A MULTILEVEL EXPLORATORY STUDY OF THE RELATIONSHIP BETWEEN TEACHERS' PERCEPTIONS OF PRINCIPALS' INSTRUCTIONAL SUPPORT AND GROUP NORMS FOR INSTRUCTION IN ELEMENTARY SCHOOLS

ABSTRACT

At a time when educators and policy makers are focused on improving outcomes for all children, we believe it is essential to understand better the ways in which principals may influence instructional norms in their schools. Our literature review led us to believe that a combination of leadership approaches is important for supporting teachers' use of differentiated instruction schoolwide to meet their students' diverse needs. Therefore, we examined whether principals' instructional support predicts differences among schools in group norms for the use of differentiated instruction. Data were drawn from a stratified random sample of a Midwestern state's noncharter public elementary schools. Hierarchical linear modeling results of surveys from 616 teachers in 77 schools revealed a positive and statistically significant relationship between these two constructs. In addition to presenting these findings, we discuss their importance and the need for further research in this area.

Yvonne L. Goddard
TEXAS A&M UNIVERSITY

Christine M. Neumerski
UNIVERSITY OF MICHIGAN

Roger D. Goddard
TEXAS A&M UNIVERSITY

Serena J. Salloum
Daniel Berebitsky
UNIVERSITY OF MICHIGAN

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IT is uncommon to find a school in which teachers report that the principal does not—for better or worse—make a substantial difference in school effectiveness. Indeed, given the central role of teaching and learning in the attainment of current state and federal accountability goals, it seems critical to know more about the ways in which principals might support teachers' instruction. The purpose of this article, therefore, is to examine the link between teachers' reports of their principal's leadership and school norms for instruction—in particular, teachers' perceptions of a common focus on differentiated instruction. This is an exploratory study in which we examine whether this connection exists in a sample of schools that is representative of the elementary school population of a large Midwestern state.

Several researchers have contended that principals should focus on creating school-level conditions that influence teaching and learning at the classroom level (Bossert, Dwyer, Rowan, & Lee, 1982; Heck, Larsen, & Marcoulides, 1990). Particularly, principals should work to foster and sustain schoolwide instructional practices. However, there is a paucity of research examining the ways in which specific aspects of principal leadership may be associated with teachers' instruction or school norms for instructional practice. Notable exceptions include a few recent studies. For example, Supovitz, Sirinides, and May (2010) found that principal leadership centering on instruction, trust, and a clearly communicated school mission was associated positively with teachers' self-reported instructional changes in both English language arts and mathematics. Supovitz et al. further made connections between principals' leadership practices, teachers' instructional changes, and improved student achievement on the state-mandated English language arts assessment. Quinn (2002) observed a high correlation between principal instructional leadership behaviors and student-centered teaching; in contrast, he found principal instructional leadership less likely to impact more traditional teacher-centered instruction. Evidence of a connection between more responsive teaching and leadership encouraged us to consider other ways in which principals may foster schoolwide attention to student needs. To this end, our study examines the link between principal leadership and group norms for instruction in schools. As an exploratory study, we focused particularly on group norms for differentiated instruction, which is a student-centered means of teaching.

We chose to focus on group norms of differentiated instruction for several reasons. First, differentiation is not curriculum dependent; thus, it can be employed with any curriculum. In this approach to instruction, teachers are committed to meeting the needs of all students in their classrooms, regardless of the adopted curriculum in their schools (Hoover & Patton, 2004). In addition, as teachers work increasingly with academically and culturally diverse groups of students, differentiation is considered necessary to meet the various learning needs of all subgroups. Finally, and perhaps most importantly, emerging evidence indicates that differentiated instruction is related to improved academic outcomes for students (Goddard & Goddard, 2007; Simpkins, Mastropieri, & Scruggs, 2009; Sternberg, Torff, & Grigorenko, 1998; Tieso, 2005). In sum, we recognize that differentiated instruction is not the only way to consider teaching; however, it provides a research-supported perspective through which to consider school norms for instructional practice that is curriculum independent and designed to meet the learning needs of all students, and for which emerging evidence shows a positive relationship to student achievement.

We turn next to a review of the literature examining leadership and differentiated instruction in more detail.

Literature Review

At a time in the history of public schools and education policy that requires an unprecedentedly intense focus on improving outcomes for all children, we believe it is essential to better understand the ways in which principals may influence their teachers' instruction. To this end, our review begins by examining literature specific to instructional and transformational leadership because these constructs are often presented in the literature separately when, in fact, emerging research considers that they may be tightly linked. Next, we turn to a review of the research on differentiated instruction and its effects in order to provide warrant for its importance in this analysis. Following that, we examine research that suggests leadership plays an important role in supporting the effective use of differentiated instruction in schools. Linking these literatures, we argue that principals' instructional support should be positively related to the degree to which schools have strong norms for differentiated instruction. We summarize the literature review by elaborating our rationale for this hypothesis. Our goal is to explain that transformational and instructional leadership practices overlap conceptually and empirically and, when considered simultaneously, provide a strong foundation for our measure of principals' instructional support. Further, we explain why principals' instructional support should be related to schoolwide norms around differentiated instruction, which researchers have empirically linked to desirable outcomes (Page, 2000; Pettig, 2000; Tomlinson et al., 2003), not the least of which is student achievement (Goddard & Goddard, 2007; Simpkins et al., 2009; Sternberg et al., 1998; Tieso, 2005).

Instructional and Transformational Leadership

Our conceptualization of principals' instructional support, as measured by our survey items, draws directly from two of the more dominant theories of education leadership in the literature—instructional and transformational. Instructional leadership generally refers to the management and improvement of teaching and learning, including the nature of the work principals engage in to support such improvement. In contrast, transformational leadership describes the work of leaders to deepen the motivation, commitment, and dedication of group members to organizational goals. Transformational leaders empower group members to deploy their capacity and personal commitment toward reaching organizational goals. Indeed, according to the findings of Marks and Printy (2003), a combination of the two approaches may be most effective. In the following paragraphs, we present each leadership approach separately, then review the literature connecting the two constructs.

Instructional leadership refers to managing and leading the school's technical core, that is, teaching and learning. The idea emerged from the effective schools movement of the 1970s (Brookover & Lezotte, 1979; Edmonds & Frederiksen, 1978; Lezotte, 2001), when researchers found that effective schools typically had principals who functioned as instructional leaders. Initial studies tended to focus on the characteristics of instructional leaders (Elmore, 2000; Heck et al., 1990), describing them

as charismatic or strong, directive leaders (Edmonds, 1979; Hallinger & Murphy, 1986). These studies viewed the principal as the sole instructional leader, reinforcing a romantic idea of the heroic school leader (Hallinger, 2005; Marks & Printy, 2003; Robinson, Lloyd, & Rowe, 2008). More recent studies have broadened our understanding of instructional leaders to include others beside the principal, such as teachers and department chairs (Marks & Printy, 2003; Robinson et al., 2008).

