TO WHAT EXTENT DO TYPOLOGIES OF SCHOOL LEADERS

ACROSS THE U.S. PREDICT TEACHER ATTRITION?

A MULTILEVEL LATENT CLASS ANALYSIS OF

PRINCIPALS AND TEACHERS

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DEDICATION

Foremost, I dedicate this dissertation to my family for their unlimited support. I first learned the importance and power of education from my mom, Ellen, and dad, Phil. Throughout my journey in school, my parents and now my husband, Demetrik, have scarificed their own goals to support me. This dissertation is a reflection of their hardwork. Professionally, this dissertation is dedicated to Andres Castillo. His leadership inspired this study and his mentorship encouraged me to pursue this degree.

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The University of Texas at San Antonio, 2012

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Schools with high teacher turnover struggle to build capacity and increase student achievement. Leadership styles, such as shared instructional leadership found to have the largest effect on student achievement, may also help retain teachers. A long history of research has examined idealized, or effective, leadership styles and their relationship with attitudinal teacher retention variables, teacher satisfaction, commitment, intent to leave. Little is known about the ways in which leaders actually differ across the U.S. and their association with the actual event of teachers staying, moving schools, or leaving the profession. Using a nationally representative sample of teachers in U.S. schools from the 1999-2000 Schools and Staffing Survey (SASS), three sequential latent class analysis models are tested to better understand a) the types of teachers and principals in school leadership while controlling for context, b) the congruency among the perceptions of these types of teachers and principals, and c) the extent that these types help predict teacher attrition. The results of this study show that there are three different types of principals, *Integrating*, *Controlling* and *Balkanizing*, and four different types of teachers, *Integrated*, *Transitioned*, *Balkanized* and *Limited*, based on their perceptions of the principal and teacher leadership within their school. These principal and teacher types are predictors of teacher attrition. *Integrated* teachers were less likely to leave schools with *Integrating* principals.

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CHAPTER ONE: INTRODUCTION

Problem Statement

Schools in the US with higher rates of teacher attrition tend to have lower student achievement (Boyd *et al.*, 2005). Within these schools, principals who experience this staff instability have greater difficulty building a capacity among teachers around instruction. Overall, high rates of teacher attrition are detrimental to the school environment. Guin (2004) found that schools with high teacher turnover have a below average school climate. Teachers reported frustrations with sharing the responsibilities of new teachers, a disruption in professional development and a stagnant instructional program (Guin, 2004). This description of these challenges in high teacher turnover schools links to conceptualizations of school capacity, which if positive, can help increase student achievement (Bryk & Schneider, 2002). In Guin (2004), high teacher turnover schools over a seven-year period had a decline in the number of students who were meeting standards on achievement tests. The frequent loss of teachers contributes to a decline in school effectiveness.

School leaders may mediate these negative effects of teacher attrition. The same malleable factors found to influence a teacher's decision to stay in a school also reflect leadership behaviors that contribute to an increase student achievement. Teacher autonomy, participative decision-making, principal support, teacher recognition, a common vision, professional development and a strong teacher community influence teachers' job satisfaction (Bogler, 2001). Within educational leadership and teacher retention literature, a corpus of studies has examined the influence of work conditions or school leadership on teacher satisfaction, commitment and intent to leave. Few studies have tested the relationship between different leadership styles and the actual event of teachers leaving, moving or staying in schools. Shared

instructional leadership, which is defined by these same leadership behaviors found significant in teacher retention frameworks, also has the largest effect on student outcomes compared to all other leadership styles (Robinson, Lloyd & Rowe, 2008). Seemingly, the practice of shared instructional leadership might help resolve issues surrounding high teacher turnover.

Three main conceptual oversights have prevented a full understanding of the ways in which shared instructional leadership has been developed in schools. First, shared instructional leadership may have the largest influence on student outcomes because it is a collective, or multidimensional, representation of a long history of theoretically distinct effective leadership styles, such as transformational, instructional and distributed leadership (Hallinger, 2003; Marks & Printy, 2003). Although we have these descriptions of effective, "idealized," leadership styles, we have yet to test for the different types of leaders that actually exist across US schools. Principals may enact different leadership behaviors from multiple leadership styles to meet school needs. More specifically, Marks and Printy (2003) concluded that high transformational leadership was necessary for high shared instructional leadership. This combined leadership style, named *integrated*, had the largest impact on student achievement and teacher quality (Marks & Printy, 2003). However, leadership behaviors that are effective for one school may not be effective for another school (Rowan, 1990). There is little evidence to support how principals significantly differ and a great deal of conceptual overlap among leadership styles.

Second, no study has used national level data to provide a description of the different ways in which principal and teacher perceptions of leadership interact within a school to demonstrate variations of shared leadership (Spillane *et al.*, 2007). This is partially due to the fact that most research on leadership is limited to teacher perception and aggregates of perception as a school level measure. Few studies have utilized principal perception (Leithwood

& Jantzi, 2008; Urick & Bowers, 2011) and distinguished between the perceptions of each stakeholder as a separate measure representative of a specific role within the school.

Third, the context, such as resources, district/state accountability and demographics, also alters leadership practice (Goldring, *et al.,* 2008; Hallinger, Bickman & Davis, 1996). Principals change their leadership practice in order to meet the needs of their particular context. Yet, it is unclear which school, principal or teacher characteristics most contribute to the ways in which school leadership varies across the U.S. In sum, to date, no study has investigated the different types of principals and teachers in school leadership using nationally representative data of all U.S. school contexts and the extent that these types predict teacher retention.

Thus, the purpose of this study is to examine a) the types of teachers and principals in school leadership while controlling for teacher, school and principal context, b) the congruency among the perceptions of these types of teachers and principals, and c) the extent that these types help predict teacher attrition.

Significance of Study

This study applies an innovative methodological approach, multilevel mixture model, to test the ways in which leadership practice has varied based on the multidimensionality, or overlap, of leadership styles and differences across U.S. school contexts. Conclusions from this analysis extend leadership theory by examining the intersection of shared instructional leadership, contingency leadership and teacher retention theoretical frameworks. With the inclusion of these corresponding theories in an empirical test, these results provide educational leaders with a description from which to identify different types of principals and teachers and the degree that they practice shared instructional leadership within a particular context. Furthermore, educational leaders will be able to better understand the extent to which an

identified set of teacher and principal leadership behaviors helps to reduce the number of teachers who will leave a school or education as a profession.

From this purpose of the study, several specific contributions to theory and practice are gained. This study adds to theory by a) distinguishing the difference between types of teachers and principals who practice leadership in comparison to existing theoretically defined leadership styles, b) modeling the extent to which teacher and principal perceptions of leadership interact in context, and c) clarifying the ways in which variations of leadership practice across the U.S. help predict teacher retention. Educational leaders will be able to use these findings to guide their practice of leadership within a particular context by a) implementing behaviors from both teachers and principals that help to reduce the number of teachers leaving the school and profession, b) initiating the degree of centralized or decentralized leadership for organizational change, and c) aligning fit between teacher and principal perceptions of the ways in which leadership is practiced.

The results of this study provide novel extensions of leadership and teacher retention theory as well as useful implications for practice and policy. For theory, this study established *integrated* teachers with *integrating* principals as predictors of teacher retention. Further, these findings demonstrate evidence to support a shift in the way that researchers frame and analyze leadership. First, our notions of idealized leadership have often been limited to a particular leadership style, yet this study shows that styles are simultaneously practiced and practice varies by context. Second, a person centered rather than variable centered approach to the study of school leadership better identifies differences in the ways in which leadership is practiced across contexts. For practice, this study provides further evidence to school leaders, faculty in principal preparation programs and policymakers about the ways in which leadership influences teacher

retention. These findings suggest that school leaders should become more aware of the ways in which the teachers in their school experience their leadership. Principals should focus on building stronger relationships with teachers who might perceive their leadership as less frequent regardless of the degree of teacher autonomy provided to the teacher. The results of this study indicate that there is a need to further address the discrepancies between principal and teacher perceptions within principal preparation programs so that principals are trained how to fit leadership behaviors to teacher expectations or needs. Finally, these results provide evidence to policymakers that principals contribute to the management of teacher turnover.

Guiding Questions

These contributions and the above issues are addressed with the following guiding questions:

1. What types of principals and teachers exist in school leadership across the U.S.?
2. To what extent do these different types of teachers and principals in school leadership predict teacher retention?

Overview of Study Procedures

This study uses a nationally representative sample of public school principals (n=7,310) and teachers (n=35,560) from the 1999-2000 Schools and Staffing Survey (SASS) and former teachers (n=1,410) from the 2000-2001 Teacher Follow up Survey (TFS) (Gruber *et al.*, 2002; NCES, n.d.). Originally collected by the National Center for Education Statistics (NCES), SASS includes items that measure the work conditions in schools from teacher and principal perceptions and provides school, principal and teacher characteristics (Gruber *et al.*, 2002). These work condition items align with descriptions of transactional, transformational,

instructional and shared instructional leadership by measuring the frequency of tasks and amount of influence over tasks performed by teachers and principals. In addition, the SASS variable ATTRIT provides an account of whether or not the teachers in the full sample stayed at their school, moved schools or left teaching the following year. The general SASS teacher retention categories of stayers, movers and leavers are used as outcomes in addition to a distinction between necessity leavers (i.e. retirement, disability), position change leavers (i.e. still in schools or the field of education but not as a teacher) and occupation leavers (i.e. no longer working in schools or education) in the Teacher Follow up Survey (TFS).

Following recent calls to model the complex and mediated effects of leadership in schools (Hallinger & Heck, 2011), this data is analyzed using a two-level latent class analysis (LCA), or multilevel mixture model (see Asparouhov & Muthén, 2008), in Mplus version 6. Latent class analysis (LCA) identifies significantly different subgroups, or types, within populations with a k-1 hypothesis test of the number of types of principals (level 2 of LCA) and teachers (level 1 of LCA) based on the similarities and differences in their perceptions of how multiple leadership styles are practiced within their school. Since previous literature provides little evidence of the different types of teachers and principals that exists in school leadership across the U.S., two separate single level latent class analyses, one for teachers and one for principals, are analyzed to better understand the typologies of principals and teachers. Finally, both teacher and principal perceptions are included in an omnibus multilevel latent class analysis.

The final two-level omnibus model simultaneously defines the types of teachers and principals with a more accurate representation of the two-way relationship between teachers and principals in school leadership. The types of principals are regressed on the types of teachers in

order to analyze the extent that teacher types group within principal types. This test of the relationship between principal types and teacher types, and the interaction between teacher and principal perception of leadership survey items included as random variables, demonstrates the extent of the interaction, or two-way relationship. These random items, or the cross-level interaction, allow teacher perception to vary by their principal's perception, which accounts for the dependent nature of the relationship between principal and teachers within the school environment.

Latent class analysis, the identification of subgroups based on a participant's responses to a set of survey items, sits within a mediated or structural equation model framework to simultaneously account for control variables when identifying the different subgroups, or types (Muthén, 2002; 2003; 2004; 2008). This structural equation modeling structure of mixture models allows for the inclusion of context variables to appropriately account for the influence of school, principal and teacher characteristics when testing for the statistical difference between types of teachers and principals. As a distal outcome outside of the omnibus model, the selected categories of teacher retention are used to test the difference between the numbers of teachers who stay, move or leave for each identified leadership practice.

Summary of Results

The results of this study showed that there were three different types of principals, *Integrating, Controlling,* and *Balkanizing* and four different types of teachers, *Integrated, Transitioned, Balkanized* and *Limited*. The responses of the different teacher and principal types seemed to have some congruency, which is reflected with the mirroring of the type names (e.g. *Transitioned* teachers, *Transitioning* principals). Yet, the high responding teachers, *Integrated* and low responding teachers, *Limited* were evenly distributed across principal types. This shows

that no matter which principal type leads the school, there are teachers within that school who view the principal and teacher leadership as either high or low. This suggests that teachers may conflate their experience with school leadership with their satisfaction or fit with the principal. The variance in the perceptions of leadership is greater within schools compared to between schools. However, *Integrated* teachers with *Integrating* principals were less likely to leave their current school. Principals who see themselves as practicing integrated leadership, as defined by Marks and Printy (2003), are less likely to lose teachers who also view this principal as practicing integrated leadership. In contrast, *Limited* and *Balkanized* teachers more often left their school or the profession regardless of the principal type. These findings suggest that principals can direct the retention and turnover of teachers.

Definition of Terms

Types, classes, groups, subgroups, subpopulations, typology– synonymous terms for the results of the latent class analysis

Types versus styles – A type denotes a group of participants who respond or behave in a similar way, person-centered. A style is a composite of related behaviors used to describe leadership, variable-centered. In this study, the differences between the types, or groups of respondents, are described by their perception or experience of multiple styles.

Transactional leadership—a leadership style best defined by managerial tasks and the supervision of staff

Transformational leadership—a leadership style best defined by communication of a mission, building community, professional development

Instructional leadership—a leadership style best defined by coordination of instructional program

Shared instructional leadership—a leadership style best defined by coordination of the instructional program by teachers

Distributed leadership—In this study, it is used as a theory to understand the ways in which leadership is decentralized. In other studies cited in this dissertation, it represents a leadership style similar to shared instructional leadership.

Multidimensional leadership—the overlap or positive relationships between leadership styles

Teacher retention—the event of teachers staying at a school or in the profession

Teacher mobility—the event of teachers moving schools

Teacher attrition, teacher turnover—the event of teachers leaving a school or the profession

Occupation leavers—teachers who no longer work in education as a profession

Position leavers—teachers who no longer teach but still work in schools or education

Necessity leavers—teachers who left teaching to retire, because of a disability, or to take care of an ill family member

This dissertation follows a traditional structure. Chapter two provides an overview of the research to date on leadership and teacher retention, a description of the theoretical framework for this study, and research questions. Chapter three details the methods of this study with an explanation of the sample, variables used in the analysis, analytical models and statistical procedures. Chapter four describes each of the findings from all three of the latent class analysis models. Chapter five outlines the extent to which each result has confirmed, extended or provided future directions for research.

CHAPTER TWO: REVIEW OF LITERATURE

This chapter describes how this study is situated within the current literature on teacher retention and school leadership. The discussion of previous research is followed by a theoretical framework that outlines how prior findings and theory are used to explain and measure a typology of both principals and teachers in school leadership and their association with teacher retention and attrition. This section concludes with the research questions this study provides evidence to answer.

Review of Literature

Evidence from prior research demonstrates a parallel in the leadership behaviors found to increase teacher retention as well as increase student achievement. Further, an in depth exploration into the ways in which these effective leadership behaviors have been grouped into leadership styles shows that leadership styles do not define difference between leaders. Instead, transactional, transformational, instructional and shared instructional leadership styles share leadership behaviors as descriptors and are positively related. Thus, a leadership style, integrated leadership (Marks & Printy, 2003), which shares the most attributes with other effective leadership styles, would have the largest impact on teacher and student outcomes. Since descriptions of effective leadership styles have limited distinguishing behaviors, researchers have used typology frameworks to study the differences between leaders, or types of leaders from their chosen use of a comprehensive list of behaviors. However, few studies have sought to define different types of leaders using typology frameworks through applications of person-centered statistics, such as cluster analysis or latent class analysis. Finally, an over reliance and inconsistent use of attitudinal proxies for teacher retention, such as intent to leave and

satisfaction, has prevented an understanding of the extent to which variations of school

leadership help predict whether or not a teacher will stay or leave the following year.

Teacher Retention and School Leadership

School leadership has been a significant predictor of whether or not teachers stay at a

school. An increase in teacher autonomy, distributed decision-making, professional

development, principal support and an overall positive social environment have positively

influenced teachers' intentions to stay at a particular school (Dorman, 2003; Loeb, Darling-

Hammond & Luczak, 2005; Hulpia, Devos & Rosseel, 2009; Skaalvik & Skaalvik, 2010;

Somech & Ron, 2007; Zembylas & Papanastasiou, 2005). In fact, Billingsley and Cross (1992)

have argued that these work conditions or school leadership behaviors have outweighed the

impact of teacher demographics, such as race, gender, education and experience, on teachers'

decisions to stay in teaching and at their current schools. Likewise, Loeb, Darling-Hammond and

Luczak (2005) have found that when work conditions increased, the influence of school-level

student characteristics on turnover was reduced. Further, principals have influenced work

conditions with a supportive environment with high expectations, which has been shown to relate

to student behavior, parental involvement, and student achievement (Griffith, 1999; MacNeil, *et

al.*, 2009; Urick & Bowers, 2011). Teacher background, school demographics, social disorder,

low academic achievement, heavy workloads and poor compensation have contributed to higher

rates of teacher turnover.

Three main factors have been shown to have the greatest impact on teacher retention

decisions: salary/workload, strong teacher community, and positive school climate. From a

quality of life perspective (Cenkseven-Onder & Sari, 2009), these main factors have mirrored the

hierarchical needs for well-being (Maslow,1954). First, teacher salary and workload have been

associated with burnout, engagement, commitment, and attrition (Hakanen, Bakker & Schaufeli, 2006; Hanushek, Kain & Rivikin, 2004; Loeb, Darling-Hammond & Luczak, 2005). While salary and workload have obvious negative effects, Loeb and associates (2005) have suggested that they can also have a positive impact and mediate the influence of demographics on retention.

Second, teachers have left schools that do not match their own characteristics. O'Reilly, Chatman and Caldwell (1991) have explained that the self-concept, values, expectations, norms, attitudes and behaviors should be similar between person and organization in order to have a good fit. Teachers have left poor schools, pre-dominately non-White schools, and schools with apathetic teachers (Hancock & Scherff, 2010; Ingersoll & May, 2010; Renzulli *et al.*, 2011; Shen, 1997; Sohn, 2009). Further, the extent to which teachers have experienced a professional community has also been reliant on these similarities, or fit, in their relationships with principals (Rinehart, Short, Short & Eckley, 1998) and teachers (Smith & Ingersoll, 2004).

Third, student misbehavior has predicted teacher retention outcomes (Ingersoll & May, 2010). Schools with poor behavior climate have increase teacher turnover (Grayson & Alvarez, 2008; Hastings & Bham, 2003; Kelly, 2004; Kukla-Acevedo, 2009). However, poor student behavior is an indicator of a more broad issue within the school. Evers *et al.* (2004) found that a teacher competence to cope with student misbehavior predicted burnout, which leads to teacher attrition. At the same time, administrator support has mediated the impact of this social variable on retention outcomes (Tickle, Chang & Kim, 2011). Although a teacher may lack experience with misbehavior, through leadership behaviors a principal can offer teacher support and directly impact the social climate of the school. Effective principal leadership can mediate the influence of most contextual characteristics, such as demographics or teacher salary, on teacher retention

outcomes (Billingsley & Cross, 1992). These findings are further confirmed in school leadership literature.

Work conditions preferred by teachers in the teacher retention literature have mirrored effective leadership in school leadership literature. Teachers who are empowered by effective leadership practices have been found to be more committed and satisfied with their teaching positions (Somech, 2005). In a recent meta-analysis, Robinson, Lloyd and Rowe (2008) found a set of consistently significant effective leadership behaviors that have influenced school performance: establishing goals and expectations, strategic resourcing, coordinating/evaluating teaching and curriculum, promoting/participating in teacher learning and development, and ensuring an orderly and supportive social environment. Principals who use these leadership behaviors to support and empower teachers to participate in school decisions through shared leadership have increased school performance (Heck & Hallinger, 2009) and positively influenced teachers' decisions to stay (Hulpia, Devos & Van Keer, 2010). Yet, although these leadership behaviors have been consistently significant throughout the literature, a limited number of studies have accounted for how leadership, especially teacher and principal perceptions of leadership, has varied across schools. Descriptions of leadership styles offer the best description to date of this core set of leadership behaviors and, in turn, possible ways in which leaders may differ.

