approaches would be evident across all Title I schools. However, it was expected that, in schools with targeted-assistance (i.e., categorical) Title I programs, differentiating practices would be implemented more frequently than in schoolwide programs and would include the following: 1) increased use of pullout practices; 2) Title I service delivery during regular instruction in reading and math; 3) increased reliance on specialized teaching staff (e.g., aides) for instruction; and 4) differentiated instructional content and materials.

The integrated model presented in the prior section illustrates the other central hypotheses of these analyses: 1) that organizational differentiation is related to a) student learning opportunities; b) aspects of the classroom social and educational environment, and c) student psychological characteristics; and 2) that these three classes of factors (a, b, and c) represent mechanisms through which organizational differentiation affects student learning in reading and math.

Sample and Method

All analyses use data from *Prospects: The Congressionally-Mandated Study of Educational Growth and Opportunity*. The *Prospects* data provide achievement and other student information and a range of information about the schools and classrooms that serve them for a nationally representative sample of nearly 40,000 students who were in grades 1, 3, and 7 in 1991. The core data used for this analysis were derived from Title I and regular classroom teacher questionnaires (including the "student profile" completed by the teacher most familiar with the student), student questionnaires, data from student records (collected using the "student abstract" instrument), and scale score data for the Comprehensive Tests of Basic Skills, Fourth Edition (CTBS/4). *Prospects* represents the most comprehensive and current existing data source available for information about the operations of Title I and regular classrooms in the United States.

Although the *Prospects* data include longitudinal information for a total of four years, these analyses focused on data collected for Cohort 3, during the third year of the study (students in 5th grade during the 1992-93 school year), focusing on a cross-sectional description of

organizational differentiation, its consequences, and their relationship to student learning. Based on exploratory analyses, this sample was selected to maximize the analytic objectives.

All analyses focus on the organizational differentiation associated with Title I participation. Approximately 60 percent of the students in the 1992-93 fifth grade sample (n=12,012) were identified as attending schools offering a Title I program in fifth grade (n=7,017). Descriptive analyses suggest that that the reduced sample consists of students with characteristics that closely resemble those in the nationally-representative fifth grade sample.

Three phases of analysis were conducted. The first analyses were designed to generate national estimates of the nature and extent of organizational differentiation in schools with Title I programs under different models of service delivery. The second phase of analysis investigated the relationship between organizational differentiation and 1) student learning opportunities; 2) aspects of the social and educational classroom environment; and 3) student psychological characteristics. The third phase of analyses used hierarchical models to explore two relationships between organizational differentiation and student learning in reading and math: 1) the relationship between organizational differentiation and student learning; and 2) the mediating effects of differences in student learning opportunities, aspects of the social and educational classroom environment, and student psychological characteristics on the relationship between organizational differentiation and student learning. All analyses present subject-specific findings, related to reading/language arts and math.

The first analyses describe the learning experiences of Title I students exclusively, focusing on the extent to which Title I service delivery differentiates the educational experiences of Title I participants relative to the regular instructional program in schools and classrooms. These analyses also compare Title I service delivery models, focusing on differences in indicators of organizational differentiation in Title I schoolwide programs and targeted-assistance Title I schools. The total samples of Title I students with information about school and classroom differentiation practices include 1,658 students identified as Title I reading/language arts participants and 1,381 students identified as Title I math participants.

This first, descriptive phase of analysis presents a series of comparative item frequencies and means, using many original questionnaire response categories. In the subsequent two phases of analyses, a range of composite variables were created. Composite variables were created using several items to yield a more accurate measure than the score from a single item, as well as to create parsimony and increase the interpretability of the remaining analyses.

Subsequent analyses consider the experiences of both Title I participants and non-participants. As with the samples taken for the first phase of analysis, subject-specific samples were taken for reading/language arts and math. The objectives of the second and third phases of analysis required that students be selected based on the following criteria: 1) students were identified as being in the *Prospects* core student sample and were in fifth grade during the 1992-1993 school year; 2) student achievement data were available for both the Spring 1992 and Spring 1993 CTBS administrations; 3) data were available to measure other key student, classroom, and school characteristics relevant to the integrated model of the effects of organizational differentiation; and, 4) (after the selection criteria above), both Title I participants and their non-participating peers were nested within a regular classroom for which data were available for at least 10 students and having at least one Title I participant.

The analytical samples represent 41 and 42 percent of the total Title I reading/language arts and math samples, respectively. Two phenomena explain this sample reduction. First, just under 60 percent (n=6,870) of the 12,012 students in fifth grade during the 1992-1993 school

year have reliable data associating them with a regular teacher and a classroom for reading/language arts and/or math. Second, among students with teacher and classroom identifying data, about 16 percent (n=1,118) were in regular classrooms with fewer than 10 students. Over the course of the *Prospects* study, students in the sample were increasingly distributed among schools and classrooms creating attrition for both the overall sample and the samples within initially-sampled schools.

Comparisons of the analytical samples to the total samples of Title I reading/language arts and math participants and non-participants indicate few differences, although the analytical samples had fewer Hispanic students, fewer limited-English proficient students, and fewer students from the western Census region. Differences among the analytical samples of Title I non-participants were small and were not consistent across the reading/language arts and math samples, suggesting little reason for concern about their influence on subsequent analyses.

The analytical sample of students in regular reading/language arts classrooms consisted of 2,672 students in 161 classrooms in 85 schools. The analytical sample of students in regular math classrooms consisted of 1,991 students in 123 classrooms in 73 schools. Across both classrooms and schools, the average proportion of Title I students among sampled students was between approximately 40 to 44 percent for both reading/language arts and math classrooms.

A substantial proportion of sampled classrooms consisted of 20 percent or fewer Title I students—approximately 45 percent of classrooms in the reading/language arts sample and 35 percent of classrooms in the math sample. Because the average number of sampled students in a classroom was about sixteen, many of these classrooms had only two or three Title I students. Another approximately 20 percent of sampled reading/language arts classrooms and 15 percent of math classrooms consisted entirely of Title I participants. The majority of the remaining classrooms were comprised of sampled students, less than half of whom were Title I participants.

The Nature and Extent of Title I Organizational Differentiation

Based on the total samples of Title I reading/language arts and math participants, the first analyses describe the nature and extent of organizational differentiation in schools and classrooms serving the nation's fifth grade students during the 1992-1993 academic year. These descriptive analyses provide information to address the following questions about the organizational differentiation associated with Title I programming:

- How does Title I Differentiate Instructional Organization?
  - To what extent do Title I programs use service delivery approaches that supplement overall instructional time?
  - Do Title I services supplement or supplant the instruction that students receive in their regular classrooms?

- How does Title I Differentiate Instructional Content?
  - To what extent do curricular materials differ across regular and Title I classrooms?
  - Are students removed from their regular classrooms for Title I instruction?

- Does the organizational differentiation associated with Title I vary across service delivery approaches (i.e., across schoolwide vs. targeted-assistance Title I approaches)?

At the time these data were collected, Title I legislation required that schools implementing schoolwide programs have a student population with a minimum of 75 percent low-income students. To create a comparable sample of targeted-assistance Title I schools, only high-poverty Title I schools (defined as those having 75 percent or more low-income students) were included.