Although there is no universally accepted definition of instructional leadership, there are several commonalities that emerge from the literature. For example, most researchers agree that the principal should be responsible for the school's instructional program and focus on academic outcomes (Banburg & Andrews, 1990; Hallinger, 1992; Hallinger & Murphy, 1986). Furthermore, several researchers have argued that the principal should know about the curriculum and should work to make instructional improvements (Banburg & Andrews, 1990; Hallinger, 1992, 2003; Hallinger & Murphy, 1986). Others contend that instructional leaders should hold high expectations for both students and teachers (Bossert et al., 1982; Hallinger, 2005; Heck et al., 1990; Marks & Printy, 2003; Mortimore, 1993; Purkey & Smith, 1983; Rosenholtz, 1985), and they should closely monitor instruction, curriculum, and student progress (Banburg & Andrews, 1990; Hallinger, 1992, 2003; Tyack & Hansot, 1982).

Although we do not seek to contribute to a definition of instructional leadership, we draw on aspects of this construct in our conceptualization of principals' instructional support. Specifically, we refer to Hallinger's (2005) model of instructional leadership in our measure of principals' instructional support. Hallinger (2005) recently conducted a meta-analytic review of the literature in which he proposed an instructional leadership model consisting of three underlying dimensions: (1) defining the school's mission, (2) managing the instructional program, and (3) promoting a positive school-learning climate. More specifically, Hallinger identified a subset of behaviors and actions that instructional leaders do to lead in ways that address teaching and learning. For example, to address Hallinger's first dimension, defining a school's mission, instructional leaders should communicate and model clear goals around academic progress. To manage the instructional program, the principal should be "deeply engaged in stimulating, supervising, and monitoring teaching and learning in the school" (Hallinger, 2005, p. 226). This means principals should coordinate instruction and curriculum, and should have expertise in teaching in order to do so. Finally, promoting a positive learning climate involves the principal modeling the types of values and practices necessary for supporting instructional improvement. The principal should take actions such as developing and maintaining high expectations and standards, and providing incentives for learning.

In addition to instructional leadership, our measure of principals' instructional support draws upon concepts embedded within transformational leadership. Originating with Burns's (1978) seminal article, the term *transformational leadership* implies the ability to foster capacity and personal commitment, transforming followers and increasing their motivation, performance, and ability to help one another and their organization. The idea became popular in the late 1980s and early 1990s as a reaction to top-down school policies and the idea of the "directive" instructional leader (Hallinger, 2003). Furthermore, interest in transformational leadership was spurred by an increasing focus on school restructuring (Hallinger, 2003; Leithwood & Jantzi, 2005). The idea of restructuring—that principals could transform their

schools into new and improved organizations—included an emphasis on collaborative problem solving and capacity building (Hallinger, 1992). Decentralization also was crucial, as teachers were expected to take on more decision making to orchestrate the transformation (Leithwood, 1994). From the perspective of transformational leadership, school principals should not make decisions in isolation, as was common with the notion of instructional leadership, but should be a "leader of leaders." So too, the principal would not take direct control and supervision of instruction (Hallinger, 2003). Instead, transformational leaders would engage with staff in ways that inspired them to new levels of energy, commitment, and purpose. In turn, such inspiration was expected to lead to enhancement of organizational capacity to overcome intractable challenges that principals alone had not previously solved (Robinson et al., 2008).

As with instructional leadership, no one canonical definition of transformational leadership prevails. However, much of the foundational work on this construct was done by Bass and Avolio (1994) and Leithwood (1994). The most frequently cited work on transformational leadership is by Bass, who viewed transformational leaders as those who inspire followers to achieve extraordinary goals and, in the process, develop their own capacity (Marks & Printy, 2003). Such leaders align the objectives and goals of individuals with those of the organization. Basing his work on Burns's earlier ideas, Bass coined the four I's of transformational leadership: (1) *idealized influence,* in which transformational leaders build trust in order to make organizational changes and become role models for their followers (Avolio, 1994; Bass, Avolio, Jung, & Berson, 2003; Bass & Riggio, 2006; Hoy & Miskel, 2005); (2) *inspirational motivation,* in which transformational leaders develop an attainable vision, motivating and inspiring followers to do more than they originally planned (Avolio, Bass, & Jung, 1999; Bass & Riggio, 2006; Hoy & Miskel, 2005; Marks & Printy, 2003); (3) *intellectual stimulation,* in which transformational leaders use innovation and creativity to encourage followers to question traditions and try new approaches to their work without criticism (Bass & Avolio, 1994; Hoy & Miskel, 2005); and (4) *individualized consideration,* in which transformational leaders act as coaches or mentors, establish learning opportunities, listen actively, and help individuals take responsibility for their own development (Antonakis, Avolio, & Sivasubramania, 2003; Bass & Riggio, 2006; Hoy & Miskel, 2005; Marks & Printy, 2003).

Leithwood made some of the most significant advances in further conceptualizing Bass's work (Hallinger, 2003). Specifically, Leithwood and Jantzi (1999) considered six components of transformational leadership: (1) holding high performance expectations, (2) building school vision and goals, (3) providing intellectual stimulation, (4) offering individualized support, (5) symbolizing professional practices and values, and (6) developing structures to foster participation in school decisions. Again, the assumption behind this conceptualization is that the principal may share leadership and that change may emerge from the bottom up, as opposed to from the top down (Hallinger, 2003).

Bass and Leithwood's work supports our conceptualization of principals' instructional support by indicating that sharing decisions, a construct included in our survey items, is one key to transforming individuals and organizations. At the same time, a combination of instructional and transformational leadership seems important.

This combined approach was recently investigated by Robinson et al. (2008), who conducted two meta-analyses examining various leadership practices on student outcomes. In the first meta-analysis, the authors examined 22 studies and summarized five leadership practices measured via surveys in these studies: establishing goals and expectations; resourcing strategically; planning, coordinating, and evaluating teaching and the curriculum; promoting and participating in teacher learning and development; and ensuring an orderly and supportive environment. Robinson et al. (2008) concluded that instructional leadership has an impact on student outcomes of three to four times that of transformational leadership. The second meta-analysis compared the relative effects of these five leadership practices on student outcomes and determined that leaders' promotion of and participation in teacher learning and development had the strongest association with positive student outcomes. These scholars also concluded that transformational leadership, primarily through relationship building, is critical, and that school leaders should be more involved in teaching and learning (i.e., instructional leadership) to impact student outcomes in positive ways.

Fortunately, the study of school leadership is not constrained by a choice between instructional and transformational perspectives. Indeed, recent scholarship suggests that transformational and instructional leadership should not be viewed in isolation, but rather as mutually supportive when integrated (Marks & Printy, 2003; Printy, Marks, & Bowers, 2009). Importantly, Marks and Printy (2003) observed that traditional views of instructional leadership, most notably the heroic principal, rest influence over a school's instructional program only in the hands of the principal. They argued for an expanded perspective, which they called *shared instructional leadership,* between leaders and followers. The integration of instructional leadership and transformational leadership emphasizes the importance of principals and teachers working together to improve instruction.