Leadership Styles

Transformational leadership. Burns (1978) first conceptualized transformational leadership as a leader's ability to a) increase member consciousness about the value and process of reaching goals, b) influence members to value team over self, and c) transform members' needs beyond simple survival to personal development and achievement. Burns (1978) originally

postulated that transformational leaders served a moral purpose through these actions, which constituted a non-coercive power.

Bass (1985) confirmed that transformational and transactional leadership, or managerial tasks, were not simply on opposite ends of a continuum. Transactional leaders have been described as leaders who are highly task-oriented, mainly taking control of managerial tasks, and offer rewards or punishment contingent on goal outcomes (Bass, 1985a, 2008). With follower descriptions of military and civilian leaders, Bass (1985a) verified that the relationship between transactional and transformational leadership was multidimensional. He concluded that since the two styles of leadership were positively correlated that transformational leadership further increased transactional leadership effects. From this study, Bass (1985a) and associates (Avolio, Bass & Jung, 1999; Bass & Avolio, 1990; Hater & Bass, 1988) began to develop the Multifactor Leadership Questionnaire (MLQ), which evolved to include measures for laissez-faire (non-leadership), transactional and transformational leadership from the following dimensions: charismatic leadership, intellectual stimulation, individualized stimulation, were measures of transformational leadership, and contingency reward, active management by exception (monitoring of staff and control of managerial tasks, such as resources), passive management by exception (monitoring of staff only when necessary and control of managerial tasks, such as resources), were measures of transactional leadership.

In a meta-analysis of MLQ literature, Lowe, Kroeck and Sivasubramaniam (1996) found somewhat consistent evidence of the relationship between transformational leadership and organizational effectiveness. However, this relationship between organizational outcomes and transformational leadership was often moderated by context variables, such as organization type or level of leader. For example, the effect of intellectual stimulation on outcomes was

significantly predicted by organization type. Similar to Bass (1985), Lowe and authors (1996) found that contingent reward, an increase in pay, resources or some other work condition, a measure of transactional leadership, was significantly related to most organizational outcomes.

The enactment of transformational leadership has positively influenced outcome in schools. Leithwood (1994) has described transformational leadership for school administration with eight dimensions: building a school vision, establishing school goals, providing intellectual stimulation, offering individualized support, modeling best practices and values, communicating high expectations, creating a positive school culture, and promoting participation in school decisions. Measures of transformational leadership have been found to positively influence school outcomes and student learning (Robinson *et al.*, 2008; Marks & Printy, 2003). More specifically, transformational school leaders have increased teacher job satisfaction (Bogler, 2001; Korkmaz, 2007; Nguni, Sleegers, & Denessen, 2006). Aspects of transformational leadership have increased a positive school climate (Moolenaar, Daly & Sleegers, 2010) and teacher community or professional collegiality (Weathers, 2011). Like studies outside of education, Nguni *et al.* (2007) concluded that transformational leadership added to the influence of transactional leadership through contingent rewards and active management by exception, which demonstrates that more effective leaders enact leadership behaviors from multiple leadership styles (*see figure 1*).
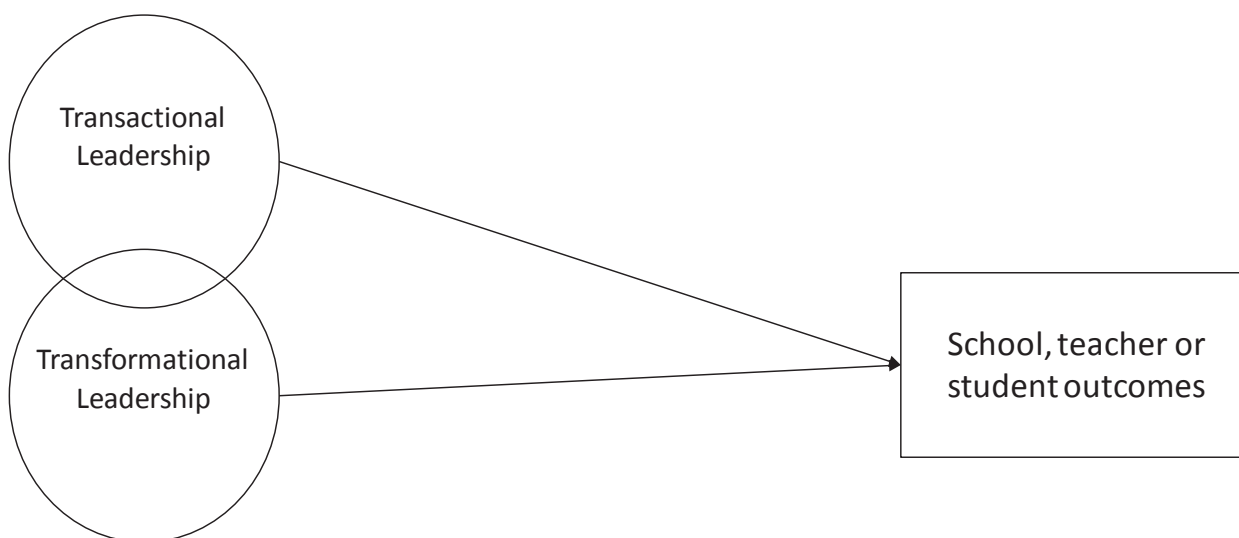
Figure 1. Transactional and transformational leadership are positively correlated. Both transactional leadership, management tasks, such as distribution of resources or monitoring of goals, and transformational leadership, the development of a common mission, professional development, a positive climate and inclusion of teachers in decisions through this climate and a strong teacher community, can influence school, teacher and in some cases student outcomes.

Prior to the surge of transformational leadership from mainstream business literature into educational research, a more directive style of instructional leadership (e.g. Leithwood & Montgomery, 1982) was considered a resource for school effectiveness. The eventual merger of transformational and instructional leadership concepts has further increased leadership effectiveness in schools (e.g. Marks & Printy, 2003).

Instructional leadership. In the late 1970's to early 1980's, Edmonds (1979) and Leithwood and Montgomery (1982) identified successful principals of urban schools with a high percentage of low socioeconomic students as directive leaders who had a strong focus on curriculum and instruction. Instructional leaders planned, coordinated, supervised and developed

the curriculum and instruction (Bamburg & Andrews, 1990) with both charisma and expertise (Hallinger & Murphy, 1986). Hallinger (2000) has identified three dimensions of instructional leadership: defining school goals and mission, coordinating the instructional program and promoting a positive academic climate. More specifically, researchers have exemplified the significance of professional development and growth (Blase & Blase, 1999; Grodsky & Gramoran, 2003), teacher community (Grodsky & Gamoran, 2003; Wahlstrom & Louis, 2008;Weathers, 2011) as well as reflective practices (Barnett *et al.*, 2004; Blase & Blase, 1999) for effective instructional leadership. This description of instructional leadership mirrors many of the behaviors associated with transformational leadership, such as building a mission and a positive academic climate (Bossert, Dwyer, Rowan & Lee, 1982). However, instructional leadership has a clear focus on the principal's coordination of the instructional program (Bossert *et* al., 1982; Hallinger, 2003).

Early critics of instructional leadership (e.g. Miskel, 1982) contended that too much emphasis was placed on the role of the principal. In some circumstances, the principal has remained the center of conceptual models that illustrate the indirect and direct influence of instructional leadership on students. The principal has continued to be viewed as the forefront of instruction through more directive, strategic leadership in combination with the coordination of curriculum and instruction (Hallinger, Bickman & Davis, 1996; Kruger, Witziers & Sleegers, 2007; Supovitz, Sirinides & May, 2010). Although early instructional leadership has been critiqued as too centralized and overlaps descriptions of transformational leadership, forms of instructional leadership have the largest effect on student outcomes (see *figure 2*).
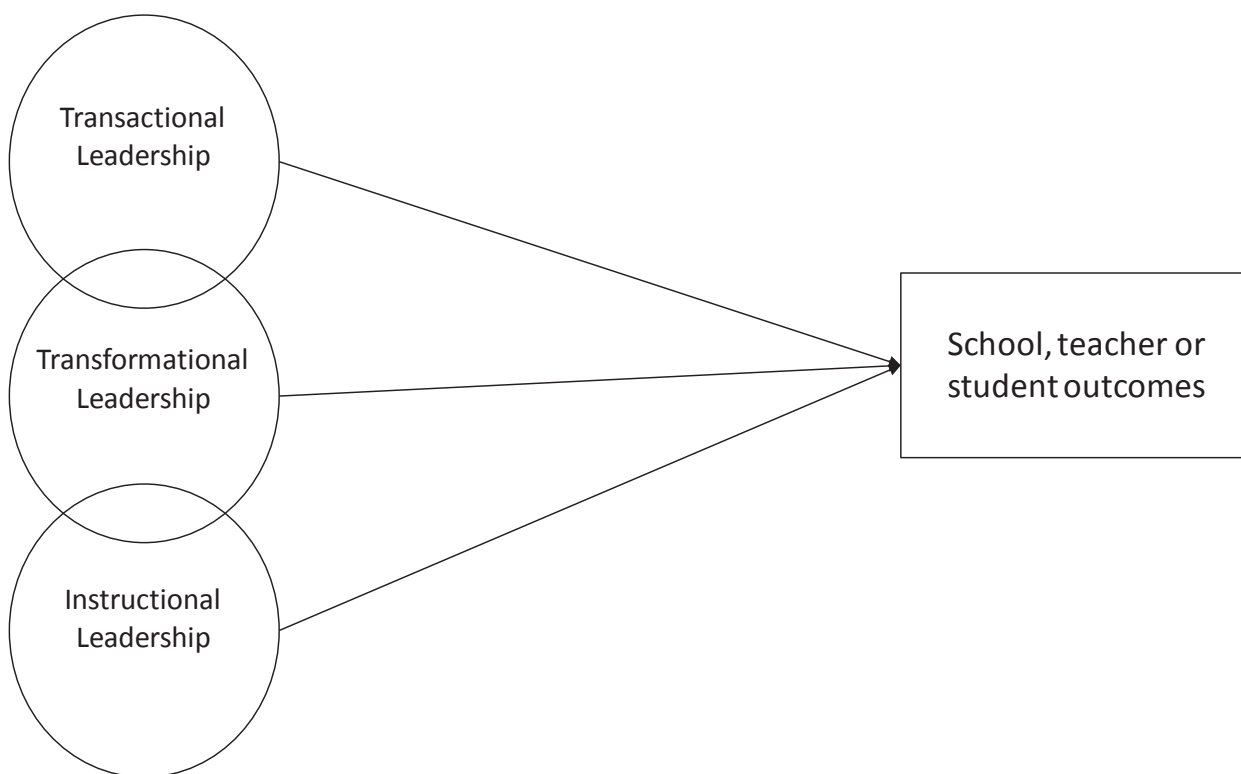
Figure 2. In addition to transactional and transformational leadership, instructional leadership can influence school, teacher and student outcomes. The description of instructional leadership overlaps with descriptions of transformational leadership, but instructional leadership has a clear focus on the principal's direction of the instructional program within the school.

Through the study of teacher leaders and teacher practice, researchers have argued that school outcomes increase when classroom autonomy and school decisions are shared with teachers (Desimone, Smith & Phillips, 2007; Marks & Nance, 2007; Printy, 2008). In fact, Mangin (2007) and Printy (2008) have proposed that principals may slow the progress of teachers since they are removed from the classroom. Whether instructional leadership is a directive of the principal or shared responsibility with teachers, this style of leadership has produced the largest effects on student outcomes compared to all other styles of leadership (Robinson, Lloyd & Rowe, 2008).

Shared instructional leadership. In order to further increase the influence of instructional leadership on school performance, Marks and Printy (2003) have suggested that transformational leadership should be practiced along with shared instructional leadership as an *integrated* style of leadership. In shared instructional leadership, the principal is not an instructional supervisor, but a facilitator of teacher leadership and development (Marks & Printy, 2003). These authors have concluded that shared instructional leadership has increased the effects of transformational leadership on school outcomes. The criticisms of instructional leadership as a principal-centered practice have renewed a mainstream focus in education on more shared or distributed styles of leadership.

Shared instructional leadership is described as a "synergistic power of leadership shared by individuals through the school organization" (Marks & Printy, 2003, p. 393). This synergy around instruction among principals, teachers and the school community is created through a mixture of leadership behaviors that have been associated with instructional leadership, transformational leadership, and shared instructional leadership. In school effectiveness research, this synergy is measured by factors that support successful teacher practice. For example, principals who build a positive climate for teachers through communication of a mission, shared decisions, supportive professional development, a sense of teacher community and public relations with the broader community, promote an environment in which teachers feel empowered and committed (Bryk *et al.*, 2010; Marks & Louis, 1999; Moolenaar, Daly & Sleegers, 2010; Muijs & Harris, 2003; Printy, 2008; Riehl & Sipple, 1996; Somech & Ron, 2007; Thoonen, Sleegers, Oort, Peetsma & Geijsel, 2011; Wahlstrom & Louis, 2008; Ware & Kitsantas, 2011; Zembylas & Papanastasiou, 2005). This teacher commitment and empowerment generated from effective leadership behaviors has been found to increase performance and

student achievement (Bryk *et al.*, 2010; Ostroff, 1992; Somech, 2005; Zigarelli, 1996). Further, teachers who are empowered and committed within their position are less likely to leave their job (Guarino, Santibanez & Daley, 2006), which builds a stable community of effective teacher leaders (Ingersoll, 2001). When principals gain synergy within the school, capacity is developed through teacher empowerment and the experience of continued success, or reciprocal effects (Hallinger & Heck, 2011; Marks & Louis, 1999; Slater, 2008; Somech, 2005; Thoonen *et al.*, 2011). Shared instructional leadership which shares leadership behaviors in descriptions of transformational leadership and instructional leadership has a direct influence on student and teacher outcomes (*see figure 3*).
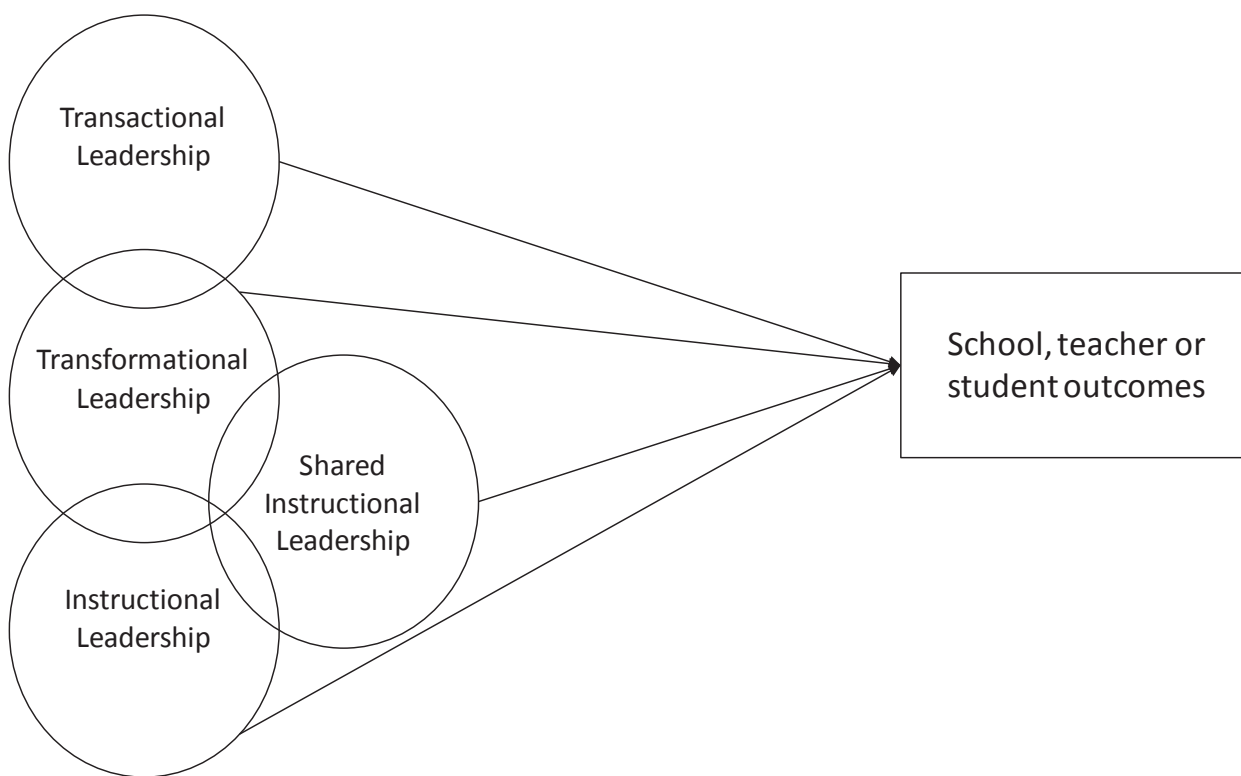
Figure 3. Leadership behaviors which describe transactional, transformational, instructional and shared instructional can influence school, teacher and/or student outcomes. Within previous literature there has been a considerable amount of overlap among the leadership behaviors which describe transformational, instructional and shared instructional leadership styles.

Marks and Printy (2003) concluded that this synergy of shared instructional leadership is derived from what they termed *integrated* leadership. Using a sample of 24 restructured elementary, middle and high schools, they used surveys, interviews and observations to measure the degree of both transformational and shared instructional leadership within each school. To investigate the relationship between transformational and shared instructional leadership, the standardized mean scores of shared instructional leadership were plotted by transformational leadership. By graphing the relationship among both leadership styles at each school, they found that principals who practiced high shared instructional leadership also exhibited high

transformational leadership. Absent from this analysis were principals who were able to practice shared instructional leadership without demonstrating behaviors of transformational leadership, which showed that transformational leadership was necessary but insufficient for shared instructional leadership. The authors assigned the term "integrated leadership" to schools that exhibited both transformational and shared instructional leadership.

To test the effect of integrated leadership on academic outcomes, Marks and Printy (2003) used hierarchical linear modeling to demonstrate the amount of variance explained in pedagogical quality and authentic achievement with integrated leadership. They found that average standardized achievement and integrated leadership explained 26% of the variance in pedagogical quality and student standardized achievement, student ethnicity and integrated leadership explained 57% of the variance in authentic achievement. These findings from Marks and Printy (2003) help to explain the importance of a multi-leadership style approach in order to better understand the ways in which principals develop shared instructional leadership.