A comparison of student characteristics among those who attend these two types of Title I schools indicates some differences among the student populations. The vast majority of Title I students were minority (i.e., non-white) students; however, schoolwide program schools served a greater proportion of African-American students, while targeted-assistance Title I schools served a majority of Hispanic students. Students attending schoolwide program schools were also more heavily concentrated in the southern United States, in rural communities, and in large cities, while their counterparts in targeted-assistance Title I schools attended schools in the western United States, in suburban communities, and in smaller cities or towns.

Differentiation of Instructional Organization and Content in Title I Schools

Initial descriptive analyses suggest that Title I programs substantially differentiated both the instructional arrangements and the instructional content offered to fifth grade Title I participants in both reading/language arts and math. Indices of organizational differentiation suggest that a range of Title I service delivery approaches were used—including those that both supplement and supplant regular instruction. Data presented in this section are summarized in Table 1.

[TABLE 1 ABOUT HERE]

Considering the entire sample of Title I participants, most received instruction outside of their regular classroom with a Title I teacher (61 percent of reading/language arts participants and 50 percent of math participants). Fewer students attended classrooms where instruction was delivered by a Title I teacher inside the regular classroom (25 percent of reading/language arts participants and 29 percent of math participants). Very few students (4.6 percent of reading/language arts participants and 6.2 percent of math participants) received instruction exclusively from a Title I teacher. Supplemental Title I programs, such as add-on programs, were offered relatively infrequently (school year add-on programs were offered to about one-fifth of students and summer add-on programs were offered to about one-third of students) in both reading/language arts and math.

The majority of Title I participants attended schools where the curriculum was at least somewhat differentiated among Title I and regular classrooms. Most Title I reading/language arts participants attended schools where Title I and regular classroom curricular materials were either the same (39 percent) or a mix of same and different (46 percent). Only about 15 percent of students attended schools where reading/language arts Title I classrooms used different curricular materials. The results were similar for math participants, suggesting slightly more use of similar materials.

Although the differences are slight, several indicators show that Title I organizational differentiation was less in math than in reading. Title I participants were less likely to receive

instruction outside of their regular classroom and were less likely to attend schools where a different curriculum was used across Title I and regular classrooms.

Differentiation of Instructional Organization and Content in Schoolwide Versus Targeted Assistance Title I Schools

Although a central expectation of schoolwide programs is that they provide Title I services to all students in the school, just over half of schoolwide program schools serving the Title I reading/language arts and math samples continued to deliver Title I services that were distinguishable from the regular instructional program. Comparisons of schoolwide programs and targeted-assistance Title I schools suggest that schoolwide programs were less differentiated in terms of both instructional organization and content. Despite the prevalence of targeted-assistance practices in many schoolwide programs, these schools were more likely to offer school-year and summer add-on programs; to provide students with similar curriculum across regular and Title I classrooms; and to provide Title I instruction in the regular classroom.

Reading/language arts participants in targeted-assistance Title I schools were nearly three times as likely as those in schoolwide programs to attend classrooms where Title I teachers delivered instruction outside of the regular classroom. For math participants, the difference across schoolwide and targeted-assistance Title I schools was less pronounced (38 percent of students attending targeted-assistance Title I schools were in classrooms that employed pullout approaches, relative to only 25 percent of their counterparts in schoolwide programs). Inclass Title I service delivery approaches (involving both a regular and Title I teacher in the regular classroom) were also slightly more likely to occur in targeted-assistance Title I schools for both reading/language arts and math participants. It may, however, be that teachers in schoolwide programs were less likely to identify teachers in the regular classroom as Title I teachers, given the intent to integrate regular and Title I programming in these schools. The proportion of students who received Title I services exclusively from a Title I teacher was approximately equal across schoolwide programs and targeted-assistance Title I schools in reading/language arts. However, while about 17 percent of math participants in targeted-assistance Title I schools received instruction exclusively from a Title I teacher, no students in schoolwide programs did.

While only about six percent of Title I reading/language arts participants attending targeted-assistance Title I schools were offered add-on programs during the school year, nearly half of their counterparts in schoolwide program schools were offered school-year add-on programs. Similarly, summer add-on programs were offered about to about 19 percent of reading/language arts Title I students in targeted-assistance schools versus 47 percent in schoolwide program schools. Students in schoolwide program schools were also more likely to be offered math add-on programs. School year and summer add-on programs were offered to approximately 70 percent of Title I students in schoolwide program schools, relative targeted-assistance schools which offered school year add-on programs to only about 6 percent of students and summer add-on programs to about 21 percent of students.

Students attending schoolwide programs were more likely than those attending targeted-assistance Title I schools to be offered a Title I curriculum that was the same as that provided in the regular classroom. Title I reading/language arts participants attending schoolwide programs were nearly twice as likely to be offered the same curriculum across regular and Title I classrooms as their counterparts in targeted-assistance Title I schools. Math Title I participants were about 2.5 times more likely to experience a like curriculum. While the proportion of

students in schools offering different curricular materials across Title I and regular reading/language arts classrooms was approximately the same for both schoolwide program and targeted-assistance Title I schools, differences were apparent for Title I math participants. Approximately 13 percent of the Title I students attending targeted-assistance Title I schools were offered a math curriculum that differed from that in the regular classroom, while none of their counterparts in schoolwide program schools experienced a different curriculum.

Students attending schoolwide program schools were also less likely to receive Title I instruction during regular classroom time. Seventy-two percent of students attending targeted-assistance Title I schools received Title I reading/language arts instruction during their regular reading/language arts classroom time, compared to only 29 percent of their counterparts in schoolwide programs. Similarly, 56 percent of students attending targeted-assistance Title I schools received Title I math instruction during their regular math class, compared to only 16 percent of student attending schoolwide programs.

The next section explores several possible consequences of the differentiation associated with Title I participation. Indicators of differentiation found to vary across Title I students were used in the subsequent phases of analysis to assess their impact on student achievement and several intermediate outcomes.

The Relationships among Title I Organizational Differentiation, its Consequences, and Effects on Student Achievement

The second and third phases of analysis focused on the relationship between organizational differentiation and student learning and the mechanisms through which student learning might be affected. Specifically, the second phase of analysis investigated the relationship between Title I organizational differentiation and 1) student learning opportunities; 2) aspects of the classroom social and educational environment; and, 3) student psychological characteristics. This analysis sought to identify factors affected by organizational differentiation that were expected to influence student learning and that may explain differences in achievement among Title I students. Guided by the findings in the second phase, the third phase explored how organizational differentiation and its consequences explained variation in Title I student achievement. Using classroom-level indicators of organizational differentiation, these analyses investigated relationships to student learning and modeled variation across two levels: students at level-one, nested within classrooms at level-two.

The Relationships between Title I Organizational Differentiation and Educational Opportunity, Classroom Social/Educational Environment, and Student Psychological Status

As discussed, research suggests educational advantages of instructional grouping for high-ability students and educational disadvantages for low-ability students. However, research that considers the mechanisms through which differentiation affects learning has been less conclusive. A range of both possible positive and negative effects that may result from differentiating practices have been suggested by both theoretical and research literature. Based on the theoretical and empirical literature, it was hypothesized that the organizational differentiation associated with a student's participation in Title I programs would result in differences in:

- learning opportunities (i.e., instructional time, homework assignment, student exposure to advanced- versus basic-skills instructional emphasis, learning materials, and student-centered instructional models; and teacher education and experience);

- the educational and social environment of the classroom (i.e., the extent of classroom disruption and student ratings of teacher quality); and

- psychological outcomes for students (i.e., student ratings of self-esteem and locus of control, and teacher and peer perceptions).