Marks and Printy (2003) observed that transformational and instructional leadership have traditionally been viewed separately. Printy et al. (2009) expanded this understanding to acknowledge that although it may be necessary to isolate leadership practices for quantitative analyses, it is difficult to disentangle transformational and instructional leadership in day-to-day work. Transformational and instructional leadership are interdependent, and each type of leadership is insufficient on its own. Specifically, leaders who are exclusively transformational might focus on vision building and member involvement around mutually created organizational purpose, but lack attention to teaching and learning. In contrast, instructional leaders are likely to focus on instruction, curriculum, and assessment issues without considering how to motivate teachers. Marks and Printy (2003) theorized that efficacious principals are skilled at both types of leadership. In fact, they found that transformational leadership was necessary to lead schools through reform but was an insufficient approach to transforming schools in the absence of instructional leadership. When these two types of leadership coexist, principals invite teachers to share in their leadership functions, leading teachers to grow "in commitment, professional involvement, and willingness to innovate" (Marks & Printy, 2003, p. 393). An integrated approach to leadership suggests that principals could do well to lead transformationally while also focusing on instruction.

In sum, our literature review revealed that instructional and transformational leadership are jointly important for improving student outcomes. Given the prevalence of

instructional and transformational perspectives in the empirical literature, we designed a measure of principals' instructional support that draws on both constructs and examined how this measure related to school norms for differentiated instructional practice, which we turn to next. As we summarized above, despite the great deal of work arguing for the importance of school leadership, few studies specifically examine the association between the instructional support principals provide and prevailing norms for instructional practice. Even fewer studies investigate the ways in which principals support specific types of instruction. The goal of this article, therefore, is to explore the connection between principals' instructional support and school norms for differentiated instruction. We turn now to a discussion of differentiated instruction as a pedagogical approach.

Differentiated Instruction

Broadly construed, differentiated instruction is an approach teachers may use to educate the academically diverse populations of students in their classrooms. Tomlinson et al. (2003) referred to differentiated instruction as academically responsive instruction. Differentiated instruction requires teachers to consider a multitude of student characteristics when designing lessons and units. For the purposes of this study, we chose to focus on students' needs, skills, and interests, as these are integral to differentiated instruction, salient to teaching diverse students, and most relevant in conducting an exploration of school norms for differentiated instruction.

Students' readiness levels involve having them work within their zone of proximal development (Vygotsky, 1978, 1986), meaning that to accomplish a new skill or task they require some teacher support. In this way, teachers address students' learning needs by assessing their readiness and providing support as they learn new skills. Teachers can motivate students by creating activities that interest them (Simpkins et al., 2009). These might include project-based learning or teachers using their knowledge of students' interests to create learning opportunities or assignments from which students can choose. Finally, tracking student progress, especially for the purpose of designing student-centered lessons, is important when teaching in ways that meet students' academic needs (Bransford, Brown, & Cocking, 1999; Tomlinson et al., 2003). In sum, teachers who take the time to differentiate instruction in their classrooms consider students' needs, interests, and skills and reflect on students' progress as they plan lessons and units.

Rather than focusing on merely teaching content, teachers who differentiate must consider teaching content by focusing on students' learning needs (Hoover & Patton, 2004; Simpkins et al., 2009; Sternberg et al., 1998). Teachers who embrace this approach provide multiple means for students to access and process content, they make available a variety of activities from which students can choose according to their interests and abilities, and they allow students to demonstrate their learning in diverse ways. In classrooms where differentiated instruction is optimized, teachers design opportunities for success and provide scaffolding when students are being pushed to learn new content and skills. All students in these classrooms are held to high expectations in a climate that supports students' academic needs.

Notably, there is emerging support for the effectiveness of differentiated instruction that is promising. Goddard and Goddard (2007) collected survey data from faculty in a representative sample of a state's public elementary schools. They found that teachers' reports of their use of differentiated instruction were positively and

significantly associated with student achievement in both mathematics and reading on state-mandated assessments. Simpkins et al. (2009) conducted a crossover experiment in which each of three grade 5 science classrooms were assigned to treatment and control for different instructional units across the school year. Students in the experimental condition received differentiated curriculum enhancements in a class-wide peer tutoring format. Students in the control condition received "typical" instruction involving lecture, discussion, textbook reading, and worksheet completion. Simpkins et al. found that students in the experimental condition scored higher on production tests (assessments requiring students to provide, rather than select, information) than their peers in the control condition. Similarly, Sternberg et al. (1998) found that third- and fifth-grade students who were taught using "triarchic instruction" showed greater achievement on memory- and performance-based assessments than their peers who were taught using one of two more "traditional" instructional methods. Triarchic instruction involves a combination of analytic, creative, and practical tasks designed to match students' patterns of strengths, some features of which overlap with differentiated instruction practices. In related work, Tieso (2005) used a stratified random sample of teachers from four New England school districts and their students to examine the effects of differentiated versus nondifferentiated instruction, combined with various grouping structures, on mathematics achievement. Differentiated math instruction involved preassessing students, using flexible grouping, and providing differential levels of depth (lessons for different ability levels) and breadth (varying interest, choices, and learning style) of the math curriculum based on students' performance on the preassessment. Students who were exposed to a differentiated math curriculum, combined with within- and between-class ability grouping, experienced significantly higher math achievement than those exposed to the undifferentiated textbook unit. In sum, we identified differentiated instruction as an approach to teaching that is implemented irrespective of the curriculum adopted in a school (Gray & Waggoner, 2002; Hoover & Patton, 2004) and that has promising research support for its efficacy (Goddard & Goddard, 2007; Simpkins et al., 2009; Sternberg et al., 1998; Tieso, 2005).

Leadership to Support Differentiated Instruction

Those who have implemented differentiated instruction suggest that a long-range implementation plan, with time for sustained collaboration and evaluation, is necessary to encourage teachers as they differentiate instruction in their classrooms (McAdamis, 2001; Page, 2000; Pettig, 2000). For example, McAdamis (2001) described her district's implementation of differentiated instruction and noted that after 5 years, most elementary and middle school teachers were differentiating regularly. Further, she discussed the importance of leadership support from curriculum coordinators, principals, and even peers. Page (2000) described how middle school teachers worked hard for 3 years over the summers and during the school years to differentiate units for all subjects. Similar to McAdamis (2001), Page (2000) indicated the necessity of administrative support for teachers as they worked to differentiate instruction for their students. Pettig (2000) stressed that differentiating instruction is not a "quick fix." Instead, it requires significant, systemic change that takes a great deal of time and work. These authors have suggested that leaders should support teachers as they enact differentiation at their own pace. Some teachers are

comfortable making changes to a lesson or unit per grading period. Others may be at ease changing several lessons or units per term. School leaders should therefore be willing to support teachers' diverse attempts at differentiating instruction over a prolonged period of time. Implementing and sustaining this approach to instruction can be quite challenging, so leadership support is vital (Tomlinson & Allan, 2000).

Carolan and Guinn (2007) suggested the need for leadership support for differentiating instruction. They studied several middle school classrooms and found that many teachers did not differentiate instruction because they lacked time, professional development resources, and, notably, the administrative support for doing so. Tomlinson (2004) summarized research showing that teachers are generally disinclined to differentiate instruction for a variety of reasons, including time constraints, unawareness of students' needs, and a tendency to shift responsibility to "specialists." This was true in their study across a range of students, including those with identified disabilities, those from various multicultural backgrounds, and those who were gifted and talented. In a related study, Westberg and Archambault (1997) studied 46 classrooms with a reputation for differentiating instruction for high-ability learners in 10 urban, suburban, and rural elementary schools from across the United States. After conducting in-depth case studies at each school, the researchers discovered several themes that emerged across schools and classrooms. Among these themes was the need for administrative support. In some cases, the principal's support for risk taking and change was cited as supporting teachers' autonomy. Principals' creation of a culture of collaboration as providing necessary support was cited as important to teachers as they strove to change their approaches to teaching.