Principals, who practice integrated leadership through combining the aspects of transformational and shared instructional leadership, create a synergy among teachers and principals around instruction that supports innovation and change (Marks & Printy, 2003; Moolenaar, Daly & Sleegers, 2010; Printy, Marks & Bowers, 2009; Thoonen, Sleegers, Oort, Peetsma & Geijsel, 2011). Transformational leadership provides particular strategies for building an overall positive climate through a mission, professional growth and a sense of community (s*ee Figure 4*). Similar leadership behaviors have been represented in both instructional (see Hallinger, 2003) and shared instructional leadership (represented by arrows from transformational leadership through shared instructional leadership and mirrored by corresponding grey italics text in figure 4). Instructional leadership takes a more indirect or top-

down approach to building this climate with high visibility of principal and offering of rewards (compare grey italics text in instructional leadership to black text in transformational leadership for build sense of community in figure 4). Yet, instructional leadership adds the coordination of the instructional program not found in transformational leadership (indicated in figure 4 by black text added to the bottom of the instructional leadership column). The same focus on the coordination of the instructional program is transferred to shared instructional leadership (represented in figure 4 by arrow from instructional leadership to shared instructional leadership and corresponding grey italics text). However, shared instructional leadership more accurately represents the original intent of transformational leadership through the inclusion of teachers in the building of community and climate (compare grey italics text in shared instructional leadership to black text in transformational leadership for build sense of community in figure 4). Uniquely, shared instructional leadership contributes that teachers share responsibility for organizational change and leadership around instruction (indicated in figure 4 by black text added to the bottom of the shared instructional leadership column).
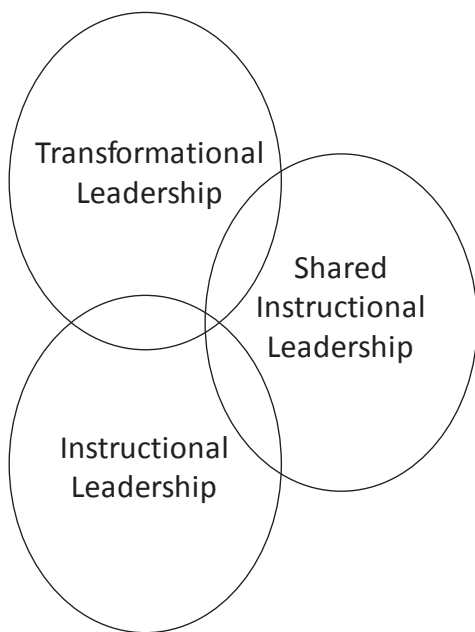
Core Leadership Behaviors	Transformational Leadership (Bass & Avolio, 1994; Bass, 1985; Leithwood, 1994; Leithwood *et al.*, 1999)	Instructional Leadership (Hallinger & Murphy, 1985)	Shared Instructional Leadership (Marks & Printy, 2003; Printy, Marks & Bowers, 2009)
Communicate mission	Inspirational motivation, Idealized influence; common vision and goals, high expectations	*Articulate and communicate clear school goals, high expectations*	*Strong principal leadership to facilitate growth and direction*
Promote professional growth	Individual consideration, intellectual stimulation, offer individualized support	*Promote professional development for teachers*	*Provide opportunities for teacher growth*
Build sense of community	Idealized influence, intellectual stimulation, rewards, foster participation	*Maintain high visibility, provide incentives for teachers, provide incentives for learning*	*Principal and teachers discuss alternatives for instructional practices*
Coordinate the instructional program		Coordinate curriculum, evaluate instruction	*Maintain congruency of educational program*
Share instructional leadership with teachers			Leadership roles for teachers

Figure 4. The table to the right of the depicted overlap among transformational, instructional and shared instructional leadership highlights the descriptions of these leadership styles that are similar (represented by arrows) as well as what each style has uniquely added to our understanding of leadership in schools (black font).

The overlap among these leadership styles and demonstrated independent effects of all styles on school, teacher or student outcomes show that while leadership styles possibly help to describe differences in the effectiveness of principals, they did not provide a clear distinction between the different ways in which leadership is practiced across schools. The overlap of these

descriptions suggests that leadership styles are multidimensional, or related (Bass, 1985a; Hallinger, 2003; Marks & Printy, 2003). The above literature demonstrates that variables used to describe transactional, transformational, instructional and shared instructional leadership have positive relationships or repeat across styles. In practice, this means that a leader can simultaneously exhibit multiple leadership styles and increase their influence on outcomes. The studies of these leadership styles have been focused on examining the extent that a particular style influences an outcome, or is effective. Few studies have attempted to understand how different types of leaders, whether principals or teachers, are distinguished through their own use of these multiple leadership styles. With a shift to more distributed or shared forms of leadership as an effective style, an understanding of the roles of principals and teachers in school leadership has become increasingly important.

Distributed leadership. Forms of shared leadership, or distributed leadership, have extended the study of the ways in which followers have participated in the leadership. Distributed leadership recognizes both informal and formal leaders. Members of the organization are viewed as leaders as well as participators. Gronn (2000) and Spillane, Halverson and Diamond (2001) have defined distributed leadership as the interaction between leaders, followers, and their situation. Spillane (2006) has postulated that distributed leadership changes in accordance with formal and informal leaders involved as well as their situation and school context.

Qualitative research has investigated how distributed leadership has been practiced within schools. Leithwood and associates (2007) inquired from formal and informal leaders at eight schools in one district about district initiatives, leadership roles in initiatives, influences on distributed leadership, the impact of distributed leadership and the relationships between district

and school level leaders. The most salient finding from these data was that formal school and district leaders helped to foster distributed leadership. In these districts, informal leaders were more frequently involved in direction setting, developing people, redesigning the organization and managing the instructional program without the reduction of responsibility of formal leaders. Since informal leaders engaged in leadership activities often, the authors found that the formal leaders had supplied vision, beliefs and plan necessary to distribute this leadership with teachers.

In another study, Firestone and Martinez (2007) described distributed leadership as the way in which leadership is divided among leaders and followers across situations as outlined by Spillane (2006). These authors have focused their study on the influence of district leadership through the study of three districts under a math and science initiative. They proposed that districts and teacher leaders shared responsibility of attainment and distribution of materials, monitoring of progress, and developing people. Firestone and Martinez (2007) attempted to demonstrate the ways in which teacher leaders influenced teaching practice, whereas Leithwood and authors (2007) sought to illustrate how the leadership functions of teachers provided evidence for the extent to which distributed leadership was institutionalized. Although both studies utilized a distributed leadership perspective, the main findings in the study relied on measures of transformational and instructional leadership.

Quantitative studies of distributed leadership have also borrowed leadership behaviors from other types of leadership but variables have been adapted to measure the extent to which informal leaders performed these functions. Heck and Hallinger (2009) predicted the influence of distributed leadership on math achievement growth through school academic capacity. Distributed leadership, measured by collaborative instruction and curriculum decisions, collaborative school decisions, and collaborative evaluation of resources and vision, positively

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influenced capacity (Heck & Hallinger, 2009; Hallinger & Heck, 2010). Although distributed leadership seems to have a positive impact on instruction, the distribution of supervision to teachers has been found to have a negative impact on teacher satisfaction and commitment (Hulpia, Devos & Rosseel, 2009; Hulpia, Devos & Van Keer, 2010). Distribution of support, collegiality between informal and formal leaders, and support from the principal has positively influenced teacher commitment and satisfaction (Hulpia, Devos & Rosseel, 2009; Hulpia, Devos & Van Keer, 2010).

In sum, a principal who promotes and supports the development of teachers into informal leaders can build a positive professional climate among teachers, which influences job satisfaction, organizational commitment and overall academic capacity. Distributed leadership increases follower influence through the sharing of leadership responsibility. In fact, Spillane (2006) has suggests that distributed leadership is merely a perspective from which to examine the interaction of followers, leaders and situations within a school. Subsequently, qualitative findings have described how school and district leadership has been shared with teachers within a particular context. Similar to studies on the effectiveness of other leadership styles, evidence from quantitative studies on distributed leadership has suggested that an increase in the distribution of leadership to teachers has positively influenced school academic capacity, teacher satisfaction and commitment, and indirectly student achievement. Overall, the effectiveness of shared or distributed leadership is ultimately dependent on follower and contextual characteristics. In extension, the significance of this leadership style will most likely vary from organization to organization. Distributed leadership places an importance on the different roles, principal and teacher, within school leadership. The different experiences and perceptions of

both teachers and principals helps to delineate between their roles within shared school leadership, which, to date, has been limited to qualitative studies with limited samples.

Importance of Principal and Teacher Perception

Principal perception and, in turn, principal behavior determine the extent to which school leaders influence organizational change for student improvement. Reviews of the past research on the degree of principal influence on students have shown that principals indirectly affect student learning through teachers (Hallinger & Heck, 1996; Hallinger & Heck, 1998). However, principals who decide to develop and share leadership with teachers build school capacity which positively contributes to academic growth (Heck & Hallinger, 2009; Hallinger & Heck, 2010; Leithwood & Mascall, 2008). Furthermore, this change in school capacity serves as a catalyst for additional reciprocal effects from experiencing academic growth to subsequent advances in shared leadership (Hallinger & Heck, 2011). Principals increase the extent of their influence over school improvement by sharing leadership with teachers.

Although shared instructional leadership operates in a decentralized structure, a principal, in a position of formal authority, guides its development and distributes responsibility to teachers (Anderson, 1991; Leithwood & Jantzi, 1999; Leithwood & Jantzi, 2000; Marks & Louis, 1999, Hallinger & Murphy, 1986). With this guidance, principal leadership directly influences teacher community as well as instruction (Louis *et al.*, 2010; Supovitz, Sirinides & May, 2010). Principals improve teacher practice through supportive managerial tasks, such as hiring, spending, and an orderly climate, but more importantly principals shape instruction through the establishment of a school climate and the frequent communication of a common mission and vision (Firestone & Wilson, 1985, Hallinger & Heck, 2001).

In the recent meta-analysis of the influence of leadership styles on student outcomes by

Robinson, Lloyd & Rowe (2008), out of the 27 studies included the majority of measures

analyzed were limited to teacher perceptions. Aggregates of teacher and staff perception of

leadership are often utilized as a school level measure of leadership. To date, few studies have

investigated leadership styles of principals using principal perception (Leithwood & Jantzi, 2008;

Urick & Bowers, 2011). Leithwood and Jantzi (2008) recommend that "subsequent research

about leader efficacy should attend to the stylistic differences in the enactment of core leadership

practices" (p. 522). Further investigation into principal perceptions of their leadership would

explain the ways in which principals decide to enact leadership behaviors to navigate their

particular context for increased student outcomes through the involvement of teachers in the

leadership of a positive school climate.

To date, no studies have examined how principal perception of leadership may vary by

the different styles of leadership, such as transactional, transformational, instructional and shared

instructional leadership. Although little evidence exists on how the principal perceives their own

leadership as a measure of the ways in which they intend to lead the school, teacher perception is

still important for two reasons. First, in schools where leadership is distributed to teachers,

teacher perception is important to understand the ways in which teachers view their role of

leadership within the school. Second, teacher perception provides the follower's perspective of

the principal's leadership which can be used to measure the degree that a principal has provided

support and leadership opportunities to the teachers. Although a principal may view themselves

as supplying teachers with a positive academic climate, common mission, professional

community, direction for instruction and teacher leadership opportunities, the teachers may have

a different view of the degree that the principal has actually communicated and provided these goals and opportunities.

A growing body of typology research has begun to examine these roles of leaders and followers within leadership in contrast to the previous leadership style research which groups variables, or behaviors, into leadership styles and examines the extent that these leadership styles influence outcomes, or are effective. Instead, typology research investigates the similarities and differences between the roles, or persons, within leadership and groups these leaders and followers into types or subgroups. These distinguished types of principals or teachers, a person-centered approach, provides a clearer distinction of the ways in which leaders actually differ across schools not found in previous research on effective or "idealized" of leadership styles, a variable-centered approach. Investigations into types of leaders groups principals based on their similar approach to behaviors found across many leadership styles. The application of typology frameworks to school leadership allows for an examination of the ways in which types of leaders actually differ in their use of leadership behaviors, drawn from multiple leadership styles used in the leadership effectiveness research over the past few decades. The next section discusses the research to date on the ways in which types of leaders have varied by their behaviors.

Types of Leaders

A dearth of research has examined leadership with an analysis of the leader rather than an analysis of associations between leadership behaviors and outcomes. In other words, few studies have sought to empirically identify leaders as belonging to a subgroup of leaders, or type of leaders. Rather, researchers have been preoccupied with descriptions of leadership through the inclusion of particular measures into a construct and the extent to which each construct predicts an outcome.

Throughout business literature, several studies have utilized cluster analysis to explore the ways in which leaders can be grouped into types of leadership. These studies have categorized managers based on how they spend their time (Oshagbemi, 1988; Stewart, 1984, 1988), levels of satisfaction (Oshabemi, 1997), and leadership philosophy (Korac-Kakabadse *et al*., 1998). The most relevant study included measures of leadership behaviors from prominent types of leadership. Oshagbemi and Ocholi (2006) using surveys of managers in various UK industries identified subgroups of leaders based on their responses to items measuring behaviors of participatory, laissez-faire and transformational leadership. The authors identified three types of leaders that they named: practical leaders, unity leaders, and uncaring leaders. Practical leaders indicated that they demonstrated delegation, individual consideration and inspirational motivation to a greater extent compared to other leadership behaviors. Unity leaders responded that they more often consulted with members of the organization and shared many of the same behaviors as practical leaders. Uncaring leaders more often selected never, occasionally and fairly often as responses to most leadership behaviors.

Cluster analysis has been utilized within the field of educational leadership. Goldring, Huff, May and Camburn (2008) used cluster analysis to identify principal subgroups. The researchers collected daily logs from 46 principals that detailed their leadership tasks for six consecutive days. Leadership tasks included building operations, finances, community or parent relations, district functions, student affairs, personnel issues, planning/setting goals, instructional leadership, and professional growth. From the daily logs, cluster analysis revealed three types of principals that the authors termed: eclectic leaders, instructional leaders, and student leaders. Eclectic leaders spread their time across different tasks. Instructional leaders mainly focused on instruction. Student leaders dealt with student affairs to a greater extent. After cluster analysis,

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Goldring and associates included context variables in a discriminant analysis to assess the extent to which school characteristics distinguished the subgroups. Eclectic principals more often led schools with higher academic press, increased student engagement, and a lower percentage of socioeconomically disadvantaged students. The authors postulated that these principals had more time to devote to a variety of tasks since their school potentially had greater staff capacity. These findings further exemplify the multidimensionality of leadership behaviors through the identification of different types of leaders. In addition, Goldring *et al.* (2008) have shown that these types of leadership are contingent upon context within education. Principal practice differs by school context.

While Goldring, Huff, May and Camburn (2008) have demonstrated that there are different types of principals not previously determined by leadership style research and these types potentially differ by their school characteristics and demographics, the use of cluster analysis as a typology methodology is somewhat problematic. Cluster analysis attempts to group individuals by their responses to a set of survey items or other distinguishing measure (Gower, 1967). Each individual is represented by a point in Euclidean space (Gower, 1967). The distance between the different points of individuals classifies them into homogeneous subgroups (Scott & Knott, 1974). Different classification rules, such as nearest neighbor, or nearest centroid, specify how this distance is analyzed in order to classify the individuals (Breackenridge, 1989). For this reason, the results of the cluster analysis and their interpretation are relative to the particular chosen method of distance (Gower, 1967).

Nylund, Bellmore, Nishina and Graham (2007) have argued that latent class analysis (LCA) has several advantages over cluster analysis. First, the results from LCA can be replicated with an independent sample due to the use of a probabilistic model (Muthén & Muthén, 2000;

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Nylund *et al*., 2007). Second, LCA does not require the standardization of variables (Nylund *et al*., 2007). Third, LCA allows for the inclusion of covariates and outcome variables (Janosz *et al*., 2008; Muthén, 2008; Nylund *et al*., 2007). Finally, and most importantly, LCA provides fit statistics to assess the model and ultimately to help decide on the number of classes that best fit the data (Henry & Muthén, 2009; Nylund *et al*., 2007). The main purpose of cluster analysis is to explore the different ways in which individuals within a sample can be grouped. Yet, latent class analysis begins to confirm the number of classes that are appropriate for the model based on the fit statistics. These fit statistics allow a researcher to compare these subgroups to the theorized subgroups. Further, a researcher is able to include covariates and outcome variables into an omnibus model with the LCA based on its structural equation modeling framework (Muthén, 2002). Latent class analysis is an appropriate method to study the different types of principals and teachers who participate in school leadership while controlling for the school context.

Evidence from the study of leadership styles has shown that descriptions of different leadership styles are multidimensional since the variables used to describe the behavior of each style positively relate or overlap. From distributed leadership findings, we know that the interaction between leader, follower and situation constitute school leadership and vary by school. However, to date, no study has utilized a nationally representative sample to examine the ways in which leadership practice has significantly differed by types of principals, or teachers within schools. In extension, the study of leadership has lacked a person-centered, rather than a variable-centered, approach to leadership, which would more appropriately group leaders into subgroups by their common behaviors to demonstrate how principals and teachers have varied across U.S. schools.

These differences in overall leadership practice could be modeled through the interaction, or two-way relationship (Rost, 1993), between types of leaders and types of followers moderated by the situational context as suggested by distributed leadership perspectives (Spillane, 2006). Previously, the study of these interactions of leadership practice has been characteristic of in-depth, qualitative study. Limited samples have not fully described the ways in which this complex system has differed across a field of study. Investigation into different types of principals and types of leaders while accounting for teacher, principal and school characteristics would confirm and extend educational leadership theory about alignment of leadership practices among particular teachers and principals within specific schools. This more accurate model of the relationship between different types of teachers and principals within school leadership would demonstrate the fit between principal and teacher perception as well as a more complex description of the work conditions within the school.

Measures of Teacher Retention and Attrition

The work conditions created by the leadership within the school influences teachers' attitudes about whether or not they want to stay at the school (Dorman, 2003; Loeb, Darling-Hammond & Luczak, 2005; Hulpia, Devos & Rosseel, 2009; Skaalvik & Skaalvik, 2010; Somech & Ron, 2007; Zembylas & Papanastasiou, 2005). Whether or not a teacher wants to stay in the school has been measured by attitudinal variables such as job satisfaction, job commitment, empowerment and intention to stay as well as teacher retention, mobility and attrition variables such as the event of the teacher staying, moving or leaving schools (Hakanen, Bakker & Schaufeli, 2006; Hanushek, Kain & Rivikin, 2004; Loeb, Darling-Hammond & Luczak, 2005).

Several different measures of teacher retention are included in the literature. Psychosocial measures have been included in studies as an outcome related to teacher retention. Most of the attitudinal or psychosocial variables have been found to significantly predict the event of teacher retention (e.g. Grayson & Alvarez, 2008). Some of the main psychosocial variables tested have been burnout (Grayson & Alvarez, 2008), job satisfaction (Bogler, 2001), intent to leave/stay (Shapira-Lishchinsky & Rosenblatt, 2009), professional commitment (Billingsley & Cross, 1992), organizational commitment (Hakanen, Bakker & Schaufeli, 2006), and teacher empowerment (Rinehart, Short, Short & Eckley, 1998). However, how teachers feel about a school or the profession may not always reflect whether or not they will leave. While these psychosocial outcomes have allowed researchers to conduct cross-sectional rather than longitudinal research, at the same time, the varied use of attitudinal outcomes does not provide comparable findings for the advancement of teacher retention research. If the goal of teacher retention research is to predict and manage the loss of teachers, these attitudinal outcomes prevent a direct connection between conditions and the probability that a teacher will leave.

With follow-up or longitudinal data, teacher retention has been specified by three categories, retention (stay at school), attrition (leave teaching) and mobility (move schools). These categories have been frequently utilized with few other distinctions. They have been most appropriate for samples of first year teachers (Stockard & Lehman, 2004). However, when addressing issues of teacher shortages, teacher turnover is categorized with more distinction. Teacher attrition has been separated into pre-retirement and retirement (Ingersoll, 2001; Ingersoll & Perda, 2010; Ingersoll, 2002). Ingersoll (2002) has suggested that pre-retirement teachers account for a larger portion of retention based on the reasons of dissatisfaction and pursuit of other jobs. Distinctions between these occupational leavers and necessity leavers have rarely

been discussed. Further teacher attrition categories can be created to describe a teacher's reason for leaving the occupation before retirement. A separate body of literature exists on the difficulties of firing teachers. In this case, teacher attrition might be viewed as a positive outcome. However, difficulties in firing teachers demonstrate that the group of teachers involuntary dismissed may be relatively small. Ingersoll (2002) has concluded that teacher turnover is an issue because of pre-retirement, dissatisfied teachers.

The following theoretical framework outlines how previous research and theory on school leadership and teacher retention align with a typology approach to understand the ways in which different types of principals and teachers in school leadership help to explain whether or not a teacher will stay or leave the school the following year.