Although there is not a strong empirical basis to suggest the direction of these differences, evidence suggesting negative consequences for students in lower-ability groups would imply that increased organizational differentiation would exacerbate negative consequences for lower-ability students. Differences were therefore expected to favor students who were in less differentiated instructional arrangements. In other words, it was expected that the organizational differentiation associated with Title I participation would be associated with reduced learning opportunities, greater classroom disruption, lower student ratings of teacher quality, and lower student ratings of self esteem, locus of control, and teacher and peer perceptions.

These relationships were explored using a series of regression models which considered the relationship between organizational differentiation and several possible consequences. These analyses focused on the experiences of Title I students exclusively and the extent to which greater degrees of Title I differentiation were associated with differences in learning opportunities, classroom environment, and psychological characteristics for individual students. The second and third phases of analysis retained the schoolwide/targeted-assistance distinction, and added indices of Title I organizational differentiation that are independent of this distinction. Using these indices of organizational differentiation, the analyses presented in this section consider a range of possible social, environmental, and psychological consequences of organizational differentiation.

Differentiation was measured using three primary indicators: 1) whether or not the student attended a school implementing a Title I schoolwide program; 2) whether or not the student was pulled out of his or her regular reading/language arts or math classroom for Title I instruction; and 3) a composite indicator of the extent to which instructional content was differentiated for Title I students. A fourth indicator—the proportion of Title I students in the student's regular classroom—was added to assess the possible additional effect of concentrating Title I students within particular instructional groups. Separate ordinary least squares regression models were run for each variable and for both the reading/language and math analytic samples of Title I participants.

Title I Organizational Differentiation and Student Learning Opportunities

Tables 2 through 5 present results from the series of regression models described above. Table 6 presents a summary the information presented in Tables 2 through 5, noting significant relationships and their direction for both the reading/language arts and math samples. Several indicators of Title I organizational differentiation—including schoolwide program attendance,

pullout practices, and differentiation of instructional content—were related to differences in student learning opportunities. Students in schoolwide programs were assigned more homework in math (nearly six additional hours per week) and were provided more overall instructional time in reading/language arts (about one additional hour per week).

[TABLES 2 and 3 ABOUT HERE]

Schoolwide program attendance, however, had a mixed effect on the extent to which students were offered advanced-skill, student-centered instruction. While students in schoolwide programs used more advanced-skill, student-centered instructional materials in math (0.65 of a standard deviation), they were exposed to slightly fewer advanced activities and student-centered instructional models in both reading/language arts and math. These differences ranged from -0.22 to -0.44 of a standard deviation. This contradictory result may reflect limitations of these indicators. For example, indicators of advanced instructional materials are the same for both reading/language arts and math while indicators of student-centered instructional emphases were subject-specific and, therefore, likely to be more valid.

Title I students in schoolwide programs were more likely to receive reading/language arts instruction from more educated teachers and less likely to receive reading/language arts instruction from an aide (-0.51 of a standard deviation). However, Title I students in schoolwide programs were more likely to receive math instruction from an aide (0.26 of a standard deviation). Students in schoolwide program schools received reading/language arts instruction from slightly more educated teachers (0.36 of a standard deviation). Schoolwide program status had no significant relationship with math teacher education.

Title I pullout practices were also associated with differences in learning opportunity. Students who were pulled out of their regular classroom for Title I instruction were assigned less homework in reading/language arts (about five fewer hours per week) and received less overall instructional time in both subjects (an average of 78 fewer minutes per week in reading/language arts and over two fewer hours in math).

Pulled-out students were also less likely to be exposed to advanced instructional materials in both subjects (0.56 of a standard deviation less in reading/language arts and 0.24 of a standard deviation less in math). Regarding instructional activities, however, students pulled out of their regular classroom were more likely to be exposed to advanced instructional activities in both subjects (0.25 of a standard deviation more in reading/language arts and 0.55 more in math).

Students who were pulled out of their regular reading/language arts and math classrooms for Title I instruction were less likely to receive instruction from an aide (-0.49 and –0.39 of a standard deviation, respectively); while students pulled out of their math classrooms received instruction from slightly more educated teachers (0.33 and 0.36 of a standard deviation, respectively).

The extent to which instructional content was differentiated for Title I students was also related to indices of learning opportunity. Students who received more differentiated instruction tended to have less overall instructional time in both reading/language arts and math. A one standard deviation increase in content differentiation was associated with 69 fewer minutes of instruction in reading/language arts and 86 fewer minutes in math. Title I reading/language arts students also were assigned less homework—a one standard deviation increase in content differentiation was associated with about one half-hour less of homework assignment in reading/language arts. However, interestingly, Title I math students who received more

differentiated instruction tended to be assigned more homework (about two additional hours per week).

Content differentiation was also related to the characteristics of teachers from whom Title I students received instruction. Students who experienced more differentiated instructional content were more likely to receive instruction from an aide in both reading/language arts (0.13 of a standard deviation associated with a one standard deviation increase) and math (0.41 of a standard deviation associated with a one standard deviation increase). Students whose instructional content was differentiated were also more likely to be taught by slightly less experienced teachers. A one standard deviation increase in content differentiation was associated with about one year less of experience in both reading/language arts and math. A one standard deviation increase in the extent of content differentiation in reading/language arts was also associated with a slight (0.09 of a standard deviation) increase in teacher education.

Of the indicators of Title I organizational differentiation, the proportion of Title I students in a classroom was least related to indices of learning opportunity. Students in classrooms with proportionately more Title I students tended to be assigned less homework in reading/language arts and math. On average, a student in a classroom with ten percent more Title I students would be expected to be assigned 1.8 fewer hours per week of homework in reading/language arts and 1.7 fewer hours in math. The proportion of Title I students was associated with about 0.6 years (7.2 months) of additional teacher experience for each additional ten percent of Title I students in both subjects.

Title I Organizational Differentiation and Student Psychological Status and Ratings of Their Classroom Environment

There were fewer significant relationships between organizational differentiation and indices of student psychological status and ratings of their classroom environment. Title I math students in schoolwide programs rated teachers more favorably and were less likely to rate as the classroom as being disruptive. Additionally, for both reading/language arts and math, students in schoolwide programs reported slightly higher ratings of how their others perceive them. Interestingly, for reading/language arts students, instructional content differentiation was positively associated with increased student ratings of teacher and peer perceptions.

[TABLES 4 and 5 ABOUT HERE]

With respect to overall instructional time and homework assignment, the findings were as hypothesized. Students in schoolwide programs—which are expected to reduce differentiation—tended to have more overall instructional time and be assigned more homework. Students who were pulled-out of their regular classrooms, received differentiated instructional content, and were in classrooms with greater proportions of Title I students tended to have less overall instructional time and be assigned less homework. Across many of these regression models, it is interesting to note that, even after controlling for other indicators of organizational differentiation, whether or not a student attended a schoolwide program had an significant effect on several outcomes. This suggests that there are other aspects of schoolwide programs independent of organizational differentiation that lead to differences in learning opportunities.