Finally, a principal's support for differentiating instruction is related to successful implementation. In a qualitative study of three schools over the course of 3 years, Hertberg-Davis and Brighton (2006) examined the characteristics of principals that impacted teachers' willingness and ability to differentiate instruction. They found that principal support was a key to teachers' willingness to differentiate instruction. Principals who were most successful in encouraging their teachers to differentiate were supportive, believed that change was possible, and understood that differentiation is a long-term process.

In sum, principal support of instruction is vital to teachers' use of differentiated instruction (Carolan & Guinn, 2007; McAdamis, 2001; Page, 2000; Pettig, 2000; Quinn, 2002; Supovitz et al., 2010; Tomlinson & Allan, 2000; Westberg & Archambault, 1997). Although the studies presented here illustrate the need for school leaders' support, they do not demonstrate a statistically significant link between teachers' reports of principal support for instruction and schoolwide norms around differentiated instruction—a gap in the literature that our study addresses.

Rationale for Hypothesis

Based on our literature review, we asked whether teachers' reports of the extent to which their principals provided instructional support was associated with teachers' perceptions of the use of differentiated instruction schoolwide. In this section, we present a rationale for our focus on differentiated instruction as a school norm. Following that, we provide a brief alignment of our measures with the literature (for a more in-depth presentation linking the items we used for each measure with the extant literature, see App. A). Because this study is exploratory and the literature

related to our measures is expansive, we believe it prudent to indicate how our measures are conceptually and empirically consistent with the extant literature. We close by stating the hypothesis for our study.

Differentiation as a School Norm

Our literature review suggests that principals' instructional support is important for establishing and maintaining differentiated instruction in their schools (Carolan & Guinn, 2007; McAdamis, 2001; Page, 2000; Pettig, 2000; Quinn, 2002; Supovitz et al., 2010; Tomlinson & Allan, 2000; Westberg & Archambault, 1997). As we were unable to measure teachers' use of differentiated instruction in the classroom directly, we focused on teachers' perceived use of differentiated instruction schoolwide. Notably, it is well established in the sociological and organizational studies literature that such shared perceptions are indicative of group norms for behavior (e.g., Coleman, 1990; Goddard, 2002; Goddard, Sweetland, & Hoy, 2000). Norms, which represent the unwritten and informal expectations in a school's social system, socialize members to behave in ways that are consistent with the beliefs of the group (Coleman, 1990; Hoy & Miskel, 2005). If a group norm supporting differentiated instruction exists in a school, then the teachers of that school will be strongly encouraged to implement the instructional practice. By focusing on a group norm in this study, we were able to assess whether or not principal support for instruction fostered a schoolwide belief in the use of differentiated instruction.

Measuring Principals' Instructional Support

Our measure of principals' instructional support was drawn from literature examining instructional and transformational leadership, both separately (Bass & Avolio, 1994; Hallinger, 2005; Leithwood & Jantzi, 1999) and in combination (Marks & Printy, 2003; Robinson et al., 2008). To tap the construct of principals' instructional support, we asked teachers to rate the extent to which (*a*) their principal helps them with their instructional practices (Banburg & Andrews, 1990; Hallinger, 1992, 2005; Hallinger & Murphy, 1986; Heck et al., 1990; Marks & Printy, 2003), (*b*) they feel comfortable discussing instructional issues with their principal (Antonakis et al., 2003; Bass & Avolio, 1994; Bass & Riggio, 2006; Leithwood & Jantzi, 1999; Marks & Printy, 2003), and (*c*) their principal empowers them to make decisions focused on teaching and learning (Bass & Avolio, 1994; Leithwood & Jantzi, 1999).

Measuring Differentiated Instruction

We measured the degree to which there was a perceived schoolwide focus on differentiated instruction by asking teachers to respond to items that drew upon the extant literature (Bransford et al., 1999; Sternberg et al., 1998; Tomlinson et al., 2003; Vygotsky, 1978, 1986), without using the term *differentiated instruction* in our survey items, as the construct is often misunderstood (Tomlinson et al., 2003). Specifically, we asked teachers to indicate the extent to which teachers in their schools (*a*) offer a wide range of assignments designed to address students' needs and skills (Bransford et al., 1999; Tomlinson et al., 2003; Vygotsky, 1978, 1986), (*b*) recognize all students' individual progress (Bransford et al., 1999; Sternberg et al., 1998), and (*c*) provide

varied activities that students can choose among (Sternberg et al., 1998; Tomlinson et al., 2003).

In sum, our literature review on principals' instructional leadership led us to believe that a combination of instructional and transformational leadership is likely more effective at bringing about instructional change in schools than either approach alone. Further, the literature on differentiated instruction suggests that teachers can use this approach to meet the needs, interests, and skill levels of their students and that leadership support is important. Therefore, we hypothesized that principals' instructional support would be positively and significantly associated with differences among schools in the strength of norms for differentiated instruction.

Method

In order to test our hypothesis that teachers' reports of principals' instructional support is related to schoolwide norms of the use of differentiated instruction, we conducted a quantitative investigation in which we employed hierarchical linear modeling (HLM) as our primary analytic technique (Raudenbush & Bryk, 2002). In this section, we describe the method used to select schools for inclusion in the study, the variables we employed, and our use of HLM to answer our research question.

Sample

Data were drawn from a stratified random sample of Michigan's noncharter public elementary schools in 2004–2005. We ensured that all schools in this analysis contained at least fourth and fifth grades and no students above sixth grade, resulting in 1,659 eligible schools. Schools were placed into strata based on four measures: geographic location within the state of Michigan, school size, proportion of the student body eligible for free and reduced-price lunch, and prior achievement as measured by the percentage of students passing the Michigan Educational Assessment Program (MEAP), an assessment used for state accountability purposes. From this stratified sample, 130 schools were randomly selected, and teachers in 80 schools completed surveys for a school response rate of 62%.

Analyses were conducted on the stratifying variables employed for school selection, and the schools in the sample were not statistically different on any of these variables from the schools that declined participation; therefore, the sample was statistically representative of the state's population of noncharter elementary schools on the four stratification measures. Low response rates and missing data on the differentiated instruction and principals' instructional support survey items led us to drop three schools from the analysis; however, the remaining sample of 77 schools also did not differ from the excluded schools on any of the stratifying variables.

We also constructed weights to account for school-level nonresponse. The weights were computed using logistic regression to approximate the inverse of the estimated response propensities from a logistic regression, while the stratification variables served as controls. Two of the schools had excessively large weights and were trimmed down to the next highest school weight; this procedure was supported with analyses confirming that the trimming resulted in negligible effects on point

estimates for survey variables. All quantitative analyses were performed using these weights. We obtained a final analytic sample of 616 teachers in 77 schools.