Theoretical Framework

Leadership practice has differed across schools because of context specific needs. Leadership practice has been defined as the relationship between principal, teachers and school context (Spillane, 2006). More effective principals adjust their leadership behavior according to teacher needs (Slater & Teddlie, 1992). This process of alignment of leadership behaviors to teachers will continually help principals develop the leadership practice (Graeff, 1997). Research that has included more than one leadership style has demonstrated that school leaders may exhibit several styles simultaneously to better serve teachers so that they choose to remain at a school.

School Context

Few studies have taken into account that leadership varies across schools based on the school context. To date, no study has utilized nationally representative data to demonstrate how leadership significantly varies by school context across the U.S. Based on previous literature, I

argue that principals mediate information about the school context, such as district accountability, teacher and student background etc., in order to assess how to direct their own leadership (see Glasman & Heck, 1992; Leithwood & Jantzi, 2008; Leithwood *et al.*, 2007; Portin *et al.*, 2009; Spillane, 2006). With this information, principals formulate perceptions about which leadership behaviors will be successful, then create school conditions with their chosen leadership (Leithwood & Jantzi, 2008; Portin *et al.*, 2009; Spillane, Camburn & Pareja, 2007). This argument aligns with contingency theory which states that based on the situation, such as the task to be accomplished, and the composition of the group to perform the task, a leader selects whether to take a more task oriented, managerial, or controlled approach, or relationship oriented, transformational or shared approach (Fiedler, 1964; 1966; 1967). Rowan (1990) further explains:

> …organic forms of management [such as shared instructional leadership] may not enhance instructional effectiveness across all conditions of classroom organization. In fact, when the technology of instruction is routinized, as it is in many behavioristic instructional systems that have tightly specified curriculum hierarchies and tie student progress to testing, a mechanistic and control-oriented strategy may be appropriate and lead to increased instructional effectiveness (pp. 382-3).

This assertion of a context-based leadership extends beyond correctly supporting teachers and effective instruction through either controlled or shared leadership (see Firestone & Wilson, 1985; Rowan, 1990; Miller & Rowan, 2006). Each characteristic of the school, students, teachers and principal influences a principal's leadership behavior in a different way (Goldring, Huff, May & Camburn, 2007; Glasman & Heck, 1992; Hallinger & Murphy, 1986; Krüger, Witziers & Sleegers, 2007; Mayrowetz, Murphy, Louis & Smylie, 2007).

Types of Principals and Teachers

    Throughout research on leadership styles, subsequent styles in combination with previous styles have increased school, student or teacher outcomes. For example, variables of transactional leadership in combination with transformational leadership have a greater impact on school outcomes than transactional leadership alone (Bass, 1985a; Lowe *et al*., 1996; Nguni *et al*., 2007). The same results have been found with transformational and shared instructional leadership (Hallinger, 2003; Marks & Printy, 2003; Printy, Marks & Bowers, 2009). However, in order for a school to reach shared instructional leadership which is considered the most effective style (Marks & Printy, 2003; Robinson, Lloyd & Rowe, 2008), teachers must develop into leaders in the school (Mangin, 2007; Printy 2008). For this reason, school leadership perceptions and roles of both principals and teachers are important. The ways in which principals and teachers perceive leadership decisions or behaviors in the same school differ (Anderson, 1991; Goldring *et al*., 2012). Each perception provides evidence about the ways and extent to which shared leadership is practiced.

    A typology of both principals and teachers based on their perceptions of the leadership styles practiced within the school would help to distinguish between the different roles of principals across schools and teachers within the school through the identification of significantly different types of principals and teachers. In addition, principal perception and teacher perception of the leadership styles practiced should be modeled as an interaction for two reasons. First, previous theory on the distributed leadership perspective (Spillane, 2006) and the relationship between leaders and followers (Rost, 1993) postulates that there is a two-way relationship, or exchange, between leaders and followers. Both formal and informal leaders adjust their leadership based on the communication of perceptions and needs across leaders and

followers. Similar to Hallinger and Heck (2011), I argue that this interaction between teachers and principals contributes to the variation in leadership practices across schools.

Second, multidisciplinary literature on leadership evaluation (e.g. Alimo-Metcalfe, 1998; Offermann & Hellmann, 1996; Skipper & Bell, 2006) suggests that multiple perceptions of the leadership provided a more accurate assessment of the extent to which leaders provide the appropriate support for organizational members. More specifically, the investigation of the extent to which leader perceptions relate to follower perceptions provides the best description of leader development and advancement compared to the relationship between perceptions of other surrounding roles (Halverson, Tonidandel, Barlow & Dipboye, 2002). These findings stem from validity assessments of 360 leadership evaluations from the responses of superiors, leader and followers. From which, findings have emphasized the particular importance of self, or leader, and follower perceptions of leadership for simultaneous use in the measurement of leader potential (Halverson, Tonidandel, Barlow & Dipboye, 2002). There is only emerging research on these same validity issues for 360 evaluations for principals (e.g. Goldring *et al.*, 2012). When applied in education, the congruency of principal perception with teacher perception would demonstrate the extent to which they have accomplished their goals or demonstrated an organizational effect.

In contrast, disconnects between principal and teacher perception would supply suggestions of their behaviors that could be improved. Emerging research on the congruency between teacher and principal perception of leadership has shown that a divergence might be due to a lack of fit between teacher and principal. Goldring, Cravens, Murphy, Porter and Elliott (2012) preliminarily found that teachers may conflate their view of leadership with the charisma of the principal. This potentially demonstrates that teachers who personally like their principal

would have a more positive view of the leadership within their school. These results would

support a more purposeful or limited use of teacher perception in school leadership research.

This evidence of a more nuanced meaning behind teacher perceptions of leadership suggests that

teacher perception might be an indication of their satisfaction within their school, which would

directly link to decisions of whether or not to stay or leave. In sum, both teacher and principal

perceptions are important since they participate in shared leadership. Further, the investigation of

the interaction between teachers and principals in leadership provides a representation of the

extent to which principals supply teachers with what they need or a perceived fit.

Types of Principals and Teachers and Teacher Retention and Attrition

Principals who practice shared instructional leadership, which has the largest impact on

student achievement and outcomes (Marks & Printy, 2003; Robinson, Lloyd & Rowe, 2008),

may retain more pre-retirement teachers from leaving education as a profession compared to

principals who have not established shared instructional leadership within their school. The

majority of research on the attitudinal variables, satisfaction, commitment, intent to leave, related

to teacher retention has shown that shared and transformational leadership, components of shared

instructional leadership, promote a teacher's decision to remain at a particular school and in the

profession (Dorman, 2003; Loeb, Darling-Hammond & Luczak, 2005; Hulpia, Devos & Rosseel,

2009; Skaalvik & Skaalvik, 2010; Somech & Ron, 2007; Zembylas & Papanastasiou, 2005).

The types of principals and teachers who view their school as practicing shared instructional

leadership would have fewer teachers who leave a school and teaching out of dissatisfaction

toward their job and work conditions.

To date, the different types of principals and teachers that exist across the U.S. based on

their perceptions of leadership styles practiced in the school are unknown. However, three main

conclusions from previous research and theory provide evidence that subgroups of principals and teachers are present in U.S. school leadership. First, the influence of school, principal, teacher and student demographics on outcomes varies by the leadership provided in the school. Leaders adjust their behavior based on the school context. Characteristics of the school context would help to distinguish between different types of principal and teacher leaders.

Second, the inclusion of both principal and teacher perception helps to define the different types of principals and teachers from the degree of congruency or disconnect between their views of the leaderships styles within the school. In addition, this relationship between perceptions would provide information as to the ways in which leadership develops within the school.

Third, I hypothesize that in schools where principals and teachers perceive the practice of shared instructional leadership fewer teachers will choose to leave the school or education as an occupation. Since we only have descriptions of "idealized" styles within the literature, the ways in which leaders who practice shared instructional leadership differ from other types of leaders is also unknown, but these other leaders might have more teachers who leave the school as well as education as a profession.

From these underlying explanations and proposed conclusions, this study seeks to answer the following research questions.

Research Questions

From the overarching guiding questions of this study,

1. What types of principals and teachers exist in school leadership across the U.S.?

2. To what extent do these different types of teachers and principals in school leadership predict teacher retention?

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This study addresses these research questions:

1. What are the different *types of principals* in school leadership across the U.S. and to what extent do these principal types predict teacher attrition?

    a. In what ways do principal perceptions of leadership styles practiced in their school identify the different types of principals across U.S. schools?

    b. To what extent are school and principal characteristics related to the different types of principals?

    c. To what extent do different types of principals predict categories of teacher retention and attrition?

2. What are the different *types of teachers* in school leadership across the U.S. and to what extent do these teacher types predict teacher attrition?

    a. In what ways do teacher perceptions of leadership styles practiced in their school identify the different types of teachers across U.S. schools?

    b. To what extent are school and teacher characteristics related to the different types of teachers?

    c. To what extent do different types of teachers predict categories of teacher retention and attrition?

3. In what ways do *principal and teacher types* adjust when accounting for the interaction between principal and teacher perceptions and to what extent does the identification of a teacher type in a school with a principal type predict teacher attrition?

    a. In what ways do principal and teacher types adjust when accounting for the interaction between principal and teacher perceptions?

b. To what extent do teacher characteristics influence teacher types when accounting for the interaction among teacher and principal perception?

c. To what extent do school and principal characteristics influence principal types when accounting for the interaction among teacher and principal perception?

d. To what extent do these principal types predict teacher types?

e. In what ways do the perceptions of teachers within a particular teacher type differ across the principal types?

f. To what extent do these principal and teacher types predict teacher attrition?

g. To what extent do teacher types in a school with a particular principal type predict teacher attrition?

CHAPTER THREE: METHODS

This chapter describes the methods used to address the research questions. A detailed description of the sample, analytic technique, variables, analytical models, and data analysis are provided below.

Sample

This study is a secondary analysis of the 1999-2000 Schools and Staffing Survey (SASS) and 2000-2001 Teacher Follow-up Survey (TFS). SASS and TFS, collected by U.S. Department of Education and National Center for Educational Statistics (NCES), are nationally representative surveys of about 56,350 public school teachers, 9,890 public schools and principals from 5,470 public school districts (NCES, n.d.). After the selection of variables and public school teachers with complete school data, the final sample used in the analyses included $n = 35,560$ teachers in $n = 7,310$ schools.

During the 1999-2000 school year, NCES surveyed principals and teachers about training, education, experience, goals, decision making, school characteristics, policies and programs (Gruber *et al.*, 2002; NCES, n.d.). During the 2000-2001 school year, teachers included in SASS for the TFS data collection were asked to respond to follow up questions in regards to employment changes, salary, education, and attitudes about teaching and job satisfaction in order to compare teachers who stayed at a school, left the profession or moved schools (NCES, n.d.). The information provided across SASS and TFS present a unique opportunity to evaluate the impact of leadership, various work conditions and background variables on teacher mobility and attrition. In particular, 1999-2000 SASS includes additional questions in both principal and teacher surveys about the frequency of leadership behaviors and distributed decision-making for school decisions, which are no longer included within more

recent SASS surveys. Thus, the 1999-2000 administration of SASS includes the most appropriate data to address the research questions of this study.

A large portion of the research that has included data from SASS and TFS has studied the extent to which various factors influence teacher retention. The research using SASS and/or TFS on teacher retention can generally be divided into two categories. Teacher retention research has focused on a) the influence of organizational effects (malleable), and b) the influence of demographic and background variables (less or non-malleable). Teacher background, school characteristics (Hancock & Scherff, 2010; Liu & Meyer, 2005; Renzulli, Parrott & Beattie, 2011; Sohn, 2009), administrative/peer support and an overall school climate (Kukla-Acevedo, 2009; Riehl & Sipple, 1996; Smith & Ingersoll, 2004) have predicted teachers' decisions of whether or not to remain at a school.

Several other studies have included data from SASS and TFS outside of the topic of teacher retention. Many of the same predictors linked to teacher retention have been studied separately. These topics have included a more in-depth study of work conditions (Desimone, Smith & Phillips, 2007; Grodsky & Gamoran, 2003; Ingersoll, 1996; Weathers, 2011) and teacher, principal and school characteristics (Baker & Dickerson, 2006; Bifulco & Ladd, 2005; Cannata, 2007; Lee & Wong, 2004; Renzulli, 2006; Riehl & Byrd, 1997; Van Hook, 2002; Verdugo & Schneider, 1994). Using SASS, researchers have demonstrated the importance of school leadership in the creation of positive work environments for teachers. The ability of principals to manage these work conditions has led to an increase in teacher outcomes that have helped to promote greater school quality (Desimone, Smith & Phillips, 2007; Grodsky & Gamoran, 2003; Ingersoll, 1996; Weathers, 2011). Further examination of SASS teacher, principal and school characteristics have described how teachers and principals are distributed

across specific schools. In addition, these results have shown the ways in which these background characteristics have contributed to educational outcomes.

In regards to the full survey sample, the 1999-2000 Schools and Staffing Survey (SASS) was designed to survey approximately 15,500 principals and 77,000 teachers in 15,500 public, public charter, private and Bureau of Indian Affairs (BIA) schools and 5,700 public school districts in the United States. This is a nationally representative sample of teachers, principals, schools, districts and states (McGrath & Luekens, 2000). In addition, teacher responses can be aggregated to the school level for a representative sample of teachers within schools (McGrath & Luekens, 2000). The surveying of teachers and principals as well as other educators provides measures of several key factors of schooling from multiple vantage points for use in analyses with generalizability to all schools in the United States in 1999-2000.

SASS is a stratified probability proportional to size sample (PSS) with schools as the primary sampling unit (Battle & Gruber, 2009; Coopersmith & Gruber, 2009; Keigher & Gruber, 2009). All schools, except BIE–funded schools (Bureau of Indian Education), undergo stratification. Survey weights are included in both SASS (SFNLWGT, TFNLWGT) and TFS (TFSFINWT) in order to account for the sampling technique (Battle & Gruber, 2009; Coopersmith & Gruber, 2009; Keigher & Gruber, 2009). When used in statistical analysis, weights correct the standard error for each respondent of a subgroup within unit (Strayhorn, 2009). Underestimated standard error from sampling bias, or too high of a frequency of similar responses from oversampling a subgroup, increases the probability of a Type I error, or a false rejection of the null hypothesis (Stapleton, 2002). A separate set of weights are provided for each unit in SASS. Weights have been calculated for schools, teachers in schools, and districts, so that each of these levels has appropriate national and hierarchical representation. The use of

multilevel modeling with applied sample weights is suggested to correct for oversampling of subgroups, which includes the clustering of homogeneous subgroups as well as overall representation of subgroups (Hahs-Vaughn, 2005; Hox & Kreft, 1994; Muthén, 1994). Appropriately accounting for nested data with statistical modeling as well as the application of weights helps to reduce bias in a non-random sample and more accurately represents the population for national generalizations (Hahs-Vaughn, 2005; Hox & Kreft, 1994; Muthén, 1994; Strayhorn, 2009).

Analytic Technique: Latent Class Analysis

Using nationally representative data from the restricted-use 1999-2000 Schools and Staffing Survey (SASS) and 2000-2001 Teacher Follow up Survey (TFS), this study applies latent class analysis and multilevel latent class analysis to a) identify statistically different types of principals and types of teachers based on their perceptions of the leadership styles practiced, b) test the extent of the relationship between types of principals and teachers within the school and teacher context and c) examine the association between each identified leadership practice and teacher retention and attrition.

Latent Class Analysis (LCA) as a mixture model used within a structural equation model framework allows for the simultaneous examination of multiple variables and latent variables in a mediated, directional model to test a) the extent to which a set of control variables explain the different types of respondents, as well as b) the extent to which the different types of respondents explain an outcome variable (Asparouhov & Muthén, 2008; Duncan, Duncan & Strycker, 2006; Muthén, 2008; Muthén & Muthén, 1998-2007). In addition to the inclusion of control variables and an outcome variable, a mixture model or structural equation framework can handle the use of multilevel data. Multilevel mixture models utilize equations much like hierarchical linear models

(HLM), which adjust the standard errors based on measures from multiple units of analysis included in the data (Asparouhov & Muthén, 2008; Raudenbush & Bryk, 2002). Outside of a mixture model framework, latent class analysis is a nonparametric statistic.

Latent class analysis, a person centered statistic, helps to define unobserved subgroups from the relationships among the frequencies of the degree of response to a set of survey items, similar to a factor analysis, a variable centered statistic (McCutcheon, 1987). However, unlike factor analysis, latent class analysis identifies patterns of responses for latent subgroups of respondents rather than latent variables of survey items. This significance test of different subgroups provides a description of different types of teachers and different types of principals based on their response to survey items about the extent to which a particular leadership behavior exists within a school. At the same time, within a multilevel mixture model framework, the model will control for teacher level and school/principal level characteristics while assigning each teacher and principal to a subgroup based on their most likely membership to examine its association with a distal outcomes and for use in subsequent analyses.

The results of this model demonstrate types of teachers based on their perceptions of leadership and to what extent types of principals and background characteristics influence these latent types of teachers. In sum, this model will identify in what ways school leadership has varied across schools based on the perceptions of teachers and principals and ultimately the extent to which these perceptions have influenced particular types of teachers to either leave, stay or move schools. These findings will help educators identify which types of teachers with which types of principals are most likely to leave the teaching profession or education as a profession. The following section further details how these latent subgroups of teachers and principals are identified with latent class analysis.

History of Latent Class Analysis

Mixture modeling is an attractive form of analysis for the examination of variation across subgroups because of adaptable equation and nonparametric assumptions. Latent class analysis, an analysis within mixture modeling, provides researchers with a statistical test of the extent of heterogeneity in a population. Latent class analysis has evolved from a basic analysis of frequency tables to multinomial logistic regression, which uses estimates from a multilevel regression in a structural equation framework. The following literature review outlines the major developments in latent class analysis, which have led to the more recent advancements as a mixture model. This literature review ends with a discussion of issues related to LCA as a mixture model and a summary of the review.

LCA as an analysis of frequency tables. The basic latent class analysis (LCA) uses crosstabulation to demonstrate the interrelationship among responses to a set of items (McCutcheon, 1987; Rindskopf, 2009). A separate unobserved variable is tested through the examination of the extent to which a group of responses to items is independent of another group of responses (McCutcheon, 1987; Rindskopf, 2009). For example, a researcher wants to group teachers into two categories based on beliefs about student motivation. The teachers are provided two responses to each survey item about classroom situations. One response shows their belief that they have the ability to motivate students. One response demonstrates their belief that students must motivate themselves. The survey items provided measure separate, observable indicators of student motivation. A teacher who responds that he/she would be able to motivate a student to participate in most situations would be classified as believing student motivation is malleable. A teacher who responds that he/she would not be able to motivate a student to

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participate in most situations would be classified as believing student motivation is not

malleable. This LCA utilizes observed measures of the latent factor, student motivation, to

describe the extent to which teachers exhibit the hypothesized two classes of beliefs. This

simplistic LCA yields two statistics, a latent class probability and parameter estimates. The latent

class probability describes the size of the population within one class compared to the other

class(es). Parameter estimates are calculated for each survey item to illustrate the percentage of

teachers who responded positively to each question, which reveals the extent of the positive or

negative beliefs about student motivation for each class. Finally, based on a modal probability

from the assignment of teacher responses to classes, each teacher is classified into a latent class.

LCA as a multinomial logistic regression. Researchers in social and organizational

sciences have extended LCA to logistic regression frameworks for the inclusion of covariates.

The use of logit and multinomial logit regression, for more than two classes, expands the purpose

of LCA beyond the identification of independent classes. The addition of covariates into LCA

suggests some degree of dependence between classes (Formann, 1992). Maximum likelihood

estimations with EM algorithm have been utilized to test the relationship between variables

(Asparouhov & Muthén, 2008; Formann, 1992; Rindskopf, 2009). Further, logistic regression

frameworks has allowed for the simultaneous use of both parametric and nonparametric items.