[TABLE 6 ABOUT HERE]

Findings related to the use of advanced-skill, student-centered instructional materials, activities, and instructional models were less consistent. Students in schoolwide programs used more advanced-skill, student-centered instructional materials while students pulled out of their regular classrooms tended to use fewer. However, students in schoolwide programs were less likely to be in classrooms characterized by advanced-skill, student-centered instructional models and activities, while students in pullout settings were more likely to engage in more advanced instructional activities. These unexpected findings may be explained, in part, by measurement limitations. The indicators of advanced instructional emphasis and student-centered instructional models indicate only the use or non-use of a particular emphasis or approach. The indicator of advanced instructional material use, however, is an indicator of the *frequency* with which materials are used. This distinction may have resulted in a more valid indicator of instructional material use.

The relationship between organizational differentiation and the use of instructional aides was also not consistent, indicating that aides in schoolwide programs were more involved in math instruction and less involved in reading/language arts instruction. Aides tended to be less involved in pullout instructional settings and more involved when students received more differentiated instructional content. Schoolwide programs and pullout settings were also both associated with better educated teachers. This may reflect an increasing investment of teaching resources toward improving student reading ability by school administrators in high poverty schools. However, students with more differentiated instructional content tended to have less experienced teachers. The fact that students rated their classrooms as being less disruptive and having higher quality teachers in schoolwide programs, may also reflect the improved ability of school administrators to use Title I funding to hire more effective teaching staff.

Students in schoolwide programs tended to have higher ratings of teacher and peer perceptions. There was no relationship, however, between student ratings of self-esteem and teacher and peer perceptions and pullout practices, about which there has been substantial concern regarding possible stigmatization effects on students. As suggested by Gamoran (1986), it may be that these non-instructional effects of student grouping on learning become more apparent in later grades.

The Relationship between Organizational Differentiation and Student Achievement

The third phase of analysis explored how organizational differentiation and its consequences explain variation in Title I student achievement. Using classroom-level indicators of organizational differentiation, these analyses investigated:

- the relationship between organizational differentiation and its consequences (i.e., differences in student learning opportunities, aspects of the social and educational classroom environment, and student psychological characteristics) and overall classroom mean achievement; and,

- the mediating effect of differentiation and its consequences on the within-classroom achievement gap between Title I students and their more advantaged non-participating peers.

Building on the Phase II analysis, this analysis considers relationships to ultimate student learning, and models variation across two levels—students at level-one, nested within classrooms at level-two. Exploratory analyses were used to identify variables for inclusion in the Phase III models, based on their utility in explaining differences in student achievement. Because the hierarchical analyses required complete data at levels one and two, the sample sizes are slightly reduced. These analyses use a reading/language arts student sample of 1,632 students in 146 classrooms and a math student sample of 1,121 students in 104 classrooms. Across the two samples, the average number of sampled students per classroom was about eleven.

Unconditional Models

To determine the total amount of variability in reading and math achievement outcomes, a one-way random-effects analysis of variance (ANOVA) model was developed. This initial analysis indicated the amount of variability in subject-specific (reading and math) achievement within and across classrooms. The average classroom means for reading and math achievement were estimated to be –0.090 and –0.044, respectively. The level-one (i.e., student-level) variance for reading achievement was 0.689, and the variance among the *J* classroom means was 0.328. Therefore, for reading achievement, the estimated proportion of variance between classrooms was 0.322 [0.328 / (0.328 + 0.689) = 0.322]. For math achievement, the student-level variance was 0.762 and the variance among the *J* classroom math achievement means was 0.251. The estimated proportion of variance between classrooms for math achievement was therefore 0.248 [0.251 / (0.251 + 0.762) = 0.248].

Thus, about a third of the variation in reading achievement and about a quarter of the variation in math achievement was between classrooms. Previous hierarchical analyses using the *Prospects* data showed a similar difference between reading and math, i.e., more classroom-level variation could be explained in reading achievement than math achievement (Borman, 2001). Interestingly, these prior analyses focused on the experiences of first grade students and indicated that 0.193 and 0.120 of the variance in reading and math achievement (respectively) could be explained at the classroom level. This relatively lower proportion of classroom-level variation in achievement suggests an increasing effect of classroom differentiation as students progress through grades.

Student-level Models

After fitting unconditional models to assess the extent to which variation in achievement could be explained at the individual and classroom levels, student-level models were developed to account for the level-one variability, r_{ij}. At level one, reading and math achievement for student *i* in classroom *j* was regressed on subject-specific Title I participation status (TITLEI), spring 1992 achievement (PRETEST), student self-esteem as reflected by students' ratings of teacher and peer perceptions (XESTEEM), and socioeconomic status (SES).

$$Y_{ij} = \beta_{0j} + \beta_1 \text{TITLEI}_{ij} + \beta_2 \text{PRETEST}_{ij} + \beta_3 \text{XESTEEM}_{ij} + \beta_4 \text{SES}_{ij} + r_{ij}.$$

Results from univariate chi-square tests were used to determine whether there was significant variation in the reading and math achievement slopes associated with each level-one predictor variable. Non-significant variation among a given level-one slope would indicate that the relationship between the level-one predictor variable and student achievement was the same

across classrooms. These analyses indicated that the relationships between reading and math achievement and a) Title I participation status and b) pretest achievement varied significantly across classrooms. The relationships between reading and math achievement and a) student ratings of teacher and peer perceptions and b) socioeconomic status were found to vary non-significantly across classrooms.

These analyses therefore suggested that these two latter variables (student ratings of teacher and peer perceptions and socioeconomic status) be treated as fixed covariates and grand-mean centered. The differentiating effects associated with the remaining two level-one predicator variables (Title I participation status and pretest achievement) were group-mean centered and treated as random at level two, allowing the variation among classrooms to be explained at level two by classroom-level variables.

For the reading achievement model, the mean classroom achievement estimate of –0.102 was approximately the same as the unconditional model estimate of –0.090. The Title I gap was –0.134, indicating that, after taking into account other student-level characteristics, Title I student achievement was about 0.134 of one standard deviation behind that of Title I non-participants. The remaining predictors were positively related to student achievement. The pretest differentiating effect was largest, indicating that a one-standard deviation advantage at the end of the prior year was associated with an advantage of nearly three-fourths (0.722) of a standard deviation at the end of the 1992-93 school year. The external esteem differentiating effect indicated that a one standard deviation positive difference in student ratings of teacher and peer perceptions was associated with a small (0.032 standard deviation) increase in achievement. The SES differentiating effect was also small, indicating that a one standard deviation difference in socioeconomic status was associated with a 0.062 standard deviation increase in achievement. The variance, r_{ij}, represents the residual level-one variance that remained unexplained after taking into account students' Title I status, pretest performance, ratings of teacher and peer perceptions, and socioeconomic status. Because the total level-one variance was reduced from 0.689 in the unconditional model to 0.273 in the student-level model, these predictors accounted for 60.4 percent of the total level-one variability [(0.689 – 0.273) / 0.689 = 0.604].

The student-level model for math achievement estimated a mean intercept of –0.034. The Title I achievement gap was –0.163 indicating that, after controlling for other predictor variables, Title I non-participants outperformed Title I math participants by about one-sixth of a standard deviation. As with the reading achievement model, pretest status, student ratings of teacher and peer perceptions, and socioeconomic status were all positively related to math achievement. The strength of these associations was of a similar magnitude. In the math achievement model, the total level-one variance was reduced from 0.762 in the unconditional model to 0.308 in the student level model. Thus, the student-level model accounted for 59.6 percent of the total level-one variability [(0.762 – 0.308) / 0.762 = 0.596].