Teachers were administered a survey that contained items related to their perceptions of differentiated instruction use in their schools and reports of their school leader's instructional support. The survey also contained many other measures not reported in this study, as the surveys were nested within a larger investigation. Principals were instructed to administer the survey during regularly scheduled staff meetings. During survey administration, teachers drew one of two randomly assigned surveys. The two forms of the survey were designed specifically to contain related items pertinent to the scope of the larger investigation; one form included the data employed for this study. Thus, our survey was designed to obtain responses from a random sample of approximately half of the teachers in a school. With an average of eight teacher responses per school in this survey, and considering the possibility of nonresponse due to absence during survey administration, our ratio of responses was consistent with national student-to-pupil averages and indicated an extremely high degree of participation in the survey on the part of teachers. Once the surveys were completed, they were returned directly to our research team, but individual identifiers were coded to maintain the confidentiality of the respondents, eliminating the opportunity to follow up with nonresponders.

Teacher-Level Variables

The outcome of this analysis was a measure of teachers' perceptions of the degree to which differentiated instruction was employed in their schools, and thus the degree to which differentiation was normative. As discussed above, individual teachers reported the extent to which teachers in their school made special efforts to recognize all students' individual progress, provide several different activities in class so that students could choose among them, and offer a wide range of assignments matched to students' needs and skill levels. Teachers responded to each of the three items on a five-point Likert scale that ranged from strongly agree (5) to strongly disagree (1). These items are consistent with the measurement of differentiated instruction in previous research (e.g., Goddard & Goddard, 2007). Because this study is exploratory, we recognize that these items do not represent an exhaustive list of possible indicators of differentiated instruction. However, we argue that recognizing individual progress, promoting student choice, and tailoring assignments and assessment to student needs and interests are critical components of differentiated instruction and that, therefore, the items do tap the degree to which teachers perceived the use of differentiated instruction in their schools. These variables were combined at the teacher level in a principal components factor analysis to examine their covariance.

After construction of this variable at the teacher level, we included a number of covariates, which may be important determinants of a teacher's use of differentiated instruction. Specifically, we included covariates for teachers' gender, minority status (whether or not the teacher was white), and educational attainment (whether or not the teacher held a master's degree). We included these covariates because no prior work has examined the ways in which demographic background variables are related to the use of differentiated instruction.

School-Level Variables

To test our hypothesis, we focused on teachers' reports of the degree to which their principals provide instructional support. Specifically, teachers reported the extent to which principals helped them with instruction, empowered them to make decisions that affect teaching and learning, and made them feel comfortable discussing instructional issues. As with the earlier items, teachers responded on a five-point Likert scale that ranged from strongly agree (5) to strongly disagree (1). We aggregated individual responses to the school level and then conducted a factor analysis and reliability analysis. The factor analysis allowed us to combine the items to represent a single construct that measured teachers' reports of their principals' instructional support. Similar to our differentiated instruction measure, these items do not include all possible ways a principal might support instruction; however, the items are conceptually consistent with the literature on instructional and transformational leadership and the argument that effective leaders might need to exhibit behaviors that are consistent with both (Marks & Printy, 2003). At the school level, we controlled for school size, percent minority students, percent of students eligible for free or reduced-price lunch (a proxy for socioeconomic status), and prior achievement (measured by the prior year's MEAP fourth-grade reading pass rate). By controlling for the school context in this way, we hoped to parse out the specific effect of teachers' reports of principals' instructional support on their perceived use of differentiated instruction schoolwide. We reasoned that if differentiated instruction was related to student achievement, it was important to have a control for prior achievement so as to not underspecify our model and inflate our estimate of the effect of principal leadership. Therefore, we included several of the variables that served as stratifiers in our sample design as statistical controls in our full model to test the null hypothesis that they were unrelated to the outcome.

Analytic Method

We were interested in teachers' perceptions of the schoolwide norms of the instruction at their school and the relationship between this and teachers' reports of the principal's instructional support. Our variables encompass two levels of analysis: the individual teacher and the school. Because our data contain teachers nested in schools, we employed HLM (Raundenbush & Bryk, 2002) to test the relationship between reports of principal support and perceived schoolwide differentiated instruction. HLM allowed us to parse out the variance in teachers' estimates of differentiated instruction in the school at both the teacher and school levels and to examine influences on each. The advantages of HLM include avoiding single-level models, which misestimate the standard errors of point estimates and therefore bias statistical inference tests by violating the independence assumption of regression: teachers in the same school are not independent of one another in their responses to questions because they share the sociological and demographic influences of common school membership (Raudenbush & Bryk, 2002).

Results

The measure of perceived use of differentiated instruction and the principal instructional support constructs were created through separate exploratory principal components

Table 1. Differentiated Instruction Items and Loadings

Items	Loadings
Teachers in this school offer a wide range of assignments, matched to students' needs and skill level.	.832
Teachers in this school make special efforts to recognize all students' individual progress, including the low achievers.	.775
Teachers in this school often provide several different activities in class so that students can choose among them.	.702

Note.—The differentiated instruction factor items have an eigenvalue of 1.79 and a Cronbach's alpha of .65, and the factor explains 59.50% of the total item variance.

analyses. Only the three items specific to each construct were included in the factor analyses. The differentiated instruction measure contained items with factor loadings ranging from .70 to .83 and explained 60% of the total item variance. The items had an eigenvalue of 1.79 and a Cronbach's alpha of .65 (Table 1). The factor analysis for the principal instructional support measure resulted in factor loadings ranging from .82 to .90, explaining 75% of the item variance. The items had an eigenvalue of 2.26 and a Cronbach's alpha of .83 (Table 2).

Table 3 displays our descriptive results: of our 616 sampled elementary teachers, 88% were female, 7% were minority, and 61% held a master's degree or higher. At the school level, the mean school size was roughly 375 students in grades K–6; however, enrollment varied, with one school having as few as 82 students and one having 676 students. Similarly, the proportion of minority students and proportion of students eligible for free or reduced-price lunch had quite a wide range. On average, schools had 23% minority students and 41% of students eligible for subsidized lunch. Our measure of school-level prior achievement, the proportion of fourth graders passing the prior year state reading assessment, indicated that most schools had a high passing percentage (mean of 81%); however, some schools struggled more as indicated by the minimum passing rate of 43%.

In order to facilitate exploration of the relationship between the degree to which teachers perceive the schoolwide use of differentiated instruction and principals' instructional support, we also investigated the bivariate associations of the variables in the model at both the school and teacher levels before proceeding to the multilevel analysis. Pearson correlations at the teacher level revealed no significant associations between teachers' perceptions of the use of differentiated instruction in their schools and teachers' sociodemographic status (Table 4). Thus, the degree to which teachers perceived the use of differentiated instruction at their schools had no relationship to their minority status or educational attainment. Although we had no alternative hypotheses, it is worth noting that teachers' race and education levels were unrelated

Table 2. Principal Support for Instruction Items and Factor Loadings

Items	Loadings
Our principal helps me with my instructional practices.	.900
I feel comfortable discussing instructional issues with our principal.	.883
The principal empowers teachers to make decisions that improve teaching and learning.	.820

Note.—The principal instruction factor items have an eigenvalue of 2.26 and a Cronbach's alpha of .83, and the factor explains 75.38% of the total item variance.