To adjust for the use of both forms of data, corrections to the likelihood ratio have modified the

statistic for use with non-normal data and unequal variances (Lo, Mendell & Rubin, 2001; Lo,

2005). Lo (2005) has argued that likelihood ratio test to determine the number of components, or

classes, in a normal mixture produces results similar to rigorous bootstrap methods and posterior

predictions. Likewise, in a simulated study with three different sample sizes, Nylund,

Asparouhov and Muthén (2007) found likelihood ratio test to be a consistent indicator of classes

across all samples. The adjustment of estimation to fit nonparametric and parametric measures in LCA has helped to expand the use of LCA in research.

Merging of latent variable analyses into mixture models. The developments in LCA as a regression have allowed its purposes to mirror other similar analyses as part of an overall mixture model framework. Vermunt (2008) has argued that finite mixture, a parametric statistic, and LCA have become interchangeable terms since LCA regression "makes it possible to take into account unobserved population heterogeneity with respect to the coefficients of a regression model" (p.23). Muthén (2008) has explained the relationship between similar forms of latent variable modeling. Muthén (2008) has suggested that these analyses can be distinguished by their assumptions of measurement invariance and the inclusion of error terms for parametric data. Muthén (2004, 2006, Muthén & Asparouhov, 2009) has included LCA, mixture factor analysis, growth mixtures analysis, factor mixture analysis and non-parametric factor mixture analysis under the term latent variable hybrid modeling, and has incorporated them extensively into growth mixture model frameworks. Muthén (2008) has argued that when measurement invariance, or fixed intercepts, slopes or thresholds across clusters, participants or groups, is not assumed in the analysis, then models have a better fit for the data since growth trajectories or typologies are allowed to vary across classes. The inclusion of these random effects along with the merging of latent variable analyses has extended the purpose of LCA in research. Some of these purposes include description and validity of person- and variable- centered aspects (Evans & Mills, 1998; Muthén & Muthén, 2000), confirmation of theories related to subpopulations (Muthén & Muthén, 2000; Vermunt & Magidson, 2004), testing of measurement invariance across populations (Eid, Langeheine & Diener, 2003) and density estimation which uses simpler densities to approximate complex density (Vermunt & Magidson, 2004). However, recent, more

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mainstream uses of mixture modeling in education have drawn on equations from multilevel regression and structural equation modeling.

The strengths of multilevel regression and structural equation modeling have allowed the use of multiple categorical and continuous variables as measures of unobserved latent factors or classes with hierarchical data in mixture models (Muthén, 2004; Asparouhov & Muthén, 2008). Like the first shift from frequency tables to logistic regression frameworks, the use of multilevel regression equations adapted for representation of different factors or classes through matrices and vectors of observed variables and covariates has furthered the flexibility of latent class equations (Asparouhov & Muthén, 2008). Through multilevel regression equations, researchers have been able to specify which covariates vary across factors or classes. In addition, the examination of different classes has been specified at the individual level, the organizational level or both. Auxiliary statistics and regressions have also been adjusted to fit data and research questions. Estimates from the multilevel regression are utilized in a multinomial logit regression to estimate the probability of each class. Various fit statistics have compared models of sequential complexity to assess model fit for data (Henry & Muthén, 2010). Finally, Bayes theorem has been used to assign respondents or cases to latent classes (Rindskopf, 2009). Although these models have limited assumptions of normality and extended the flexibility of how parameters are included, conclusions based on the results are limited to model specifications and tests.

Over recent years LCA has evolved into a statistic underneath an overarching framework of mixture models. Developments in LCA from a crosstabulation or chi square to a logit regression allowed for the relationship between observed items to include covariates. This shift changed the nature of LCA from a focus on class independence to an emphasis on conditional

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dependence among measures. The use of multilevel regression as a precursor to multinomial logistic regressions for class probability has allowed for the inclusion of multilevel levels of data within the latent classes. The multilevel regression equations can be manipulated to better specify the placement of latent classes as well as the nature of variables as random effects, or varying across participants or clusters which accounts for error. Although the extension of LCA into mixture models has improved data modeling through the use of non-normal growth trajectories and random effects to explain variation across classes, interpretation of the results are limited to model specifications, significance tests and connections to theory.

Equations for Latent Class Analysis

A nonparametric statistic, latent class analysis examines unobserved subgroups from the relationships among frequencies of the degree of response to a set of survey items (McCutcheon, 1987). In order to include covariates, a multinomial logistic regression is utilized to predict the probability of each subgroup, or latent class, while accounting for the extent of influence from related variables (equation 1.1 below).

In order to gain multilevel estimates for the multinomial logistic regression, Asparouhov and Muthén (2008) represent the relationship between level 1 (teacher) and level 2 (school/principal) covariates for each latent class using equations similar to hierarchical linear modeling. Group means, or a cluster level mean for each latent class, or a between cluster intercept, along with coefficients for each covariate, are estimated with three main equations. First, a set of observed survey items are explained by normally distributed latent variables to describe each latent class (equation 2.1).

Next, descriptions of each latent class and these latent variables are defined by the combined influence of these latent variables and level 1 covariates (equation 2.2). For the

inclusion of level 2 covariates, the cluster level intercepts, previously defined by only level 1

random effects that vary across classes, are now explained by the combined influence of level 1

random effects and level 2 covariates (equation 2.3). These cluster level random intercepts allow

the extent of influence from level 1 and level 2 variables to vary across each latent class

(Asparouhov & Muthén, 2008).

In sum, initial relationships among survey items are estimated, then level 1 and level 2

covariates are included to help explain how the relationships among survey item responses vary

for each latent class (see figure 1). After utilizing cluster level estimates from the multilevel data

in the multinomial logistic regression to calculate the probability of each latent class, each

respondent is assigned a probability of membership to a particular class. Ultimately, the

probability for teachers to stay, move or leave is calculated for each latent class.

Equation 1: Multinomial Logistic Regression

The probability for each latent class is:

$$P(C_{ij} = c) = \frac{\exp(\alpha_{cj} + \boldsymbol{\beta}_{cj}x_{ij})}{\sum\limits_{c} \exp(\alpha_{cj} + \boldsymbol{\beta}_{cj}x_{ij})} \quad\quad (1.1)$$

Equation 2: Two-level Mixture Model

Latent classes and a vector of survey items is explained by level 1 latent variables (2.1), level

1 covariates (2.2) and level 2 random effects (2.3):

$$[\mathbf{y}^*_{ij} \, C \, |_{ij} = c] = \mathbf{v}_{cj} + \boldsymbol{\Lambda}_{cj}\boldsymbol{\eta}_{ij} + \boldsymbol{\varepsilon}_{ij} \quad\quad (2.1)$$
$$[\boldsymbol{\eta}_{ij} \, C \, |_{ij} = c] = \boldsymbol{\mu}_{cj} + \mathbf{B}_{cj}\boldsymbol{\eta}_{ij} + \boldsymbol{\Gamma}_{cj}x_{ij} + \boldsymbol{\xi}_{ij} \quad\quad (2.2)$$
$$\boldsymbol{\eta}_j = \boldsymbol{\mu} + \mathbf{B}\boldsymbol{\eta}_j + \boldsymbol{\Gamma}\mathbf{x}_j + \boldsymbol{\xi}_j \quad\quad (2.3)$$

in which

α_{cj} = random cluster level intercept

$\boldsymbol{\beta}_{cj}x_{ij}$ = differentiating effects for each latent class

$\mathbf{y*}_{ij}$ = all continuous or discrete survey items, dependent variables
C_{ij} = within level latent classes
$\mathbf{v}_{cj}$ = intercepts for each class
$\mathbf{\Lambda}_{cj}\mathbf{\eta}_{ij}$ = the slopes of the intercepts varying by latent variables
$\mathbf{\varepsilon}_{ij}$ = normally distributed residuals
$\mathbf{\eta}_{ij}$ = normally distributed latent variables
$\mathbf{\mu}_{cj}$ = intercepts for each class
$\mathbf{B}_{cj}\mathbf{\eta}_{ij}$ = the slopes of the intercepts varying by latent variables
$\mathbf{\Gamma}_{cj}\mathbf{x}_{ij}$ = the slopes of the intercepts varying by covariates
$\mathbf{\xi}_{ij}$ = normally distributed residuals
$\mathbf{\eta}_{j}$ = random effects at between level
$\mathbf{\mu}$ = between level intercepts
$\mathbf{B}\mathbf{\eta}_{j}$ = the slopes of the intercepts varying by between level random parameters
$\mathbf{\Gamma}\mathbf{x}_{j}$ = the slopes of the intercepts varying by between level covariates
$\mathbf{\xi}_{j}$ = normally distributed residuals

Variables

Three sets of measures are included in the analyses: teacher, principal/school and teacher

retention measures. Teacher and principal/school measures include both demographic variables

as well as survey items that describe the leadership in their school. For teacher and principal

perception of leadership variables, four-choice items were dichotomized since the distribution of

responses for most variables did not represent a normal degree of variance, conceptually they

represented two answer choices, and a reduction in the number of answer choices to items

included as outcomes of the latent class analysis simplifies the model (McCutcheon, 1987;

Rindskopf, 2009). Perception items with five-choices, a neutral response, or an interval scale,

conceptually not two choices, remained as continuously scaled items. Teacher retention variables

consist of the broad categories of movers, stayers, leavers, and more specific categories that

distinguish between pre-retirement and retirement leavers, or position, occupation and necessity

leavers.

Teacher Variables

  Teacher background. Teacher demographics and characteristics included in the analyses

control for their background and provide a context for which teachers are more likely to belong

to a particular teacher subgroup. In line with previous findings, teacher background variables in

the analysis are *gender* with male as a reference group (Liu & Ramsey, 2008; Podgursky *et al.,*

2004; Timms, Graham & Caltabiano, 2006; Unterbrink *et al.*, 2007), *ethnicity* with white as a

reference group (Billingsley & Cross, 1992; Hanushek, Kain & Rivkin, 2004; Keigher, 2010;

Strizek *et al.,* 2006), *years of teaching experience* (Boyd *et al.*, 2006; Rivkin, Hanushek & Kain,

2005; Rockoff, 2004; Shen, 1997), *whether or not teacher has master's degree* (Ingersoll &

Alsalam, 1997; Kirby, Berends & Naftel, 1999; Lok & Crawford, 2004; Singh & Billingsley,

1998) and *teacher salary* (Guarino, Santibanez & Daley, 2006; Ingersoll, 2001) (*see table 1*).

Table 1. Descriptives for teacher background

Variables	1999-2000 SASS Variable	Min	Max	Mean	SD
Teacher background					
Years teaching experience	T0065	0	57	13.90	10.01
Has master's degree	T0080	0	1	0.44	0.50
Teacher salary in 1000s	T0347/1000	0	195	36.39	12.03
Female teacher	T0356, 1=Female	0	1	0.67	0.47
Hispanic teacher	RACETH_T, 1=Hispanic	0	1	0.04	0.20
African American teacher	RACETH_T, 1=African American	0	1	0.06	0.24
Asian teacher	RACETH_T, 1=Asian	0	1	0.02	0.13

  Teacher perception of leadership. Based on the literature reviewed, teacher survey

items were selected to represent teacher perception of the principal leadership as well as teacher

perception of teacher leadership. Teachers responded to items that describe the principal's

transactional, transformational and instructional leadership as well as their own influence over transactional and instructional leadership tasks.

Teacher perception of principal leadership. Teacher perception of the principal's transactional leadership include both continuous, *hours in school/work*, *planning hours*, and dichotomous variables, *satisfied with salary*, *misbehavior doesn't interfere with teaching*, *principal enforces discipline, adequate materials, other duties such as paperwork don't interfere with teaching, support for special needs students, satisfied with class size, tardiness doesn't interfere with teaching*, 0 = disagree and 1 = agree (Bass, 1985; Guarino *et al*., 2006). Teacher perception of principal transformational leadership is measured by *how useful is professional development*, 0 = not useful to 4 = very useful which includes a neutral choice so this item was not dichotomized, and dichotomous variables of whether or not teachers agree that the *principal communicates expectations, principal communicates what kind of school, staff is recognized, administration is supportive, parents support, colleagues share beliefs,* and *staff is cooperative* (Hallinger, 2003; Leithwood, 1994, 1999). In addition, teachers responded to dichotomous items which describe principal instructional leadership, whether or not the *principal discusses instructional practices* as well as if they agree that teachers in their school *coordinate content with other teachers* (*see table 2*).

Table 2. Descriptives for teacher perceptions of principal leadership

Variables	1999-2000 SASS Variable	Min	Max	Mean	SD
Transactional Leadership					
Hours in school/wk	T0273	1	60	37.02	6.55
Planning hours	T0274, T0275	0	25	3.96	2.56
Satisfied with salary	T0301	0	1	0.36	0.48
Misbehavior doesn't interfere	T0302	0	1	0.60	0.49
Teachers enforce rules	T0308	0	1	0.58	0.49
Principal enforces discipline	T0306	0	1	0.81	0.39
Adequate materials	T0304	0	1	0.77	0.42
Other duties don't interfere	T0305	0	1	0.29	0.46
Support for special needs students	T0314	0	1	0.63	0.48
Satisfied with class size	T0315	0	1	0.71	0.45
Tardiness doesn't interfere	T0317	0	1	0.65	0.48
Transformational Leadership					
How useful- all prof dev	T0178	0	4	2.60	0.95
Parent support	T0303	0	1	0.57	0.50
Principal communicates expectations	T0299	0	1	0.86	0.34
Colleagues share beliefs	T0309	0	1	0.83	0.37
Staff is cooperative	T0311	0	1	0.77	0.42
Administration is supportive	T0300	0	1	0.78	0.41
Principal communicates what kind of school	T0310	0	1	0.81	0.39
Staff is recognized	T0312	0	1	0.66	0.47
Instructional Leadership					
Coordinate content with other teachers	T0316	0	1	0.81	0.39
Principal discusses instructional practices	T0307	0	1	0.43	0.50

Teacher perception of teacher leadership. Teachers answered survey items about the extent to which they have influence over transactional and instructional leadership tasks. Teachers rated the extent of teacher leadership, or influence, 0 = no influence to 4 = a great deal of influence, over school decisions such as *teacher hiring*, *discipline*, and *budget*, which measure the extent of their influence over transactional leadership tasks, and *performance standards*, *curriculum*, *professional development content*, *teacher evaluation*, which measure instructional leadership. Finally, as an additional measure of instructional leadership, teachers rated their degree of classroom autonomy, or control, 0 = no control to 4 = complete control, in the

classroom for the *selection of materials*, *selection of content*, *selection of technique*, *student evaluation*, *classroom discipline*, and *homework* (*see table 3*). These measures reflect the past literature which emphasizes teacher leadership as a factor which contributes to effective school leadership and a teacher's decision of whether or not to leave teaching or a school the following year (Dorman, 2003; Loeb, Darling-Hammond & Luczak, 2005; Hulpia, Devos & Rosseel, 2009; Robinson, Lloyd & Rowe, 2008; Skaalvik & Skaalvik, 2010; Somech & Ron, 2007; Zembylas & Papanastasiou, 2005).

Table 3. Descriptives for teacher perceptions of teacher leadership

Variable	*1999-2000 SASS Variable*	*Min*	*Max*	*Mean*	*SD*
Transactional Leadership					
Teacher influence on teacher hiring	T0290	0	4	1.01	1.17
Teacher influence on school discipline	T0291	0	4	1.75	1.22
Teacher influence on school budget	T0292	0	4	1.05	1.13
Teacher influence on teacher evaluation	T0289	0	4	0.82	1.04
Teacher control over classroom discipline	T0297	0	4	2.93	0.96
Instructional Leadership					
Teacher influence on school performance standards	T0286	0	4	2.08	1.23
Teacher influence on school curriculum	T0287	0	4	2.33	1.21
Teacher influence on school prof dev content	T0288	0	4	1.88	1.20
Teacher control over classroom selection of materials	T0293	0	4	2.65	1.18
Teacher control over classroom selection of content	T0294	0	4	2.70	1.15
Teacher control over selection of technique	T0295	0	4	3.43	0.79
Teacher control over classroom student evaluation	T0296	0	4	3.49	0.73
Teacher control over classroom homework	T0298	0	4	3.51	0.78

School and Principal Variables

      School characteristics and principal background. School demographics and principal background variables control for the school context in the analyses. School demographics include *urbanicity* with suburban as a reference group, *school size* with medium enrollment as a

reference group, *grade level* with secondary level as a reference group, *percent of minority students*, and *student/teacher ratio* which influence school leadership (Hallinger, Bickman & Davis, 1996; Louis *et al.*, 2010). The variable, whether or not the school *met state and/or district goals* for the previous school year, indicates the current accountability context of the school, which relates to leadership decisions and effectiveness (Hallinger & Heck, 2011; Weathers, 2011). Lastly, principal *gender* with male as a reference group, *ethnicity* with white as a reference group, *highest level of education*, *years of experience as a principal and years of experience as a teacher* describe a principal's background and has been found to influence their perceptions and decisions (Bowers & White, 2011; Hallinger, Bickman & Davis, 1996; Louis *et al.*, 2010; Urick & Bowers, 2011) (*see table 4*).

Table 4. Descriptives for school characteristics and principal background

Variable	1999-2000 SASS Variable	Min	Max	Mean	SD
School Demographics					
Urban	URBANIC, 1=Urban	0	1	0.23	0.42
Rural	URBANIC, 1=Rural	0	1	0.32	0.47
Small enrollment	S0101, 1=1-599 students	0	1	0.67	0.47
Large enrollment	S0101, 1=1201-1800 students	0	1	0.05	0.21
Extra large enrollment	S0101, 1 ≥1801 students	0	1	0.02	0.14
Elementary level	SCHLEVE2, 1=Elementary	0	1	0.59	0.49
Percent of students eligible for FRPL	S0284, S0101	0	100	41.18	28.42
Percent of minority students	MINENR	0	100	31.80	32.57
Student/teacher ratio	STU_TCH	1.58	745.60	15.62	12.77
School met district or state goals	PRFMET	0	1	0.60	0.49
Principal Background					
Female	A0227, 1=Female	0	1	0.43	0.49
Asian	RACETH_P, 1=Asian	0	1	0.01	0.09
African American	RACETH_P, 1=African American	0	1	0.11	0.31
Hispanic	RACETH_P, 1=Hispanic	0	1	0.05	0.22
Degree beyond Master's degree	A0225	0	1	0.44	0.50
Years of principal experience	PRNEXPER	0	67	8.94	7.73
Years of teaching experience	TCHEXPER	0	42	14.00	7.23

Principal perception of leadership. Previous literature on leadership styles guided the selection of principal perception of leadership variables. Similar to the teacher perception variables utilized, two main groups of variables represent principal perception of leadership. First, principals responded to items about their own leadership. Second, principals responded to items about teacher leadership. For principal perception of principal leadership, eleven dichotomous items are included. In addition, two continuous items are used, *principal perception of social disorder* and *percent of faculty teaching to high standards*. For principal perceptions of teacher leadership, seven items of principal perceptions about teacher leadership is on a five-choice Likert scale.

Principal perception of principal leadership. Principals responded to survey items about the frequency of their behaviors, which align with the descriptions of transactional leadership, transformational leadership and instructional leadership in previous literature. For transactional leadership, principals responded to item about the frequency that they *maintain physical security*, *manage school facilities*, *supervise staff*, *attend district meetings* either seldom, 0 = never to once or twice a month, or frequently, 1 = once or twice a week to daily (Bass, 1985; Firestone & Wilson, 1985). In addition, principals rated the degree of social disorder from 0 = not a problem to 4 = serious problem. A composite of the degree of social disorder, α = 0.85, was created by calculating the mean response that *student tardiness*, *student absenteeism*, *class cutting*, *physical conflicts*, *theft*, *vandalism*, *alcohol use*, *drug abuse*, *weapons*, and *disrespect for teachers* are a problem in the school (Griffith, 1999). Also as a continuous measure, principals provided the *percentage of teachers teaching to high standards* (Kennedy, 2006).