At level two of both the reading and math achievement models, the classroom mean achievement intercept, Title I gap coefficient, and pretest differentiation coefficient varied significantly across classrooms[1]. As described earlier, prior analyses indicated non-significant level-two variation for esteem differentiation and socioeconomic differentiation across classrooms. These coefficients were specified as fixed effects at level two for both the reading and math models.

[1] The chi-square statistics reported in all tables in this section are based only on classrooms that had sufficient data for computation. Reported fixed effects and variance components, however, are based on data for all of the classrooms in the sample.

Classroom-level Models

Hierarchical analyses were used to model the relationship between the organizational differentiation and its consequences and overall classroom mean achievement and to assess the potential mediating effects of organizational differentiation and its consequences on the Title I achievement gap. Based on results from the Phase II analysis, those variables found to be significantly related to indicators of organizational differentiation were retained for the classroom-level hierarchical models.

The following classroom-level model was used to assess these relationships:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}\text{ORGDIFF}_j \ldots \gamma_{011}\text{ORGDIFF}_j + u_{0j},$$
$$\beta_{1j} = \gamma_{10} + \gamma_{11}\text{ORGDIFF}_j \ldots \gamma_{111}\text{ORGDIFF}_j + u_{1j},$$
$$\beta_{2j} = \gamma_{20},$$
$$\beta_{3j} = \gamma_{30},$$
$$\beta_{4j} = \gamma_{40}.$$

The esteem differentiating effect, β_{3j}, and SES differentiating effect, β_{4j}, were treated as fixed at level two. The pretest differentiation effect, β_{2j}, was also fixed at level two, because this effect could not be causally influenced by aspects of organizational differentiation during the 1992-93 school year. The classroom mean intercept, β_{0j}, and Title I gap, β_{1j}, were allowed to vary randomly across classrooms. Variables representing classroom-level aspects of organizational differentiation and its consequences were used to predict classroom achievement, β_{0j}, and their mediating effects on the Title I achievement gap, β_{1j}. To increase interpretability of the results, unstandardized variables were used where possible (e.g., minutes of instruction per week). All other variables were standardized with a mean of zero and standard deviation of one. The intercept, β_{0j}, is therefore interpretable as the mean outcome in classroom *j*, controlling for the other predictor variables in the level-two model.

The results of the models for reading and math achievement are presented in Tables 7 and 8. The reading achievement model indicates that aide involvement in direct instruction is significantly and negatively related to classroom mean achievement. This suggests that, after controlling for the other variables, increased involvement of classroom aides was related to lower overall classroom achievement. A one standard deviation increase in aide involvement was associated with 0.165 standard deviation reduction in reading achievement. One other variable indicated a marginally significant and positive relationship to classroom mean achievement: the use of advanced classroom materials ($t = 1.73$, $p = 0.080$). None of the level-two predictors were significantly related to the Title I gap.

As was suggested by the student-level model, pretest differentiation, external esteem differentiation, and socioeconomic status were significantly and positively related to classroom mean achievement, with pretest differentiation having the largest effect.

Comparing the conditional level-two variances with the unconditional level-two variance indicates a reduction of unexplained variability across classrooms of about 8 percent [(0.358 – 0.328) / 0.358 = 0.084]. Although none of the level-two predictors were significantly related to the Title I gap, the model nonetheless reduced the amount of unexplained variability for this indicator across classrooms approximately 60 percent [(.0.114 – 0.046) / 0.114 = 0.596].

The model predicting math achievement is presented in Table 8. The model indicates that use of student-centered instructional models in mathematics is significantly and negatively related to classroom mean achievement. The results suggest that a one standard deviation increase in the use of student-centered instructional models is associated with a –0.128 standard deviation difference in classroom mean achievement. As was the case in the reading achievement model, none of the level-two predictors were significantly related to the Title I gap. Also as in the reading achievement model, the math results indicate that pretest differentiation, external esteem differentiation, and socioeconomic status were significantly and positively related to classroom mean achievement, with pretest differentiation having the largest effect.

Comparison of the conditional level-two variances with the unconditional level-two variance indicates a reduction of unexplained variability across classrooms of about 11 percent [(0.285 – 0.254) / 0.285 = 0.109]. Although none of the level-two predictors were significantly related to the Title I gap, the model nonetheless reduced the amount of unexplained variability for this indicator across classrooms approximately 75 percent [(0.158 – 0.039) / 0.158 = 0.753].

Summary

The student-level models explained a substantial proportion of the variation in student achievement in both reading and math—about 60 percent—and indicated that Title I participants lagged significantly behind non-participants, after controlling for other student characteristics. In both the reading and math models, the pretest differentiating effect had the largest impact on student achievement, indicating that a one standard deviation increase on the prior year test was associated with a nearly three-quarters of a standard deviation increase at the end of the 1992-93 school year. Student ratings of teacher and peer perceptions and socioeconomic status had a relatively much smaller effect on achievement in both subjects.

The hierarchical analyses indicated that a substantial proportion of variation in achievement was among classrooms (approximately one third in reading and one quarter in math). Results from univariate chi-square tests revealed that the relationships between reading and math achievement and a) Title I participation status and b) pretest achievement varied significantly across classrooms. The relationships between reading and math achievement and a) student ratings of teacher and peer perceptions and b) socioeconomic status were found to vary non-significantly across classrooms.

Despite a range of classroom characteristics considered, the classroom-level models explained relatively less of the level-two variation, accounting for about 8 and 11 percent in reading and math achievement, respectively. The reading achievement model suggested that aide involvement in direct instruction was associated with lower overall classroom achievement. A one standard deviation increase in aide involvement was associated with 0.165 standard deviation reduction in reading achievement. This is notable, in that it suggests an independent effect on achievement associated with direct instruction by aides, even after controlling for a range of indicators of learning opportunity. Although only marginally significant, there was also

a slight positive relationship between the use of advanced materials and average classroom achievement.

The math achievement model indicated that the use of student-centered instructional models in mathematics was significantly and negatively related to classroom mean achievement. A one standard deviation increase in the use of student-centered instructional models was associated with a –0.128 standard deviation difference in classroom mean achievement. As discussed earlier, because this indicator is a composite of teacher reports of use/non-use of particular methods, rather than frequency of use, its validity may be compromised. Further, several of the student-centered models are more typically applied to reading/language arts than math, which may also compromise the validity of this measure for math instruction. Although the Phase II analysis suggested several differences in learning opportunity and other consequences related to organizational differentiation, neither the reading nor the math achievement models identified level-two predictors that were significantly related to the Title I gap.

These analyses showed few relationships between indicators of differentiation, its consequences, and student achievement. Interestingly, once the Title I-achievement and pretest-achievement slopes were accounted for, the socioeconomic status-achievement slope did not vary significantly across classrooms. This suggests that classroom grouping was based primarily on student ability (as measured by prior performance), and had no consistent relationship with socioeconomic status.