Table 3. Descriptive Statistics ($N = 616$ Teachers, 77 Schools)

Variable	Min	Max	Mean	*SD*
Teacher level:				
Female	0	1	.88	.33
Minority	0	1	.07	.25
Master's or more	0	1	.61	.49
Differentiated instruction	−4.55	1.94	0	1
School level:				
School size	82	676	377.30	115.12
Proportion of minority students	0	1.00	.23	.30
Proportion of students eligible for free or reduced-price lunch	.01	.98	.41	.26
Proportion passing reading 2004	.43	1.00	.81	.12
Principal support for instruction	−2.66	1.64	.02	1.02

to the degree to which they indicated that differentiated instruction was normative in their schools. At the school level, Pearson correlations revealed no significant associations between teachers' reports of principals' instructional support and measures of school context (Table 5). In other words, the extent to which teachers perceived that their principals supported instruction in this representative sample did not depend on the sociodemographic context of the schools they served. Correlations also did not reveal any multicollinearity issues among the independent variables.

The intraclass correlation coefficient from the fully unconditional model indicated that 11.5% of the variance in teachers' perceptions of differentiated instruction occurred between schools (Table 6), thus warranting an exploration of influences on the between-school differences. Our full model (Table 7) indicated that teachers did not vary in perceptions of differentiated instruction use on the basis of gender, race, or educational attainment.

At the school level, our main hypothesis was confirmed; a one standard deviation increase in teachers' reports of their principals' instructional support was related to a .11 standard deviation increase in the extent to which teachers perceived the use of differentiated instruction in their schools. However, none of the school-level controls had a significant association with the outcome measure. Although it is not unreasonable to speculate that school social context influenced instruction, in this analysis the most important predictor of teachers' perceptions of differentiated instruction schoolwide was teachers' reports of principal leadership; the contextual measures describing the student body were unrelated to the outcome. In other words, the results of this analysis suggest that principal leadership was more strongly related to differences among schools in the degree to which differentiated instruction was a norm than school demographics, including SES and minority composition. Compared to the fully

Table 4. Teacher Correlations ($N = 1{,}278$ Teachers)

Variable	Gender	Minority	Master's or More
Minority	−.062*		
Master's or more	.100***	.065*	
Differentiated instruction	−.012	−.004	.042

* $p \leq .05$.
*** $p \leq .001$.

Table 5. School Correlations ($N = 77$ Schools)

Variable	Principal Support for Instruction	% Passing Reading	% Free/Reduced Lunch	% Minority
% passing reading	.078			
% free/reduced lunch	−.091	−.486***		
% minority	.049	−.338**	.520***	
School size	.123	.022	−.188	.041

** $p \leq .01$.
*** $p \leq .001$.

unconditional model, our full model explained 19% of the between-school variance and approximately 2% of the within-school variance.

Discussion

Our findings contribute to the extant literature by demonstrating that teachers' reports of their principal's instructional support significantly and positively predicted the degree to which differentiated instruction was a norm in their schools. Specifically, a one standard deviation increase in teachers' reports of principal support resulted in a statistically significant .11 standard deviation increase in teachers' assessment of the degree to which instruction was differentiated in their schools. With this statistically significant link, our findings expand upon the results of qualitative studies, which suggested that leadership was a key factor in teachers' implementation of differentiated instruction (McAdamis, 2001; Page, 2000; Pettig, 2000; Tomlinson & Allan, 2000). They also extend the work done by several authors whose findings indicate that leaders should be closely involved with instruction, curriculum, and student outcomes (Banburg & Andrews, 1990; Hallinger, 1992, 2003; Quinn, 2002; Robinson et al., 2008; Supovitz et al., 2010; Tyack & Hansot, 1982). Further, our findings support emerging research, which has shown that principals can and should be instructional and transformational leaders simultaneously (Marks & Printy, 2003; Printy et al., 2009; Robinson et al., 2008). By combining items that are consistent with

Table 6. HLM Statistics from Fully Unconditional Model (FUM) and Full Model

	Statistic
FUM:	
Within-school variance (σ^2)	.928
Between-school variance (τ_{00})[a]	.121
Reliability (ρ)	.500
Intraclass correlation coefficient	.115
Full model:	
Within-school variance (σ^2)	.905
Between-school variance (τ_{00})	.098
Reliability (ρ)	.419
Explained variance	.190

Note.—Our model explains 19% of the between-school variance of our outcome.

[a] The between-school variance is significant with a chi-square of 156.541.

Table 7. Full HLM Analysis of the Relationship of Teacher and School Characteristics to Differentiated Instruction ($N = 637$ Teachers, 77 Schools)

	Coefficient	*SE*	*t* ratio
Teacher level:			
Intercept	.091	.120	.757
Female	−.159	.111	−1.429
Minority	.074	.172	.428
Master's or more	.059	.087	.675
School level:			
School size[a]	−.067	0.062	−1.079
Proportion of minority students[a]	−.098	.081	−1.213
Proportion of students eligible for free or reduced-price lunch[a]	−.060	.082	−.727
Proportion passing reading 2004[a]	−.022	.079	−.278
Principal support for instruction	.108*	.048	2.248

Note.—All teacher- and school-level variables are uncentered.

* $p < .05$.

[a] Variable standardized to have a mean of 0 and a standard deviation of 1.

the literatures on both instructional and transformational leadership, findings related to our measure of principal instructional support are consistent with those of Robinson et al. (2008) and Printy et al. (2009), who pointed out that both transformational and instructional leadership are important for improving instruction in schools.

While our results may at first seem to support an important, albeit modest, connection between reported principal leadership and teachers' perceptions of differentiated instruction use in their schools, it is possible that more robust connections exist and could be detected by researchers with more sophisticated measures. At a minimum, because our findings are taken from a sample rigorously constructed to provide results that generalize to the population of elementary schools in one of the largest U.S. states, a reasonable conclusion is that principals who focus on instruction have the potential to promote school norms for differentiated instruction.

A limitation of our study is that each of our measures was constructed with three survey items. Thus, we view this as an exploratory effort. Although our measures are based on three items each, it is not uncommon in educational research for measures to contain as few as two items (e.g., Raudenbush, Rowan, & Cheong, 1992). Indeed, we find hope in the fact that over 30 years of research on teacher efficacy began with a two-item measure constructed by RAND (Armor et al., 1976; Berman, McLaughlin, Bass, Pauly, & Zellman, 1977). At the same time, we recognize that the complexities involved in teaching, including differentiated instruction, may be more thoroughly assessed through additional means, including observations. Even so, the relationship evidenced in this study signals that school leadership can serve to promote norms for instruction.

Although we focused explicitly on teachers' reports of their principal's support for instructional improvement and teachers' perceptions regarding group norms for differentiating instruction, inductively our findings suggest that principal leadership has the potential to positively influence the ways teachers teach. Specifically, this study illustrates that when teachers perceive that principals empower teachers' instructional decision making, create an environment in which teachers are com-

fortable discussing instruction with their principal, and help with instruction, teachers are more likely to report that differentiated instruction occurs in their schools. These are important findings because, as Wahlstrom and Louis (2008) pointed out, research regarding the effects of principal practices on instruction is limited. Our results suggest that leadership is vital to the instructional climate of schools. Implementing differentiated instruction is challenging and requires a great deal of time and skill to put into practice and maintain (e.g., McAdamis, 2001; Page, 2000; Pettig, 2000; Tomlinson & Allan, 2000; Tomlinson et al., 2003; VanTassel-Baska et al., 2008). Therefore, as our findings indicate, principals' instructional support might be an important component of school norms for teachers to use differentiated instruction. Future research should explore these connections, perhaps with more items to construct the measures. Another consideration for future research is to measure teachers' use of differentiated instruction directly either through observations or survey items that ask teachers to report the extent to which they personally differentiate instruction in their classrooms.