Next, transformational leadership is measured by the frequency that they *attend professional development with teachers,* 0 = never to twice and 1 = three to six or more times, *develop public relations*, *facilitate achievement of school mission*, *build professional community*, *provide professional development activities* as either seldom, 0 = never to once or twice a month, or frequently, 1 = once or twice a week to daily (Bass & Avolio, 1993; Bogler, 2001; Geijsel, Sleegers, Leithwood & Jantzi, 2003; Hallinger, 2003; Leithwood *et al*., 1998; Nguni, Sleegers & Denessen, 2006; Thoonen *et al*., 2011). Finally, the frequency that principals *guide development of curriculum* and *facilitate student learning* as either seldom, 0 = never to once or twice a month, or frequently, 1 = once or twice a week to daily, describes a principal's instructional leadership (Cuban, 1984; Edmonds, 1979; Hallinger, 2003, 2005) (*see table 5*).

Table 5. Descriptives for principal perceptions of principal leadership

Variable	1999-2000 SASS Variable	Min	Max	Mean	SD
Transactional Leadership					
Percent of teachers teaching to high academic standards	A0173	0	100	80.40	18.05
Principal perception of social disorder	Mean of A0130-1, 133-6, 138-141, α=.85	0	2.80	0.70	0.44
Maintain physical security	A0204	0	1	0.95	0.22
Manage school facilities	A0205	0	1	0.95	0.22
Supervise staff	A0198	0	1	0.84	0.37
Attend district meetings	A0206	0	1	0.56	0.50
Transformational Leadership					
Attend prof dev with teachers	A0163	0	1	0.91	0.29
Develop public relations	A0203	0	1	0.76	0.43
Facilitate achvmnt of school mission	A0197	0	1	0.72	0.45
Build professional community	A0202	0	1	0.68	0.47
Provide prof dev activities	A0201	0	1	0.38	0.49
Instructional Leadership					
Guide development of curriculum	A0199	0	1	0.65	0.48
Facilitate student learning	A0200	0	1	0.83	0.38

Principal perception of teacher leadership. Principals responded to survey items about the degree of influence, 0 = no influence to 4 = a great deal of influence, teachers were given over transactional and instructional leadership. The degree of influence shared with teachers for transactional leadership tasks included *evaluating teachers in this school*, *hiring teachers*, *deciding how the budget will be spent* and *setting discipline policy for the school* (Bridges, 1967; Smylie & Brownlee-Conyers, 1992; Weiss, 1993). Principals rated the degree of influence that they shared with teachers on instructional leadership tasks such as *performance standards for students in the school*, *curriculum at school*, and *the content of in-service professional development programs for teachers in school* (Hallinger, 2003, 2005; Harris, 2004; Marks & Printy, 2003; Printy, Marks & Bowers, 2009; Spillane, Halverson & Diamond, 2004) (*see table 6*).

Table 6. Descriptives for principal perceptions of teacher leadership

Variable	*1999-2000 SASS Variable*	*Min*	*Max*	*Mean*	*SD*
Transactional Leadership					
Evaluation of teachers	A0105	0	4	2.02	1.25
Hiring of teachers	A0112	0	4	2.32	1.24
Spending	A0127	0	4	2.55	1.08
Discipline policy	A0119	0	4	3.28	0.84
Instructional Leadership					
Performance standards	A0081	0	4	3.04	0.95
Curriculum	A0089	0	4	3.07	0.93
Prof dev program for teachers	A0097	0	4	3.08	0.90

Teacher Attrition Measures

Teacher attrition variables represent both broad and leaver specific categories. Broadly, the main dependent variable (ATTRIT) identifies teachers as *stayers, movers* and *leavers*. Principals of teachers included in 1999-2000 SASS provided information the following year on whether or not the teachers stayed at the school, moved schools, or left teaching. Principals who did not respond, did not know a teacher's status, or responded that the teacher was deceased or moved out of the country were counted as missing data which slightly reduced the sample size by less than one percent (*see table 7*).

Table 7. Descriptives for Stayers, Movers and Leavers

Variable Categories	1999-2000 SASS Variable	Count	%
Stayers	ATTRIT	30260	85%
Movers		2500	7%
Leavers		2740	8%
	n =	35510	100%

Note: Counts have been rounded to the nearest ten.

Additional information about a teacher's subsequent occupational status helps to identify which teachers retired or decided to leave the profession. To better describe the teachers who left, three categories were created, *occupational leavers* (pre-retirement, no longer working in schools or education), *necessity leavers* (retirement, disability, or taking care of family member), and *position leavers* (still working in schools not as a teacher or returned to school) from the 2000-2001 Teacher Follow up Survey of former teachers (Ingersoll, 2001) (*see table 8*).

Table 8. Descriptives for Position, Occupation and Necessity Leavers from 2000-2001 Teacher Follow up Survey (TFS)

Variable Categories	2000-2001 TFS Variable	Count	%
Position Leavers	F0053: 1,2,4=1	540	38%
Occupation Leavers	F0053: 3,8,9=2	230	16%
Necessity Leavers	F0053: 5,6,7=3	640	45%
	n =	1410	100%

Note: Counts have been rounded to the nearest ten.

The teacher and principal perception of leadership variables provide a description of the leadership behaviors within a school, which are used to define the different types of teachers and principals. The teacher, school and principal characteristics included in the models help to

account for context as well as demonstrate the demographics and backgrounds that most likely identify these different types of teachers and principals. Once teachers and principals are assigned into types, these subgroup categories of different types of teachers, in a school with a particular type of principal, help to predict their likelihood for leaving the profession. The following section outlines how these variables are used in the analyses.

Analytical Models

Three sequential latent class analyses address the three main research questions. First, latent class analysis is applied to principal perceptions of leadership styles to identify different types of principals while controlling for school and principal characteristics. Second, multilevel latent class analysis is applied to the teacher perceptions of leadership styles to identify different types of teachers while accounting for teacher as well as school and principal characteristics. Third, a multilevel latent class analysis which simultaneously includes both principal and teacher perceptions of leadership is used while accounting for principal and school characteristics mediated through principal types on teacher types with teacher background as controls. In each of the models, the teacher and principal perception of leadership variables, listed in the above section (*Tables 2, 3, 5, 6*), were theoretically grouped according to previous literature into transactional, transformational or instructional leadership styles. This system of organization helped to simplify discussion of the models, interpretation of findings and to establish links back to previous studies. After each latent class model is described, the final section of this chapter explains the data analysis process.

Principal latent class analysis: What are the different *types of principals* in school leadership across the U.S. and to what extent do these principal types predict teacher attrition?

To answer this first main research question, principal perceptions of principal leadership and teacher leadership are used as indicators of the latent class analysis (*see figure 5*). The model simultaneously controls for school and principal characteristics. In a final step, the assigned principal types are used as predictors in a multinomial logistic regression on teacher attrition categories, a distal outcome.
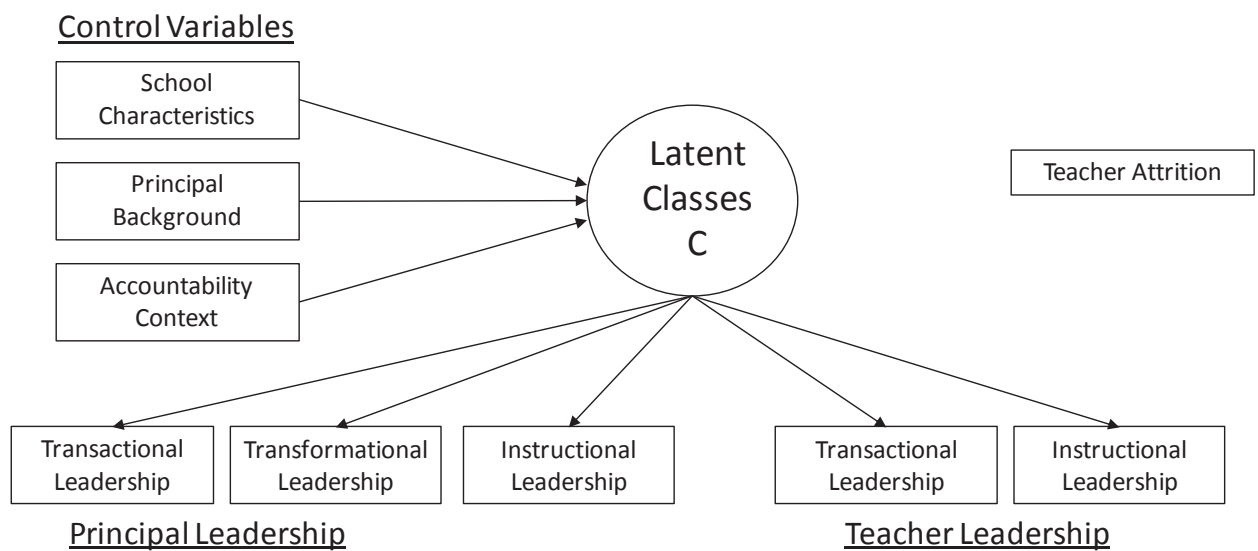
Figure 5. Principal latent class analysis

Two-level teacher latent class analysis: What are the different *types of teachers* in school leadership across the U.S. and to what extent do these teacher types predict teacher attrition?

To answer this second main research question, different types of teachers are identified based on teacher perceptions of the principal leadership and teacher leadership while controlling for school, principal and teacher characteristics (*see figure 6*). Next, each teacher type is used as a predictor of teacher attrition, a distal outcome, in a multinomial logistic regression.
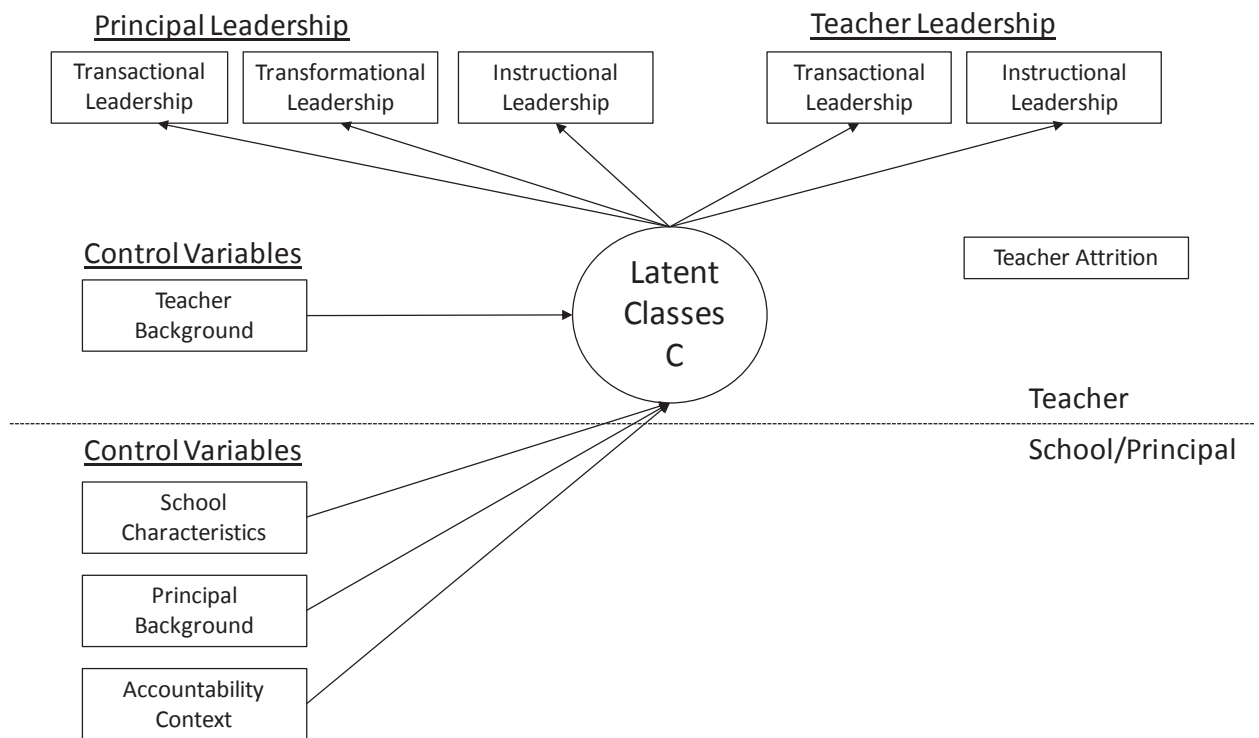
Figure 6. Two-level teacher latent class analysis

Two-level principal and teacher latent class analysis: In what ways do *principal and teacher*
***types* adjust when accounting for the interaction between principal and teacher perceptions**
and to what extent does the identification of a teacher type in a school with a principal type
predict teacher attrition?

To answer this third and final research question, this two-level latent class analysis combines the previous models into a single multilevel, omnibus model (*see figure 7*). This multilevel analysis tests the extent to which different types of principals based on principal perception predict different types of teachers based on teacher perception of leadership styles (represented by the arrow from principal latent class to teacher latent class). In addition, the different types of principals now vary by their types of teachers, which accounts for the dependent, or two way relationship, between principal and teachers. This interaction among principal and teacher perception of leadership is modeled with random intercepts and thresholds (represented by the solid circles) for each survey indicator in the principal leadership and teacher leadership items. The random intercepts and thresholds allow the principal types, principal perception, to vary by the teacher types, teacher perception. These new types based on the correct account of the nested nature of the data are then used to predict the different categories of teacher attrition.
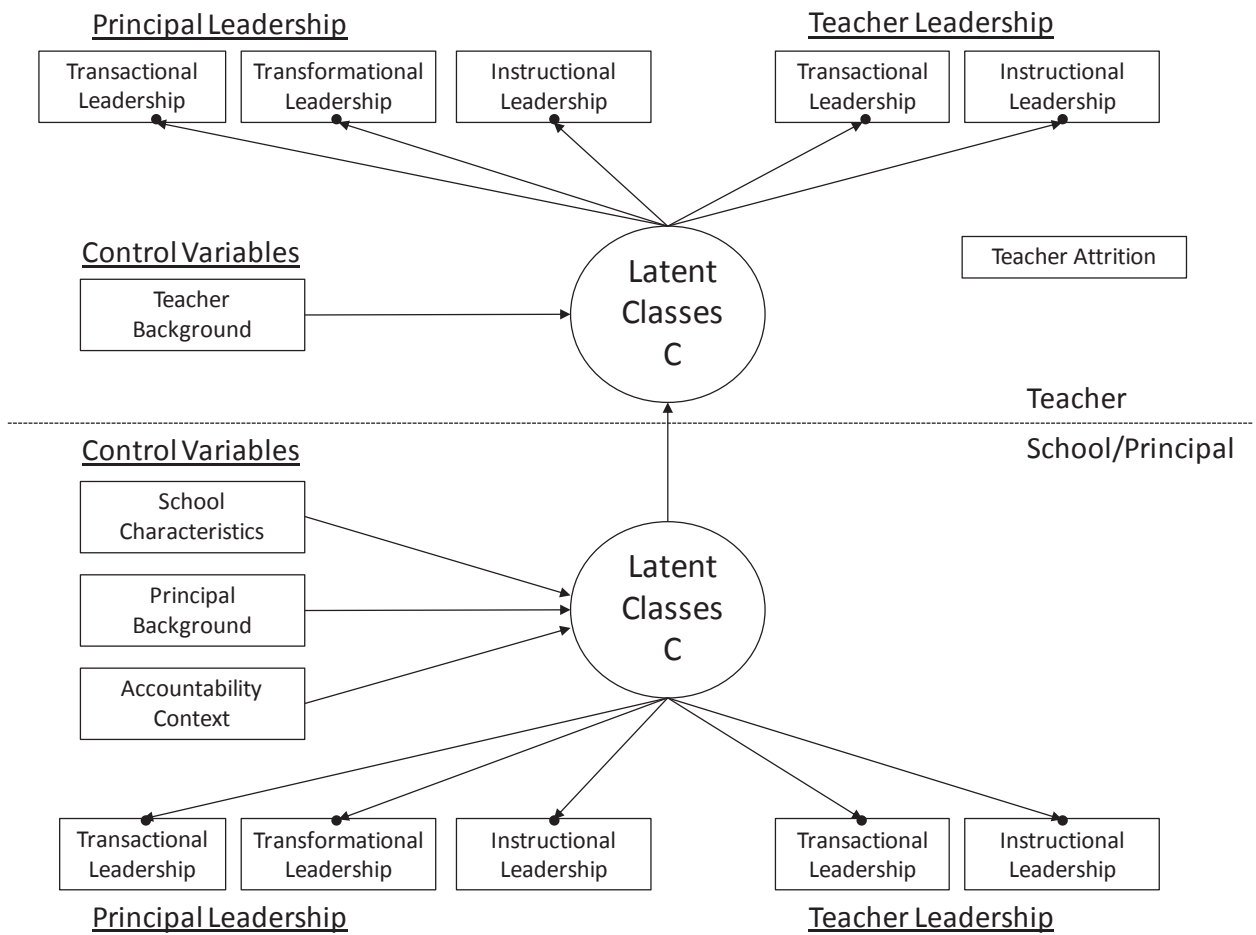
Figure 7. Two-level principal and teacher latent class analysis

Data Analysis

Mplus version 6 was used to estimate the latent class analysis (LCA) models using Robust Maximum Likelihood (MLR) estimation (Muthén & Muthén, 1998-2010). The dependent variables that define the different subgroups, or "latent classes", are grouped into two main conceptual categories: principal perception of principal leadership – transactional leadership, transformational leadership, instructional leadership – and principal perception of teacher leadership – transactional leadership and instructional leadership. Control variables include teacher, school and principal context and background variables, as well as the

accountability context, *school met district or state goals* (*see Figures 5-7 for models, refer to Tables 1-6 for variables*). In addition to accounting for the nested nature of the data with the use of multilevel data, teachers in schools, in the latent class analysis, sampling weights (SFNLWGT, TFNLWGT) were applied to correct for the non-random sample for representation of the entire U.S. population of school principals and teachers in 1999-2000.

Three separate analyses produce the main findings of this study. First, the principal latent class analysis is a single level LCA with both continuous (y) and dichotomous (u) survey indicators as outcomes of principal latent classes (C) on school and principal background variables (x) (*see appendix A for Mplus input*). Second, two-level teacher latent class analysis is a multilevel LCA with one set of latent classes (C) on teacher background (x), at the teacher level, and school and principal characteristics (w), at the school level (*see appendix B for Mplus input*). Third, two-level principal and teacher latent class analysis has two sets of latent classes, principal types and teacher types. Principal types (CB), defined by principal perception (ub, yb), are directly influenced by school and principal characteristic (w). Teacher types (CW), defined by teacher perception (uw, yw), are directly influenced by teacher background (x). However, a direct relationship between teacher types and principal types is also modeled by CW on CB, as a result school and principal characteristics indirectly influence teacher types and the extent of the relationship between principal types and teacher types is modeled. Further, the intercepts and thresholds of all dependent variables (ub, yb, uw, yw) of CB and CW are allowed to vary, rather than fixed or constant across respondents and classes. This creates a cross-level interaction among teacher and principal perception (ub, yb, uw, yw) which potentially adjusts the ways in which these perceptions describe and define the principal and teacher latent classes in order to

account for the two-way relationship between principals and teachers (CB, CW) (*see appendix C for Mplus input*).