Discussion And Policy Implications

These analyses revealed a range of differentiating practices in Title I classrooms as well as their consequences, most centrally, for student learning opportunities. There remains substantial uncertainty about organizational differentiation and its effects, however. Further, in addition to the lack of compelling evidence about the effectiveness of Title I programs, there is little consensus about which Title I program models or program components hold the most promise for improving achievement among disadvantaged students. Thus, further analyses that shed light on the effects of differentiating practices—which continue to be a central element of Title I programs—remain critical.

The typical fifth grade Title I classroom substantially differentiated both the instructional arrangement and the instructional content offered to Title I participants in both reading/language arts and math. Most Title I participants received instruction outside of their regular classroom with a Title I teacher and attended schools where curricula was at least somewhat differentiated among Title I and regular classrooms. While differences were small, several findings indicate that Title I organizational differentiation tended to be less in math than in reading.

The most prevalent form of Title I service delivery—Title I pullout programming—was generally associated with reduced learning opportunities. Students who were pulled out of their regular classroom for Title I instruction were assigned less homework in reading/language arts and received less overall instructional time in both reading/language arts and math. Pulled-out students were also less likely to be exposed to advanced instructional materials in both subjects. These students, however, were more likely to be exposed to advanced instructional activities in both subjects. Indicators of instructional content differentiation were also related to learning opportunity. Students who received differentiated instruction were more likely to be taught by

an aide and were taught by slightly less experienced teachers in both reading/language arts and math. However, students in more differentiated reading/language arts settings also received instruction from slightly more educated teachers.

There were inconsistent and fewer relationships between organizational differentiation and student psychological status and classroom environment ratings. Interestingly, for reading/language arts students, instructional content differentiation was positively associated with increased student ratings of external esteem (ratings of teacher and peer perceptions). Perhaps more surprisingly, there was no relationship between student ratings of self-esteem and pullout practices, about which there has been substantial concern. As discussed earlier, it may be that these non-instructional effects of differentiation become more apparent in later grades.

Comparisons of schoolwide programs and targeted-assistance Title I schools suggest that schoolwide programs were less differentiated in terms of both instructional organization and content. Despite the prevalence of categorical practices in many schoolwide programs, these schools were more likely to offer add-on programs; to provide students with similar curriculum across regular and Title I classrooms; and to provide Title I instruction in the regular classroom. Students in schoolwide programs were assigned more homework and were provided more overall instructional time in both reading/language arts and math. Schoolwide program attendance, however, had a mixed effect on the extent to which students were offered advanced-skill, student-centered instruction. Title I math students in schoolwide programs rated teachers more favorably and were less likely to rate the classroom as being a disruptive environment. Additionally, for both reading/language arts and math, students in schoolwide programs reported slightly higher ratings of external esteem (how their teachers and peers perceive them). Notably, these differences were apparent even after controlling for other indicators of organizational differentiation.

The Title I achievement gap was substantial for both reading/language arts and math—Title I participants tended to perform, on average, about a year below grade level, while their non-participating peers performed close to grade level. Neither achievement model, however, identified aspects of organizational differentiation or its consequences that accounted for this achievement gap. Nonetheless, the reading achievement model suggested that aide involvement in direct instruction was associated with lower overall classroom achievement and the math achievement model indicated that the use of student-centered instructional models in mathematics was significantly and negatively related to classroom mean achievement. This underlines the importance of ensuring that externally-developed instructional models are carefully selected and implemented effectively.

While these analyses revealed no substantial impact of organizational differentiation and its consequences on student achievement, they nonetheless highlighted the tendency of Title I organizational differentiation to limit learning opportunities and—to a lesser extent—foster differences in classroom social/environmental factors and student psychological characteristics. These differences may intensify as students progress through grades, suggesting the importance of longitudinal research on differentiating practices to test the reliability of these findings and their applicability to other grade levels and other instructional settings. Mixed method studies might also further inform questions about organizational differentiation. For example, there is a reasonable basis—and some empirical evidence—for the contention that differentiation can result in both positive and negative outcomes for students. Because positive and negative effects may occur simultaneously, they may mask important relationships. Case study or interview data

with students might better inform an understanding of the processes through which differentiating practices affect students.

The relative lack of evidence for the effectiveness of Title I programs and for particular Title I instructional models or practices underlines the importance of continued research in this area. Of particular relevance, therefore, were the findings related to Title I schoolwide programs. Students in schoolwide programs were offered increased learning opportunities, rated their classroom environment more favorably, and reported higher ratings of self-esteem, reflected by their perceptions of what others think of them. Given that reducing organizational differentiation is an implicit goal of the schoolwide program model, there is great potential to continue to explore questions about organizational differentiation while evaluating schoolwide program implementation and outcomes.

Related analyses of the *Prospects* data found few school characteristics that were associated with instructional content differentiation (Meyer, 2000). There are nonetheless likely aspects of organizational differentiation that contradict aspects of school organization known to be characteristic of effective schools. For example, differentiated curriculum and instruction may inhibit the development of shared goals among staff and a collective understanding of the means to best achieve them. Therefore, understanding the consequences of organizational differentiation such as their impact on teacher interaction and coordination, and consequent school climate is important.

The expansion of schoolwide programs represents one of many recent legislative initiatives that focus on whole school reform and high achievement goals for all students. In recent years, the federal government recently has encouraged whole school reforms under the Comprehensive School Reform Demonstration Program (CSRD) (U.S. Dept. of Education, 1998). Focusing on several externally-developed, research-based models, the CSRD targets schools identified as needing improvement (many of which are Title I schools). A central component of the CSRD is that schools implement reform models designed to help all children to meet high educational standards. Further, federal legislative expectations for Title I programs were recently expanded to include challenging state content and performance standards (U.S. Department of Education, 1996). States are expected to establish content and performance standards for Title I students, which reflect the same knowledge, skill, and performance levels that are expected of all children. Schoolwide programs therefore offer an organizational mechanism through which these new legislative expectations can be met and under which many whole school reform models can be implemented.

Despite the emphasis on whole school reforms that maintain high achievement goals for all students, there are simultaneous reform efforts that increase organizational differentiation. An increasingly prevalent form of organizational differentiation in recent years, for example, has been brought about by an increased emphasis on student and school accountability policies. Recent large-scale policy initiatives, such as policies that retain low-achieving students in grade, are one salient example of an educational practice that substantially differentiates the experiences of students. While revised testing and promotion policies are designed to ultimately hold students to the same high standards, in practice they serve a differentiating function, targeting students for separate, specialized instruction. Thus, understanding organizational differentiation and its effects will continue to be an important component in the evaluation of many current reforms. As these reforms are more fully implemented (e.g., as schoolwide programs offer less differentiated Title I instruction), there will be continued opportunities to explore questions about the effects of organizational differentiation.