While we could have measured any number of instructional approaches, we chose to examine differentiated instruction for a variety of reasons. Among these, differentiated instruction shows promise as having a positive impact on student achievement (Goddard & Goddard, 2007; Simpkins et al., 2009; Sternberg et al., 1998; Tieso, 2005). This is important because we wanted to focus on an instructional strategy with research support that also addressed meeting the diverse needs of students. In addition, while effective curriculum is an important factor affecting instruction, teachers can differentiate in ways that complement a variety of curricula (e.g., Gray & Waggoner, 2002; Hoover & Patton, 2004; Simpkins et al., 2009; Tieso, 2005). Finally, previous researchers have found that systemic change may be required to implement differentiated instruction, thus making it a major reform challenge (Pettig, 2000; Tomlinson & Allan, 2000). The fact that our hypothesis was confirmed indicates that principals' support may play a major role in reforms fostering deviation from typical teaching practices and meeting the needs of diverse students.

Appendix A
Conceptual and Empirical Linkages from the Literature to Our Survey Items

The literatures related to our measures are expansive. Therefore, we included this appendix to provide direct connections between these literatures and the items we used to design our measures.

Principals' Instructional Support

The Principal Helps with Instructional Practices

An essential component of instructional leadership is the principal's involvement with the technical core of the school, that is, teaching and learning (Banburg & Andrews, 1990; Hallinger, 1992, 2005; Hallinger & Murphy, 1986; Heck et al., 1990; Marks & Printy, 2003). This may include managing the instructional program (Banburg & Andrews, 1990; Hallinger, 1992, 2003, 2005; Tyack & Hansot, 1982), engaging teachers in discussions

around instruction, and monitoring teaching and learning in the school (Hallinger, 2005).

Teachers Are Comfortable Discussing Instructional Issues with the Principal

As an instructional leader, principals must promote the type of positive learning climate that supports continuous instructional improvement (Hallinger, 2005), allowing teachers to feel comfortable approaching them about instructional issues. This is also a component of transformational leadership, in which the principal not only provides individual support (Bass & Avolio, 1994; Leithwood & Jantzi, 1999), but also builds a collaborative culture throughout the school (Hallinger, 1992, 2005). The principal must actively listen to teachers, providing assistance and help as needed (Antonakis et al., 2003; Bass & Riggio, 2006; Marks & Printy, 2003).

The Principal Empowers Teacher Decision Making about Teaching and Learning

As a transformational leader, the principal is called upon to create structures that enable teacher participation in decision making (Bass & Avolio, 1994; Leithwood & Jantzi, 1999), as opposed to making decisions in isolation. This allows teachers to develop their own capacity to improve their work (Hallinger, 1992; Marks & Printy, 2003) in ways that enhance the school's ability to overcome obstacles that could not be solved by the principal alone (Robinson et al., 2008), such as instructional challenges.

Differentiated Instruction

Offering a Range of Assignments to Address Students' Needs and Skills

Student diversity is the impetus for differentiating instruction. The premise is that teachers must meet their students' needs and thus cannot instruct the same way for all students (Hoover & Patton, 2004; Tomlinson & Allan, 2000; VanTassel-Baska et al., 2008). Offering a range of assignments matched to students' needs and skill levels is an inherent aspect of differentiated instruction (Tomlinson et al., 2003). Vygotsky's (1978, 1986) work specific to students' zone of proximal development is foundational to meeting students' unique needs and skill levels and is thus instrumental to differentiated instruction. Other research (e.g., Bransford et al., 1999; Tomlinson et al., 2003) supports the importance of teachers addressing their students' needs and skill levels when designing instruction.

Recognizing all Students' Progress

To effectively differentiate instruction, teachers must be aware of how their students are progressing. Without progress monitoring, teachers will not understand students' ongoing and changing needs (Bransford et al., 1999; Sternberg et al., 1998) and will be less likely to truly differentiate (Tomlinson et al., 2003).

Providing Different Activities So That Students Have Choice

Allowing choice provides opportunities for teachers to differentiate instruction based on student interest (Tomlinson et al., 2003). Getting students interested in schoolwork

and promoting choice among activities is likely to result in students being more engaged and excited about learning (Simpkins et al., 2009; Sternberg et al., 1998; Tomlinson et al., 2003).

References

Antonakis, J., Avolio, B. J., & Sivasubramania, N. (2003). Context and leadership: An examination of the nine-factor full-range leadership theory using the multifactor leadership questionnaire. *Leadership Quarterly,* **14**, 261–295.

Armor, D., Conroy-Oseguera, P., Cox, M., King, N., McDonnell, L., Pascal, A., . . . Zellman, G. (1976). *Analysis of the school preferred reading programs in selected Los Angeles minority schools* (Report No. R-2007-LAUSD). Santa Monica, CA: RAND. (ERIC Document Reproduction Service No. ED 130 243)

Avolio, B. J. (1994). The alliance of total quality and the full range of leadership. In B. M. Bass & B. J. Avolio (Eds.), *Improving organizational effectiveness through transformational leadership.* Thousand Oaks, CA: Sage.

Avolio, B. J., Bass, B. M., & Jung, D. I. (1999). Reexamining the components of transformational and transactional leadership using the multifactor leadership questionnaire. *Journal of Occupational and Organizational Psychology,* **72**, 441–462.

Banburg, J. D., & Andrews, R. L. (1990). *Instructional leadership, school goals, and student achievement: Exploring the relationship between means and ends.* Boston: American Educational Research Association.

Bass, B. M., & Avolio, B. J. (1994). Introduction. In B. M. Bass & B. J. Avolio (Eds.), *Improving organizational effectiveness through transformational leadership* (pp. 1–10). Thousand Oaks, CA: Sage.

Bass, B. M., Avolio, B. J., Jung, D. I., & Berson, Y. (2003). Predicting unit performance by assessing transformational and transactional leadership. *Journal of Applied Psychology,* **88**(2), 207–218.

Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership.* Mahwah, NJ: Erlbaum.

Berman, P., McLaughlin, M., Bass, G., Pauly, E., & Zellman, G. (1977). *Federal programs supporting educational change: Vol. 7. Factors affecting implementation and continuation* (Report No. R-1589/7-HEW). Santa Monica, CA: RAND. (ERIC Document Reproduction Service No. 140 432)

Bossert, S. T., Dwyer, D. C., Rowan, B., & Lee, G. V. (1982). The instructional management role of the principal. *Educational Administration Quarterly,* **18**(3), 34–64.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (1999). *How people learn: Brain, mind, experience, and school.* Washington, DC: National Academy Press.

Brookover, W. B., & Lezotte, L. W. (1979). *Changes in school characteristics coincident with changes in student achievement.* East Lansing Institute for Research on Teaching, Michigan State University. (ERIC Document Reproduction Service No. ED 181005)

Burns, J. M. (1978). *Leadership.* New York: Harper & Row.

Carolan, J., & Guinn, A. (2007). Differentiation: Lessons from master teachers. *Educational Leadership,* **64**(5), 44–47.