For the principal LCA and the two-level teacher only LCA, an iterative set of models are tested (Nylund *et al.*, 2007; Jung & Wickrama, 2008) in which the first model is a two group model, and then subsequent models are fit to the data, and model fit is assessed using a k-1 hypothesis test (e.g. two class model compared to one class model), the Lo-Mendell-Rubin (LMR) (Lo, Mendel & Rubin, 2001; Lo, 2005), along with negative loglikelihood, Akaike Information Criteria (AIC), and Bayesian Information Criteria (BIC). Model testing then proceeds iteratively with k+1 latent classes until the model does not have significant LMR, at which point the statistically significant k-1 model with the most latent classes and low BIC and AIC is interpreted (Nylund *et al.*, 2007; Jung & Wickrama, 2008). For example, if the four class model is no longer significantly different from the three class model, then the three class model is interpreted.

The model fit from the principal only and teacher only LCAs pre-determined the number of teacher classes and principal classes tested in the final two-level LCA of both teacher and principals. Since two latent classes, principal and teacher at level 1 and 2 of the model, are specified in the same analysis, a likelihood ratio test, such as the LMR, cannot be calculated. These simultaneous latent classes have dependent, nested data, so an accurate hypothesis test of an iteration to a k-1 iteration is not yet possible (Muthén, 2012). Because of this limitation for the LMR as well as the accuracy of the BIC and AIC, the results of the model should have interpretability (Muthén, 2012). In this study, the purpose of this final model is to better understand the ways in which the similarities of perceptions within the types of teachers and principals and differences in perceptions across the types change when using the same variables

and set number of classes but including an interaction between teacher and principal perceptions. In other words, a comparison of the results for this final model to principal types from the principal only model, and to the teacher types from the teacher only model, demonstrates the ways in which changes in the types are attributed to the cross-level, two-way interaction between principals and teachers. The principal perception only model and teacher perception only model aid in the interpretability of this final model with both perceptions included.

After the results of the LCA yield the most likely class membership for each teacher or principal, these class assignments are used as grouping variables to investigate the differences between each subgroup. I analyzed whether or not responses to each leadership item is statistically different across each class using one-way analysis of variance for continuous variables and chi square for dichotomous variables. Post hoc tests, Tukey b and z-test with Bonferroni adjustments to p-values, are utilized to identify the homogenous subsets of means or frequencies across classes so that each significantly different group response is identified with its own subscript letter in ascending order (Schüz *et al*., 2009). Post hoc tests demonstrate the significant high, mid and low responses for each leadership item. In addition, the mean responses are incorporated into a line plot to visualize the differences between the classes.

For only principal types, a separate plot of the relationship between transformational leadership and shared instructional leadership is created in order to compare the results of the principal types to past literature on leadership styles (Marks & Printy, 2003). First, a composite of transformational leadership was computed with the mean of principal perception of principal transformational leadership. Second, a composite of shared instructional leadership was computed with the mean of principal perception of principal instructional leadership and principal perception of teacher instructional leadership. Third, both of these composites were z-

scored and plotted on an x-y graph. The plot of the relationship between transformational and shared instructional leadership for the principal types from the principal only model and the principal types from the two-level principal and teacher model allow for the replication and extension of findings from Marks and Printy (2003) with a nationally representative sample.

For all three models, odds ratios are reported for the influence of background variables on each principal and teacher types as well as the influence of each type on teacher attrition categories. The multinomial logistic regression of background variables on types was analyzed within the omnibus latent class analysis model in *Mplus*. Further, in the final two-level model with both teacher and principal types, the relationship between teacher latent classes and principal latent classes was also tested as a multinomial logistic regression in the omnibus model in *Mplus*. Finally, the influence of these principal and teacher types on teacher attrition, the distal outcome, was tested in SPSS using a multinomial logistic regression with sample weights applied.

CHAPTER FOUR: RESULTS

Introduction to Results

This chapter is divided into three main sections which are structured to detail the findings from each of the three sequential latent class analyses which answer the main research questions. Each type or class resulting from the latent class analysis has been named based on the perceptions and characteristics that distinguish that class from the other classes. Across models, principal types and teacher types are assigned similar names to reflect the congruency of their perceptions and characteristics (e.g. *Integrated* teachers and *Integrating* principals). However, all principal type names end in *–ing*, as the director of the action, and all teacher type names end in *–ed*, as the receiver of the action.

First, the findings from the principal latent class analysis of principal perception of leadership only are presented, which answers the first main research question. The principal latent class analysis has five sets of results: principal class membership, a description of the ways in which each principal type responded to the leadership items, a replication and extension of the relationship between transformational and shared instructional leadership for each principal type based on Mark & Printy (2003), the extent of the influence of principal and school background on principal types, and the extent that principal types predict teacher attrition.

In sum, the results of this model show that there are three different types of principals, *Integrating*, *Controlling*, and *Balkanizing*. *Integrating* principals reported frequent principal leadership and a greater degree of leadership shared with the teachers. *Controlling* principals perceived themselves as having frequent principal leadership, but limiting the amount of leadership provided to the teachers. In contrast, *Balkanizing* principals reported limited principal leadership and higher teacher leadership. Only *Integrating* principals demonstrated a high,

positive relationship between transformational and shared instructional leadership. Further, compared to *Balkanizing* principals best defined by the departmentalization of secondary schools, *Integrating* principals were more often in schools that met state and district accountability goals. Finally, teachers with *Controlling* principals were more likely to leave their teaching position.

Second, the results of the two-level teacher latent class analysis of teacher perception of leadership only are discussed, which answers the second main research question of this study. The two-level teacher latent class analysis has four sets of findings: teacher class membership, a description of the ways in which each teacher type responded to the leadership items, the extent of the influence of teacher background as well as school and principal characteristics on teacher types, and the extent that these teacher types predict teacher attrition.

In sum, there were four different types of teachers, *Integrated*, *Transitioned*, *Balkanized*, and *Limited*. There were two teacher types whose responses did not reflect the previous principal types from the principal only model. *Limited* teachers responded that there was limited principal and teacher leadership within their school. *Transitioned* teachers followed a similar pattern as *Integrated* teachers, but reported mid-level of teacher leadership. This perhaps suggests that *Transitioned* teachers experience school leadership that is in transition either to more shared instructional or represents a reduction in shared instructional leadership. *Integrated* and *Transitioned* teachers reported a relatively high frequency of principal leadership. *Balkanized* and *Limited* teachers reported a relative low frequency of principal leadership. For teacher perception of teacher leadership, *Integrated* teacher responses remained high and *Limited* remained low. *Balkanized* and *Transitioned* teachers responded that they received a mid-degree of teacher leadership with *Balkanized* teachers reporting a relatively higher amount of classroom

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autonomy. With school and principal background as a direct control, teacher background variables best predicted the *Integrated* teachers. However, school and principal characteristics influenced all teacher types. Finally, *Integrated* teachers were less likely to leave the profession or move schools.

Third, the results of the final two-level latent class analysis of teachers and principals are presented, which answer the third main research question of this study. When including the cross-level interaction between the principal and teacher perception of leadership items, only the principal types significantly changed. The teacher types found in the previous model remained the same when these interactions were included. In addition to the use of the cross-level interactions between principal and teacher leadership perceptions, for this model, the school and principal background variables were included as only an indirect influence on teacher types through principal types. While the teacher types remained the same, the relationship between teacher types and teacher background variables changed since school and principal background were indirect controls.

The findings of this two-level latent class analysis that includes both principal and teacher perceptions has six sets of results: principal and teacher class membership, a description of the ways in which the perception of leadership for each principal type changed when including the cross-level interaction between principal and teacher perception, a replication and extension of the relationship between transformational and shared instructional leadership (Marks & Printy, 2003) using the new principal types, the extent of the influence of teacher background on teacher types when indirectly controlling for school and principal background as well as the extent of influence of school and principal characteristics on the new principal types, a description of the extent that teacher types group within principal types, and finally, the extent

that the new principal types and teacher types in a school with a particular principal type predict teacher attrition.

In sum, the results of this final model show that the interaction between principal and teacher perception adjusted the principal types rather than the teacher types. Further, the teacher types explained the variance in principal perception of teacher leadership, which shows that the degree of influence that the principal shares with teachers varies by teacher rather than at the school level. Because of this *Controlling* principals were no longer a type, the three principal types from this model with the interaction between teacher and principal perception were *Integrating*, *Transitioning*, and *Balkanizing*. When plotting the relationship between transformational and shared instructional leadership (Marks & Printy, 2003) for these new principal types, both *Transitioning* and *Integrating* principals had a relatively high degree of shared instructional leadership, but there was an increased amount of error or variance in the degree of instructional leadership shared between teachers and principals, which show that teacher leadership varies at the teacher level. *Integrating* principals had a high, positive relationship between transformational and shared instructional leadership. Teacher background characteristics helped to predict teacher types and school and principal background helped to predict principal types in this model. Interestingly, *Integrated* teachers, high responders, and *Limited* teachers, low responders, were evenly distributed across all principal types. However, *Integrated* teachers with *Integrating* principals were less likely to move schools the following year.

Principal Latent Class Analysis

The results of this principal latent class analysis answers the research question: **What are the different *types of principals* in school leadership across the U.S. and to what extent do**

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these principal types predict teacher attrition? This model uses principal perception of

principal and teacher leadership to define different types of principals while controlling for

school and principal background variables (*refer to Figure 5 in methods*). To connect to previous

literature, the relationship between transformational and shared instructional leadership is plotted

for each principal type to confirm and extend the findings of Marks and Printy (2003). Finally,

each of these principal types is used as a predictor of teacher attrition.

Principal Class Membership

Following the recommendations of the mixture modeling literature (Jung & Wickrama,

2008), I tested an iterative set of LCA models (*see Table 9*). The four-class model did not

significantly fit the data (p=0.45). The three-class model fit the data well, p<0.001, with an

entropy of 0.79, AIC = 283854.15, BIC = 284578.37, and LMR= 4692.10. Consequently, as the

first study to date to examine the prevalence of different types of principals using a large

nationally representative sample, my results show that schools in the 1999-2000 academic year

had three significantly different types of principals based on their perceptions of their own

leadership style in the school and their perceptions of teacher leadership in their school,

controlling for background and context variables.

Table 9. Principal latent class analysis: Results and fit indices

Principal Classes	Entropy	AIC	BIC	-Loglikelihood (-LL)	% Decrease in -LL	Lo-Mendell-Rubin Test for k-1 classes	p-value
Two-class	0.76	288489.78	288951.90	144177.89	----	9245.30	< 0.001
Three-class	0.79	283854.15	284578.37	141822.07	1.63	4692.10	< 0.001
Four-class	0.76	282052.65	283038.98	140883.32	2.29	1869.71	0.45

After reviewing the differences in principal responses to the survey items and the background, context and control variables for each subgroup discussed below, I labeled the three types of principals as *Controlling, Balkanizing* or *Integrating* to describe the different types of leadership that these principals saw themselves as providing their schools. The majority of the sample (54%) was identified as an *Integrating* principal. The remaining portion of the sample was split between the *Controlling* (24%) and *Balkanizing* (22%) subgroups (*see table 10*). The probability of the most likely latent class membership ranged from just under to over 90%, which demonstrates appropriate classification (*see table 11*). Around 90% of principals were assigned to their most likely latent class. Some principals may partially fit in more than one group which leads to some misspecification. Overall, the LCA indicated significant differences in the patterns of how the different subgroups of the principals responded to questions about their perceptions of their leadership styles and their perceptions of leadership shared with teachers. I named the groups based on these differences across the responses.

Table 10. Principal latent class analysis: Most likely class membership

Principal Class	Class Count
1 *(Controlling)*	1760 (24%)
2 *(Balkanizing)*	1620 (22%)
3 *(Integrating)*	3940 (54%)

Note: Counts have been rounded to the nearest ten.

Table 11. Principal latent class analysis: Class probabilities for most likely latent class membership (row) by latent class (column)

Latent Class	1(C)	2 (B)	3 (I)
1 (C)	.89	.05	.06
2 (B)	.05	.87	.08
3 (I)	.03	.05	.92

Note: 1(C) = *Controlling*, 2(B) = *Balkanizing*, 3(I) = *Integrating*.

Principal Perception of Leadership by Type

Figure 8 and Figure 9 disaggregate the responses of the principals to the survey items by each of the three subgroups (*refer to appendices D and E for ANVOA and chi square of each item*). In Figure 8, differences across the survey items by each of the three groups in the principal's perception of their leadership are presented. The *Integrating* subgroup had the highest principal responses to the frequency of how often they practiced transactional, transformational and instructional leadership. In comparison, the *Controlling* principals' perceptions of how often they practiced each of the leadership domains were between the *Integrating* and *Balkanizing*. The *Balkanizing* principals had a somewhat different pattern to their responses, responding that they practiced transactional, transformational and instructional leadership tasks less of the time than the *Integrating* and *Balkanizing* principals. Less than half of the *Balkanizing* principals responded that they practiced transformational and instructional leadership behaviors at least weekly.

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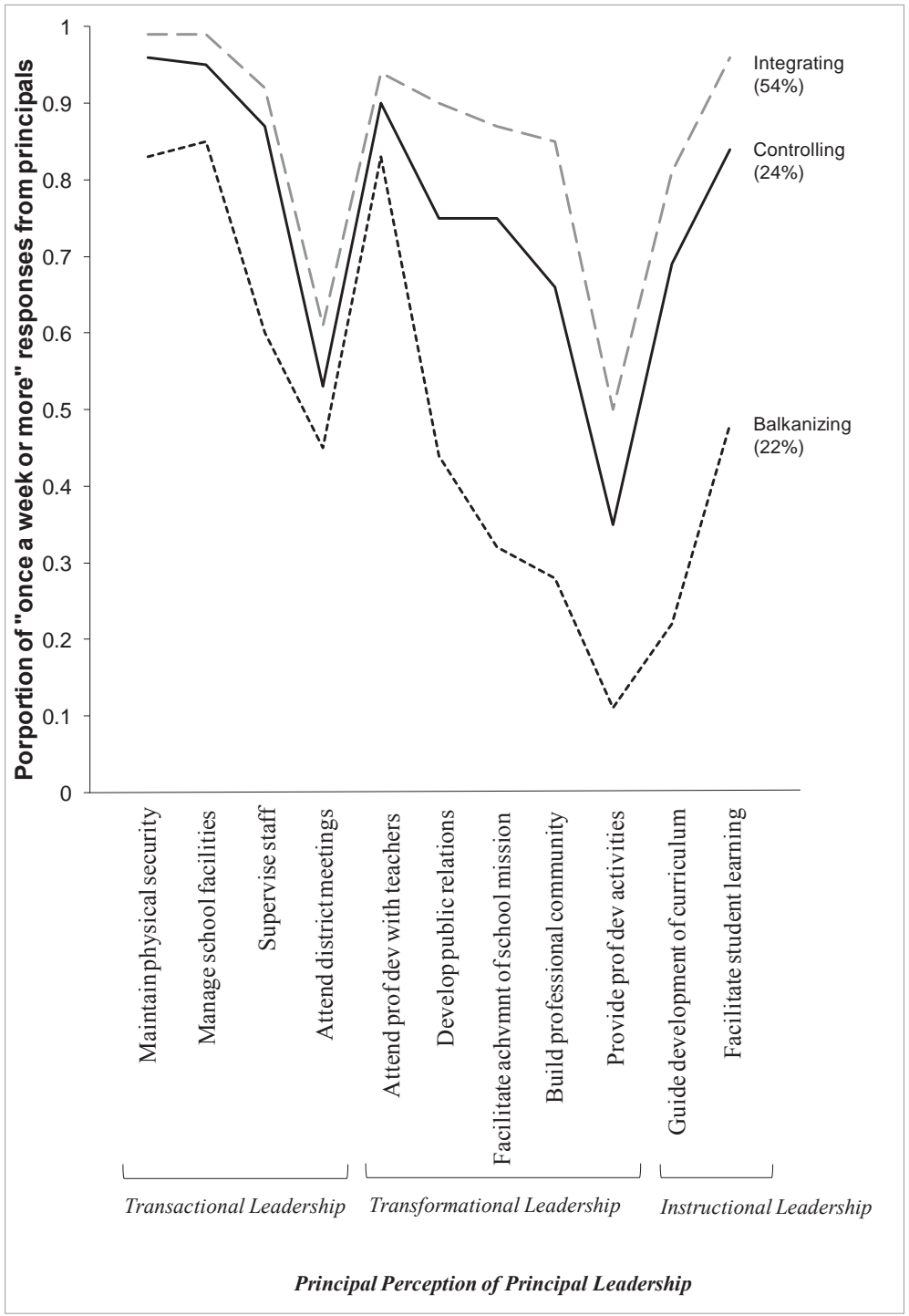
Figure 8. Line graph of the proportion of principals in each type who responded that they perform transactional, transformational and instructional leadership tasks at least once a week or mor
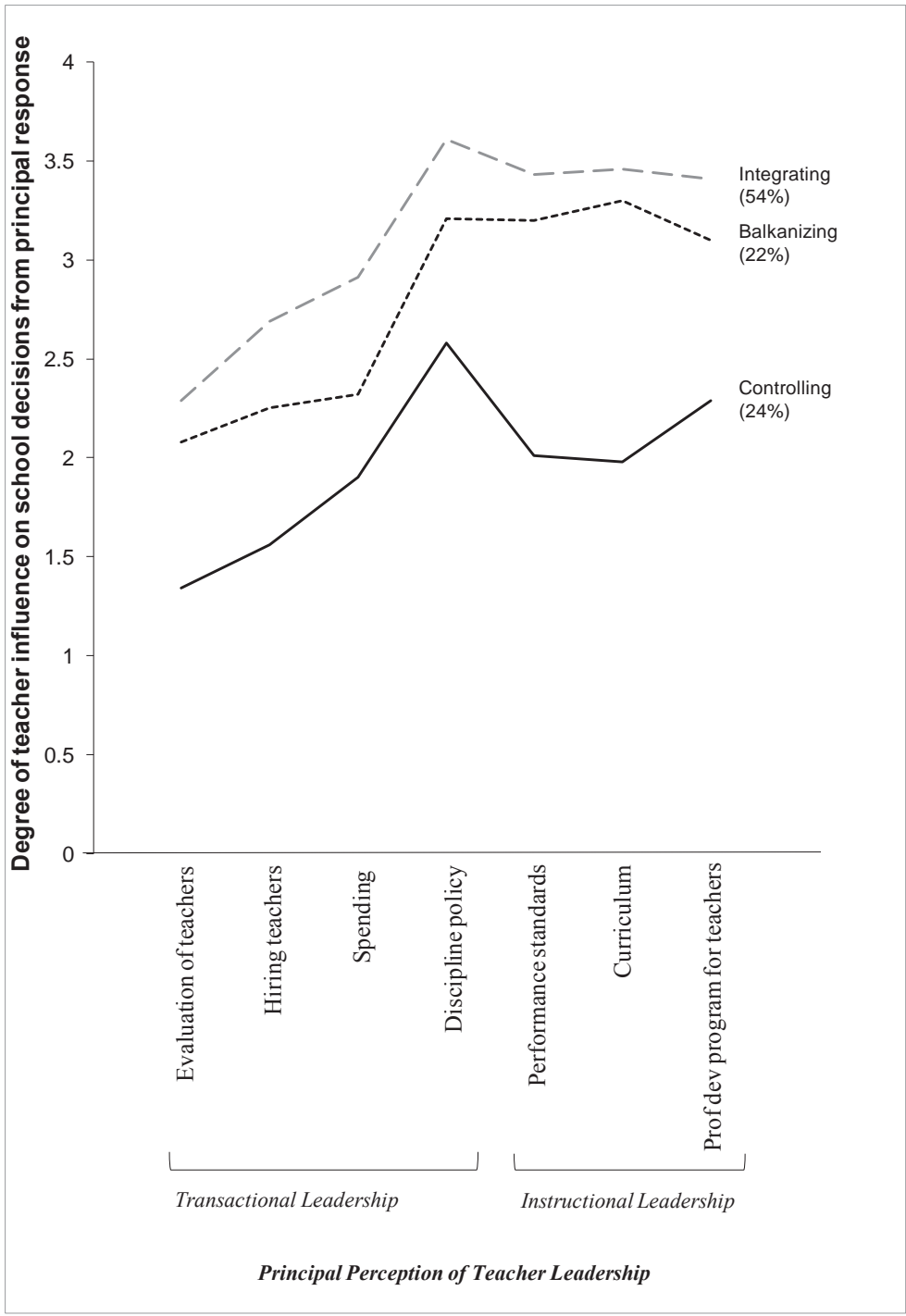
Figure 9. Line graph of the mean response of the degree to which the principals in each type perceive that they share transactional and instructional leadership tasks with teachers.