Table 1. Differentiation of Instructional Organization and Content in Title I Schools (Schoolwide and Targeted Assistance Title I Schools)

	Title I Reading/Language Arts			Title I Math Participants		
	All Title I Students	In Title I Schoolwide Programs	In Targeted-Assistance Title I Schools	All Title I Students	In Title I Schoolwide Programs	In Targeted-Assistance Title I Schools
	%	%	%	%	%	%
Students who Receive Instruction Under the Following Arrangements (Title I teacher report)						
From Title I teacher outside of the regular classroom	61.3	21.2	60.8	50.6	24.7	37.9
From regular and Title I teacher in the regular classroom	24.8	26.5	30.2	29.2	8.6	16.2
From Title I teacher exclusively	4.6	13.8	13.5	6.2	0	16.9
Students Attending Schools with Fifth Grade Title I Add-on Program (principal report)						
During the School Year	20.7	48.9	6.1	20.9	71.7	5.4
During the Summer	31.5	47.3	19.2	33.5	70.1	20.6
Students Attending Schools with Similar Curricular Materials Across Title I and Regular Classrooms (principal report)						
Same Materials	38.8	50.2	27.8	48	64.5	26.5
Some Same/Different Materials	45.8	36.9	61.5	47.9	35.5	60.4
Different Materials	15.4	12.9	10.7	4.1	0	13.1
Students who Receive Title I Instruction During Regular Class Time (Title I teacher report)	50.5	29.4	72.2	36.3	16.1	59.8
Total Ns	**1,658**	**957**	**701**	**1,381**	**716**	**665**

Table 2. Effect of Organizational Differentiation on Learning Opportunities: Instructional Characteristics

	Title I Reading/Language Arts			Title I Math Participants		
	Coefficient	Std Error	Rsq (adj)	Coefficient	Std Error	Rsq (adj)
Homework Assigned						
Intercept	22.01 ***	0.66	0.31	19.63 ***	0.68	0.26
Schoolwide Program	1.17	0.64	(0.31)	5.66 ***	0.78	(0.26)
Pullout	-5.03 ***	0.62		-0.40	0.69	
Content Differerentiation	-0.50 *	0.25		2.08 ***	0.35	
Proportion Title I Students	-0.18 ***	0.01		-0.17 ***	0.02	
	N=664			N=531		
Instructional Time						
Intercept	466.88 ***	24.94	0.12	430.90 ***	24.80	0.16
Schoolwide Program	63.07 **	24.65	(0.12)	57.79	29.53	(0.15)
Pullout	-77.82 **	23.60		-134.24 ***	25.41	
Content Differerentiation	-69.07 ***	9.96		-86.09 ***	13.05	
Proportion Title I Students	-0.37	0.54		-0.23	0.56	
	N=644			N=550		
Advanced Materials						
Intercept	0.24 **	0.07	0.12	0.15	0.08	0.18
Schoolwide Program	0.03	0.07	(0.11)	0.65 ***	0.09	(0.17)
Pullout	-0.56 ***	0.07		-0.24 ***	0.08	
Content Differerentiation	-0.11 ***	0.03		0.08	0.04	
Proportion Title I Students	0.00	0.00		-0.01 ***	0.00	
	N=706			N=600		
Advanced Emphasis						
Intercept	-0.01	0.08	0.06	-0.26 ***	0.07	0.11
Schoolwide Program	-0.26 **	0.08	(0.05)	-0.35 ***	0.09	(0.11)
Pullout	0.25 **	0.08		0.55 ***	0.07	
Content Differerentiation	0.13 ***	0.03		-0.14 ***	0.04	
Proportion Title I Students	0.00 *	0.00		0.00	0.00	
	N=673			N=575		
Student-Centered Models						
Intercept	0.33 ***	0.08	0.05	0.27 ***	0.07	0.03
Schoolwide Program	-0.44 ***	0.08	(0.05)	-0.22 ***	0.08	(0.02)
Pullout	-0.13	0.07		-0.01	0.07	
Content Differerentiation	-0.06 *	0.03		0.04	0.04	
Proportion Title I Students	0.00	0.00		0.00	0.00	
	N=708			N=603		

Note: For all tables, *p<.05. **p<.01. ***p<.001. N=number of respondents.

Table 3. Effect of Organizational Differentiation on Learning Opportunities: Instructor Characteristics

	Title I Reading/Language Arts			Title I Math Participants		
	Coefficient	Std Error	Rsq (adj)	Coefficient	Std Error	Rsq (adj)
Aide Instructional Role						
Intercept	0.73 ***	0.09	0.13	0.46 ***	0.10	0.14
Schoolwide Program	-0.51 ***	0.09	(0.13)	0.26 *	0.11	(0.13)
Pullout	-0.49 ***	0.09		-0.39 ***	0.10	
Content Differerentiation	0.13 ***	0.04		0.41 ***	0.05	
Proportion Title I Students	-0.01 ***	0.00		0.00	0.00	
	N=656			N=544		
Teacher Experience						
Intercept	14.48 ***	0.57	0.05	13.26 ***	0.62	0.06
Schoolwide Program	-0.20	0.56	(0.05)	1.28	0.72	(0.06)
Pullout	-0.94	0.53		-0.58	0.62	
Content Differerentiation	-0.99 ***	0.22		-0.97 **	0.32	
Proportion Title I Students	0.06 ***	0.01		0.06 ***	0.01	
	N=708			N=603		
Teacher Education						
Intercept	-0.39 ***	0.08	0.06	-0.36 ***	0.07	0.10
Schoolwide Program	0.36 ***	0.08	(0.05)	0.04	0.08	(0.09)
Pullout	0.33 ***	0.07		0.36 ***	0.07	
Content Differerentiation	0.09 **	0.03		-0.03	0.03	
Proportion Title I Students	0.00 *	0.00		0.01 ***	0.00	
	N=708			N=606		
Teacher Professional Development						
Intercept	2.50 ***	0.07	0.02	2.57 ***	0.07	0.09
Schoolwide Program	0.04	0.07	(0.01)	-0.08	0.09	(0.08)
Pullout	-0.01	0.07		-0.09	0.07	
Content Differerentiation	-0.09 **	0.03		-0.20 ***	0.04	
Proportion Title I Students	0.00	0.00		0.01 ***	0.00	
	N=708			N=603		

Note: For all tables, *p<.05. **p<.01. ***p<.001. N=number of respondents.

Table 4. Effect of Organizational Differentiation on Classroom Social/Educational Environment (Regression Coefficients and Standard Errors)

	Title I Reading/Language Arts			Title I Math Participants		
	Coefficient	Std Error	Rsq (adj)	Coefficient	Std Error	Rsq (adj)
Locus of Control						
Intercept	-0.27 **	0.09	0.01	-0.30 ***	0.09	0.01
Schoolwide Program	0.11	0.09	(0.00)	0.08	0.11	(0.00)
Pullout	-0.13	0.09		-0.08	0.09	
Content Differerentiation	0.02	0.03		-0.02	0.05	
Proportion Title I Students	0.00	0.00		0.00	0.00	
	N=669			N=570		
Self-Esteem						
Intercept	-0.20 *	0.08	0.00	-0.22 *	0.08	0.01
Schoolwide Program	0.08	0.08	(0.00)	0.12	0.10	(0.00)
Pullout	-0.04	0.08		-0.07	0.09	
Content Differerentiation	0.00	0.03		0.00	0.04	
Proportion Title I Students	0.00	0.00		0.00	0.00	
	N=671			N=571		
Peer Perceptions						
Intercept	-0.17 *	0.08	0.01	-0.16	0.08	0.02
Schoolwide Program	0.19 *	0.08	(0.00)	0.22 *	0.10	(0.01)
Pullout	-0.05	0.08		-0.14	0.08	
Content Differerentiation	-0.01	0.03		-0.01	0.04	
Proportion Title I Students	0.00	0.00		0.00	0.00	
	N=654			N=559		

Note: For all tables, *p<.05. **p<.01. ***p<.001. N=number of respondents.