Coleman, J. S. (1990). *Foundations of social theory.* Cambridge, MA: Harvard University Press.

Edmonds, R. (1979). Effective schools for the urban poor. *Educational Leadership,* **37**, 16–23.

Edmonds, R. R., & Frederiksen, J. R. (1978). *Search for effective schools: The identification and analysis of city schools that are instructionally effective for poor children.* Cambridge, MA: Center for Urban Studies.

Elmore, R. F. (2000). *Building a new structure for school leadership.* Washington, DC: Albert Shanker Institute.

Goddard, R. D. (2002). Collective efficacy and school organization: A multilevel analysis of teacher influence in schools. *Theory and Research in Educational Administration,* **1**, 169–184.

Goddard, R. D., Sweetland, S., & Hoy, W. K. (2000). Academic emphasis of urban elementary schools and student achievement in reading and mathematics: A multilevel analysis. *Educational Administration Quarterly,* **36**(5), 683–702.

Goddard, Y. L., & Goddard, R. G. (2007, November). *A statewide study of the effects of differentiated instruction on fourth grade students' mathematics and reading achievement.* Paper presented at the University Council for Educational Administration annual conference, Washington, DC.

Gray, K. C., & Waggoner, J. E. (2002). Multiple intelligences meets Bloom's taxonomy. *Kappa Delta Pi Record,* **38**(4), 184–187.

Hallinger, P. (1992). School leadership development: Evaluating a decade of reform. *Education and Urban Society,* **24**(3), 300–316.

Hallinger, P. (2003). Leading educational change: Reflections on the practice of instructional and transformational leadership. *Cambridge Journal of Education,* **33**(3), 329–351.

Hallinger, P. (2005). Instructional leadership and the school principal: A passing fancy that refuses to fade away. *Leadership and Policy in Schools,* **4**, 221–239.

Hallinger, P., & Murphy, J. F. (1986). The social context of effective schools. *American Journal of Education,* **94**, 328–355.

Heck, R. H., Larsen, T. J., & Marcoulides, G. A. (1990). Instructional leadership and school achievement: Validation of a causal model. *Educational Administration Quarterly,* **26**(2), 94–125.

Hertberg-Davis, H. L., & Brighton, C. M. (2006). Support and sabotage: Principals' influence on middle school teachers' responses to differentiation. *Journal of Secondary Gifted Education,* **17**(2), 90–102.

Hoover, J. J., & Patton, J. R. (2004). Differentiating standards-based education for students with diverse needs. *Remedial and Special Education,* **25**(2), 74–78.

Hoy, W. K., & Miskel, C. G. (2005). *Educational administration: Theory, research, and practice* (7th ed.). Boston: McGraw Hill.

Leithwood, K. (1994). Leadership for school restructuring. *Educational Administration Quarterly,* **30**(4), 498–518.

Leithwood, K., & Jantzi, D. (1999). The relative effects of principal and teacher sources of leadership on student engagement with school. *Educational Administration Quarterly,* **35**(5), 679–706.

Leithwood, K., & Jantzi, D. (2005). A review of transformational leadership research 1996–2005. *Leadership and Policy in Schools,* **4**(3), 177–200.

Lezotte, L. W. (2001). *Revolutionary and evolutionary: The effective schools movement.* Okemos, MI: Effective Schools Products.

Marks, H. M., & Printy, S. M. (2003). Principal leadership and school performance: An integration of transformational and instructional leadership. *Educational Administration Quarterly,* **39**(3), 370–397.

McAdamis, S. (2001). Individual paths. *Journal of Staff Development,* **22**(2), 48–50.

Mortimore, P. (1993). School effectiveness and the management of effective learning and teaching. *School Effectiveness and School Improvement,* **4**, 290–310.

Page, S. W. (2000). When changes for the gifted spur differentiation for all. *Educational Leadership,* **58**(1), 62–65.

Pettig, K. L. (2000). On the road to differentiated practice. *Educational Leadership,* **58**(1), 14–18.

Printy, S., Marks, H. M., & Bowers, A. J. (2009). Integrated leadership: How principals and teachers share instructional influence. *Journal of School Leadership,* **19**(5), 504–532.

Purkey, S., & Smith, M. (1983). Effective schools: A review. *Elementary School Journal,* **83**, 426–452.

Quinn, D. M. (2002). The impact of principal leadership behaviors on instructional practice and student engagement. *Journal of Educational Administration,* **40**, 447–468.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.

Raudenbush, S. W., Rowan, B., & Cheong, Y. F. (1992). Contextual effects on the self-perceived efficacy of high school teachers. *Sociology of Education,* **65**, 150–167.

Robinson, V. M. J., Lloyd, C. A., & Rowe, K. J. (2008). The impact of leadership on student outcomes: An analysis of the differential effects of leadership types. *Educational Administration Quarterly,* **44**(5), 635–674.

Rosenholtz, S. J. (1985). Effective schools: Interpreting the evidence. *American Journal of Education,* **9**, 352–388.

Simpkins, P. M., Mastropieri, M. A., & Scruggs, T. E. (2009). Differentiated curriculum enhancements in inclusive fifth-grade science classes. *Remedial and Special Education,* **30**, 300–308.

Sternberg, R. J., Torff, B., & Grigorenko, E. L. (1998). Teaching triarchically improves school achievement. *Journal of Educational Psychology,* **90**, 374–384.

Supovitz, J., Sirinides, P., & May, H. (2010). How principals and peers influence teaching and learning. *Educational Administration Quarterly,* **46**(1), 31–56.

Tieso, C. (2005). The effects of grouping practices and curricular adjustments on achievement. *Journal for the Education of the Gifted,* **29**(1), 60–69.

Tomlinson, C. A. (2004). The Mobius effect: Addressing learner variance in schools. *Journal of Learning Disabilities,* **37**, 516–524.

Tomlinson, C. A., & Allan, S. D. (2000). *Leadership for differentiating schools and classrooms.* Alexandria, VA: Association for Supervision and Curriculum Development.

Tomlinson, C. A., Brighton, C., Hertberg, H., Callahan, C. M., Moon, T. R., Brimijoin, K., . . . Reynolds, T. (2003). Differentiating instruction in response to student readiness, interest, and learning profile in academically diverse classrooms: A review of literature. *Journal for the Education of the Gifted,* **27**, 119–145.

Tyack, D., & Hansot, E. (1982). *Managers of virtue: Public school leadership in America, 1820–1980.* New York: Basic Books.

VanTassel-Baska, J., Feng, A. X., Brown, E., Bracken, B., Stambaugh, T., French, H., . . . Bai, W. (2008). A study of differentiated instructional change over three years. *Gifted Child Quarterly,* **52**, 297–312.

Vygotsky, L. (1978). *Mind in society.* Cambridge, MA: Harvard University Press.

Vygotsky, L. (1986). *Thought and language.* Cambridge, MA: MIT Press.

Wahlstrom, K. L., & Louis, K. S. (2008). How teachers experience principal leadership: The roles of professional community, trust, efficacy, and shared responsibility. *Educational Administration Quarterly,* **44**(4), 458–495.

Westberg, K. L., & Archambault, F. X., Jr. (1997). A multi-site case study of successful classroom practices for high ability students. *Gifted Child Quarterly,* **41**(1), 42–51.