Table 5. Effect of Organizational Differentiation on Psychological Status (Regression Coefficients and Standard Errors)

	Title I Reading/Language Arts			Title I Math Participants		
	Coefficient	Std Error	Rsq (adj)	Coefficient	Std Error	Rsq (adj)
Teacher Quality						
Intercept	-0.17 *	0.08	0.02	-0.09	0.08	0.03
Schoolwide Program	0.15	0.08	(0.01)	0.30 **	0.09	(0.02)
Pullout	-0.08	0.07		-0.14	0.08	
Content Differerentiation	0.00	0.03		0.03	0.04	
Proportion Title I Students	0.01 **	0.00		0.00	0.00	
	N=644			N=554		
Classroom Disruption						
Intercept	0.30 ***	0.08	0.01	0.24 **	0.08	0.01
Schoolwide Program	-0.14	0.08	(0.00)	-0.21 *	0.10	(0.00)
Pullout	-0.13	0.08		-0.02	0.08	
Content Differerentiation	-0.02	0.03		-0.03	0.04	
Proportion Title I Students	0.00	0.00		0.00	0.00	
	N=648			N=552		

Note: For all tables, *p<.05. **p<.01. ***p<.001. N=number of respondents.

Table 6. Summary of Findings: Phase II Analysis

	Schoolwide Program		Pullout		Content Differentiation		Proportion of Title I Students	
	Reading/ language arts	Math	Reading/ language arts	Math	Reading/ language arts	Math	Reading/ language arts	Math
Learning Opportunities								
Homework Assignment		+	-		-	+	-	-
Instructional Time	+		-	-	-	-		
Advanced Materials		+	-	-	-			(-)
Advanced Emphasis	-	-	+	+	+	-		
Student-Centered Models	-	-			(-)			
Aide Role in Direct Instruction	-	+	-	-	+	+		
Teacher Experience					-	-	(+)	(+)
Teacher Education	+		+	+	(+)			
Teacher Professional Development					-	-		
Classroom Social/Educational Environment								
Teacher Quality		+						
Classroom Disruption		-						
Student Psychological Status								
Locus of Control								
Self-Esteem								
Peer Perceptions	+	+						

Note: "+"s and "-"s indicate the direction of all significant relationships found in the Phase II analyses. Signs in parentheses indicate relationships that were significant, but weak (e.g., indicating differences of less than 0.1 of a standard deviation).

Table 7. Two-Level Model with Student-Level and Classroom-Level Variables Predicting Reading Achievement

Fixed Effect	*Coefficient*	*se*	*t ratio*
Classroom mean achievement			
Intercept, γ_{00}	-0.101	0.048	-2.12*
Proportion of Title I Student Pullout, γ_{02}	0.029	0.122	0.24
Content Differentiation, γ_{03}	-0.020	0.045	-0.44
Instructional Time, γ_{04}	0.000	0.000	-1.62
Homework Assigned, γ_{05}	-0.001	0.006	-0.11
Advanced Emphasis, γ_{06}	-0.009	0.055	-0.16
Advanced Materials, γ_{07}	0.094	0.054	1.73
Student-Centered Models, γ_{08}	-0.055	0.052	-1.06
Teacher Education, γ_{09}	0.025	0.048	0.53
Teacher Professional Development, γ_{010}	-0.002	0.056	-0.03
Aide Role, γ_{011}	-0.165	0.050	-3.29**
Title I gap			
Intercept, γ_{10}	-0.159	0.065	-2.46*
Proportion of Title I Student Pullout, γ_{11}	-0.048	0.121	-0.40
Content Differentiation, γ_{12}	-0.052	0.059	-0.88
Instructional Time, γ_{13}	0.000	0.000	0.48
Homework Assigned, γ_{14}	-0.008	0.005	-1.55
Advanced Emphasis, γ_{15}	0.000	0.037	-0.01
Advanced Materials, γ_{16}	0.020	0.053	0.37
Student-Centered Models, γ_{17}	-0.008	0.054	-0.14
Teacher Education, γ_{18}	0.001	0.053	0.02
Teacher Experience, γ_{19}	0.004	0.005	0.68
Teacher Professional Development, γ_{110}	-0.012	0.055	-0.22
Aide Role, γ_{111}	0.013	0.052	0.25
Pretest Differentiation			
Intercept, γ_{20}	0.689	0.048	14.50
External Esteem Differentiation			
Intercept, γ_{30}	0.038	0.016	2.41
SES Differentiation			
Intercept, γ_{40}	0.067	0.015	4.31

Random Effect	*Variance Component*	*df*	*X2*	*p value*
Classroom mean achievement, u_{0j}	0.328	87	1180.12	0.000
Title I gap, u_{1j}	0.046	87	107.01	0.072
Level-1 effect, r_{ij}	0.306			

Note. *p<.05; **p<.01; ***p<.001.

Table 8. Two-Level Model with Student-Level and Classroom-Level Variables Predicting Math Achievement

Fixed Effect	*Coefficient*	*se*	*t ratio*
Classroom mean achievement			
Intercept, γ_{00}	-0.052	0.050	-1.05
Proportion of Title I Student Pullout, γ_{01}	0.068	0.131	0.52
Content Differentiation, γ_{02}	0.035	0.060	0.58
Instructional Time, γ_{03}	0.000	0.000	-2.14*
Homework Assigned, γ_{04}	0.002	0.006	0.41
Advanced Emphasis, γ_{05}	0.009	0.060	0.16
Advanced Materials, γ_{06}	0.058	0.057	1.01
Student-Centered Models, γ_{07}	-0.128	0.058	-2.20*
Teacher Education, γ_{08}	0.015	0.052	0.29
Teacher Experience, γ_{09}	0.008	0.006	1.28
Teacher Professional Development, γ_{010}	0.006	0.053	0.11
Aide Role, γ_{011}	-0.049	0.062	-0.79
Title I gap			
Intercept, γ_{10}	-0.184	0.071	-2.58*
Proportion of Title I Student Pullout, γ_{11}	0.006	0.132	0.05
Content Differentiation, γ_{12}	0.056	0.052	1.07
Instructional Time, γ_{13}	0.000	0.000	1.46
Homework Assigned, γ_{14}	-0.010	0.007	-1.33
Advanced Emphasis, γ_{15}	-0.082	0.069	-1.19
Advanced Materials, γ_{16}	-0.009	0.079	-0.11
Student-Centered Models, γ_{17}	0.049	0.063	0.78
Teacher Education, γ_{18}	-0.097	0.091	-1.07
Teacher Experience, γ_{19}	0.005	0.007	0.81
Teacher Professional Development, γ_{110}	0.003	0.053	0.05
Aide Role, γ_{111}	-0.057	0.067	-0.85
Pretest Differentiation			
Intercept, γ_{20}	0.657	0.052	12.70
External Esteem Differentiation			
Intercept, γ_{30}	0.018	0.019	0.95
SES Differentiation			
Intercept, γ_{40}	0.082	0.022	3.68

Random Effect	*Variance Component*	*Df*	*X2*	*p value*
Classroom mean achievement, u_{0j}	0.254	53	430.53	0.000
Title I gap, u_{1j}	0.039	53	62.73	0.170
Level-1 effect, r_{ij}	0.371			

Note. *p<.05; **p<.01; ***p<.001.

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