Figure 9 presents the responses across the three groups to the survey items that measured principal perception of shared leadership with teachers. Again, the *Integrating* subgroup of principals responded that teachers had the highest levels of influence on school decisions in both transactional and instructional leadership. However, in comparison to Figure 8 which examined the principal's perception of their own leadership, Figure 9 shows the opposite pattern from Figure 8 in the *Balkanizing* and *Controlling* principal's responses to the amount of leadership that they perceive that teachers have influence over in their schools in both transactional and instructional leadership. Here in Figure 9, the *Balkanizing* subgroup lies between *Integrating* and *Controlling* (the opposite of Figure 8), indicating that when it comes to the degree of influence that the principals share with teachers, the subgroup that I have termed as *Balkanizing* had fairly high responses to the amount of teacher influence over leadership in their schools, while the *Controlling* group saw teachers in their schools as having the lowest levels of influence, especially when it came to influence over instructional leadership issues such as performance standards, curriculum and professional development (*see Figure 9*).

In addition, the typology varied across the principal's responses to percent of teachers teaching to high academic standards ($F = 181.71, p < 0.001$) with *Integrating* principals reporting that 84% (SD = 15.66) of their teachers teach to high academic standards, in comparison with 78% (SD = 17.85) for *Balkanizing* and 75% (SD = 21.07) for *Controlling*. Finally, in examining the principal's perception of the amount of social disorder in the school, the three subgroups differed significantly ($F = 60.32, p < 0.001$). *Integrating* principals perceived the least amount of social disorder (M = 0.65, SD = 0.41) while *Balkanizing* (M = 0.77, SD = 0.47) and *Controlling* (M = 0.76, SD = 0.47) principals did not differ by social disorder (*see appendix D*).

In sum, *Integrating* principals reported more often weekly practice of transactional, transformational leadership and instructional leadership and the greatest degree of perceived teacher influence over transactional and instructional leadership. This dual attention to both their leadership practice and the shared leadership practices of teachers define the *Integrating* principal type. *Controlling* principals had somewhat lower reported frequencies of attending to transactional, transformational and instructional leadership behaviors, which were fairly close to the Integrating principal type. Yet, *Controlling* principals perceived their teachers as having the least amount of influence over managerial tasks and instructional leadership. This difference defines the *Controlling* group, in that the principals perceive that they practice leadership behaviors often themselves, but share the least amount of leadership in either transactional or instructional domains with their teachers.

In contrast to these two groups, fewer *Balkanizing* principals reported weekly practice of transactional, transformational and instructional leadership, yet reported a higher degree of teacher influence over transactional and instructional leadership compared to *Controlling* principals. *Balkanizing* principals appear to be the opposite of the *Controlling* principals. For the group that we termed *Balkanizing*, these principals have the lowest frequencies of attending to transformational and instructional leadership (although the differences between the three groups on managerial tasks is fairly small, *see Figure 8*), but compare favorably to the Integrating principals in the degree of influence that the principals report that teachers have on school decisions that relate to transactional and instructional issues.

Relationship between Transformational and Shared Instructional Leadership

In comparing the results with the past literature, such as Marks & Printy (2003), this difference across the subgroups is lying along two dimensions, transformational leadership and

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shared instructional leadership. While *Integrating*, *Balkanizing* and *Controlling* principal types are identified by the differing patterns across Figures 8 and 9 above, the past literature (Marks & Printy, 2003) has suggested that principals and schools may be simultaneously distributed along two dimensions of leadership, transformational leadership that focuses on principals engaging teachers in the organizational processes of the school, and shared instructional leadership, that focuses on principals distributing leadership tasks to teachers around issues with curriculum, instruction, pedagogy and professional development. Rather than describing principals and schools as either transformational or not, or shared instructional or not, Marks & Printy (2003) urged for the integration of these concepts. They viewed their sample of 24 restructured schools from 1994 as distributing across both dimensions on continuous scales. This demonstrated that for their sample, no schools with low transformational leadership had high shared instructional leadership (*see figure 10*). Rather, the schools distributed across all other quadrants, indicating that transformational leadership was necessary but insufficient for shared instructional leadership, at least in their limited sample of 24 restructured schools. The principal types found in this study present a unique opportunity to test if the Marks & Printy (2003) pattern holds in the large nationally generalizable SASS sample.

Thus, to help visualize the differences across the three groups and test the postulates, standardized mean scores of principal transformational leadership items and principal and teacher instructional leadership items were plotted for each type of principal in Figure 11. This figure synthesizes the information from Figures 8 and 9, by plotting the mean responses of each of the three subgroups using the mean across transformational leadership items from Figure 8 for the x-axis, and the mean across instructional leadership items from both Figures 8 and 9 for the y-axis in Figure 11.

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Of note, in replicating and extending the work of Marks & Printy (2003) to a large nationally generalizable sample, none of the centroids for any of the three subgroups fell within the upper left quadrant, providing substantial support for the hypothesis that transformational leadership is necessary but insufficient for shared instructional leadership. In other words, principals who are shared instructional leaders are also transformational leaders but not the reverse. Interestingly, from this model of principal perception only, the majority of principals, over 50%, across the U.S. were categorized as *Integrating* principals. This membership shifts and reduces to 35%, when accounting for both teacher and principal perception in the same model. Yet, this principal perception only model demonstrates that the majority of principals across the U.S. view themselves as providing high transformational and shared instructional leadership.
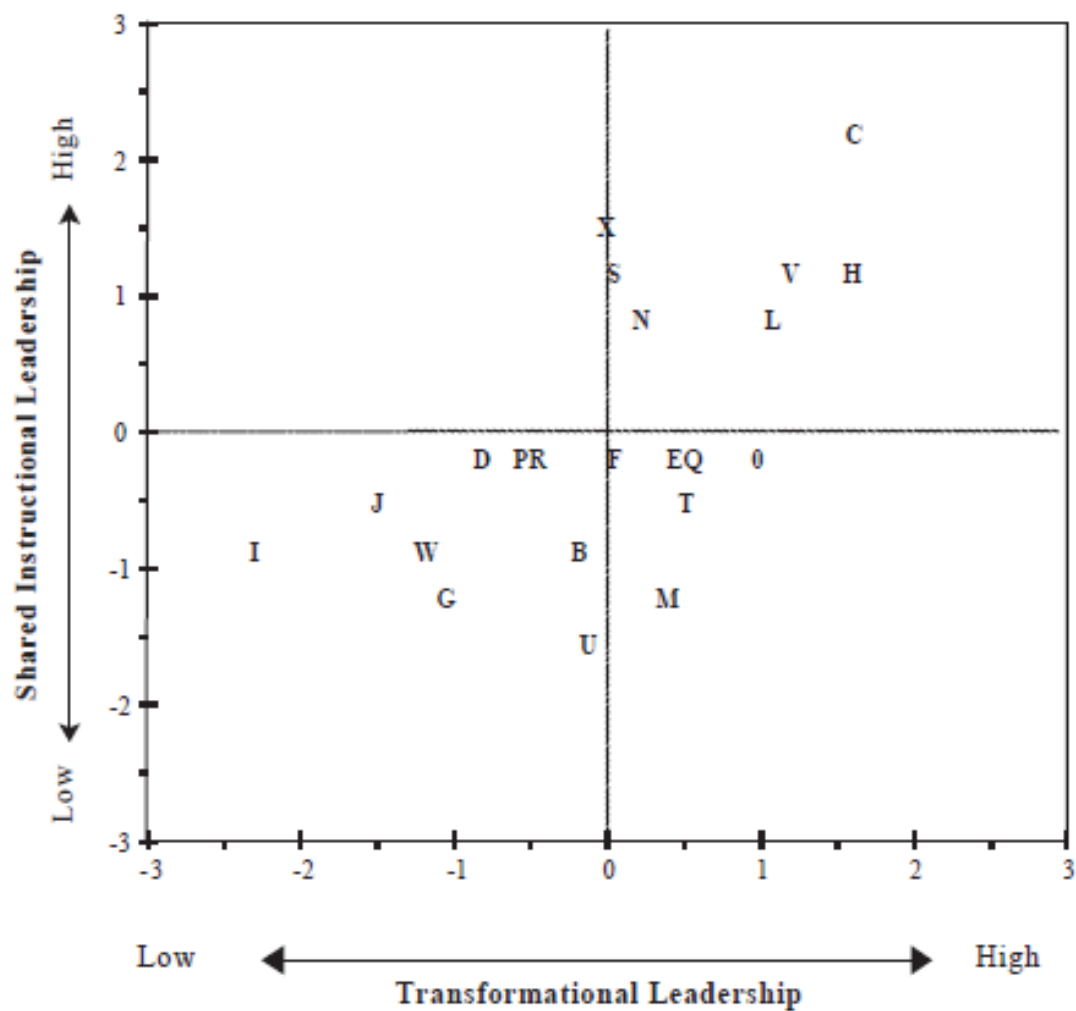
Figure 10. Reprint of Marks and Printy (2003) plot of the relationship between shared instructional and transformational leadership at 24 restructured schools in 1993.
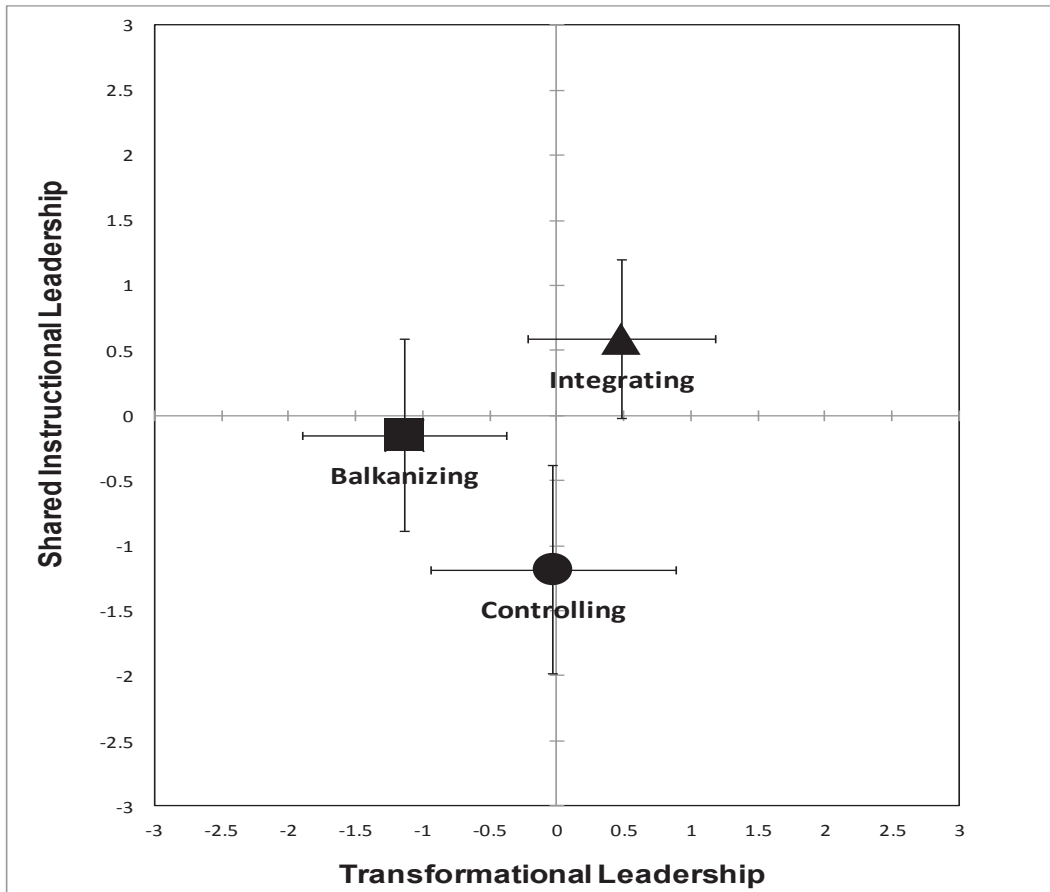
Figure 11. Relationship between transformational and shared instructional leadership by principal type with a nationally representative sample of schools.

In examining Figure 11, the centroid for *Integrating* principals in these two dimensions is in the upper right quadrant. These principals had high transformational leadership and high shared instructional leadership. Furthermore, the *Integrating* type had less variation in the practice of these styles of leadership compared to the other types. Most of the length of the error bars is contained in the upper right quadrant and around half of a standard deviation shorter compared to other types. This indicates that *Integrating* principals who perceived that they practiced both high transformational and high shared instructional leadership in their school had greater consistency in their responses compared to principals in the *Controlling* and *Balkanizing*

types. As noted above, the majority (54%) of the principals were *Integrating*. Given that this is

the first study to examine the prevalence of different types of principals as they relate to

transformational and shared instructional leadership using a large nationally representative

sample, these results indicate that the majority of principals in 1999-2000 reported that they

perceived their schools as being high in both dimensions.

The placement of *Controlling* and *Balkanizing* principals compared to *Integrating*

principals in this graph extend the findings of Marks and Printy (2003). For the first time, these

findings help to describe the types of principals with lower transformational and shared

instructional leadership based on principal perception. The centroid for *Controlling* principals

sits in the lower right quadrant with error bars extending across to the lower left quadrant. These

principals had a mid-range practice of transformational leadership with low shared instructional

leadership. Thus, the results suggest that these principals perceived that they were leading their

schools in transactional, transformational and instructional leadership domains (*see Figure 8*),

but that they were not distributing this leadership to their teachers (*see Figure 9*).

The centroid for *Balkanizing* principals is situated in the lower left quadrant of Figure 11,

which was low overall but somewhat between *Integrating* and *Controlling* in shared instructional

leadership, but the lowest in transformational leadership among the three types. These principals

were termed as "*Balkanizing*" since it appeared from their responses across the survey items that

they had the lowest perceptions of their own leadership (*see Figure 8*), but reported that teachers

had a high degree of influence over managerial and instructional tasks (*see Figure 9*). Thus, it

appears that these principals promoted a "*Balkanizing*" form of leadership, in which they ceded

leadership authority to teachers and teacher teams. Although this principal type ceded leadership

to the teachers, Marks and Printy (2003) would argue that centralized control is necessary for

effective forms of shared instructional leadership. These hypotheses about the nature of leadership for each principal type are supported by the significant background variables.

School and Principal Background as Predictors of Principal Types

In addition to the dependent variables in the LCA that help to define the three groups, LCA allows for multiple control variables on the probability that a principal is in each of the three groups using multinomial logistic regression in the omnibus model. Table 12 presents the results from this part of the model, and shows that the three subgroups varied significantly across many of the background variables. Because the *Balkanizing* subgroup had a mid-level response about the degree of leadership and was also found in the final model, this type was used as the reference group across models for consistency in interpretations.

The odds ratios presented in Table 12 describe the likelihood of a principal or school with particular characteristics to be in either the *Controlling* or *Integrating* group in comparison to *Balkanizing*. Compared to *Balkanizing* principals, *Controlling* principals were less often in rural schools, small enrollment schools and Asian principals. However, *Controlling* principals more often had an increased percentage of minority students. Similarly, *Integrating* principals less often were in schools in rural areas, with small enrollments, and were less often Asian principals. In contrast, *Integrating* principals were more likely to lead elementary schools, have an increased number of minority students, more often met state and district goals and were more likely female. Based on these results, *Balkanizing* principals were more often in rural, small schools with a smaller percentage of minority students and more often Asian principals. Yet compared to *Integrating*, the high responders, *Balkanizing* principals were more often in secondary schools, less often met state and district goals and more often male. *Balkanizing* principals as leaders of secondary schools helps to explain why these principal perceived that they ceded most influence to teachers.

Table 12. Principal latent class analysis: Means and odds ratios for school characteristics and principal background variables with *Balkanizing* principals as the reference group

Variable	Controlling (24%)		Balkanizing (22%)		Integrating (54%)	
	Mean	*Odds Ratio*	*Mean*	*Odds Ratio*	*Mean*	*Odds Ratio*
School Demographics						
Urban	0.28	1.15	0.14	---	0.24	1.19
Rural	0.27	0.67 **	0.47	---	0.29	0.71**
Small enrollment	0.62	0.63 **	0.76	---	0.66	0.69**
Large enrollment	0.07	1.10	0.04	---	0.04	0.70
Extra large enrollment	0.02	0.68	0.02	---	0.02	0.74
Elementary level	0.58	1.19	0.50	---	0.63	1.34*
Percent of students eligible for FRPL	45.16	1.00	38.34	---	40.57	1.00
Percent of minority students	39.03	1.01 ***	22.10	---	32.57	1.01**
Student/teacher ratio	15.44	1.00	14.75	---	16.06	1.02
Accountability Context						
School met district or state goals	0.54	1.20	0.53	---	0.65	1.75***
Principal Background						
Female	0.41	1.09	0.30	---	0.49	1.75***
Asian	0.00	0.13 ***	0.01	---	0.01	0.34*
African American	0.16	0.70	0.06	---	0.10	1.05
Hispanic	0.05	0.96	0.04	---	0.06	0.96
Education beyond Master's degree	0.41	0.96	0.42	---	0.45	1.08
Years of experience as principal	8.28	0.99	9.39	---	9.05	1.00
Years of experience as teacher	14.21	1.00	13.93	---	13.94	1.00

Note: $*p \le 0.05$, $** p \le 0.01$, $***p \le 0.001$.

Principal Types and Teacher Attrition

Thus, these results demonstrate that the three subgroups of principals significantly differ across the survey items in both their perceptions of their leadership style and their perceptions of teacher leadership and also are defined by their background and school characteristics. Finally, to assess the relationship of each of the three subgroups on teacher attrition, I regressed each of the three types of principals on the different categories of teacher retention or attrition the following year. First, the relationship between the principal typology and stayers, movers and leavers was

analyzed using a post hoc multinomial logistic regression. Stayers were used as the reference group for the outcome categories since approximately 85% of teachers chose to stay in the teaching profession and at their current school the following year. Balkanizing principals remained as the reference group for the principal types.

Using ATTRIT as the outcome which includes the full sample of teachers, *Controlling* and *Integrating* principals compared to *Balkanizing* principals were more likely to have teachers leave the teaching profession as opposed to stay. In addition, *Integrating* compared to *Balkanizing* principals were more likely to have teachers move to a different school as opposed to staying at their current school (*see table 13*). These findings seem counterintuitive to the previous literature which suggests that a principal with more transformational and shared instructional leadership behaviors would encourage more teachers to remain in teaching profession and their school. However, when looking at the relationship between these principals and a narrowed sample of only teachers who left teaching, the results are more consistent with previous literature since *Controlling* principals were more likely to have teachers chose to leave their teaching position.

Table 13. Principal latent class analysis: Odds ratios from a multinomial logistic regression of the likelihood for *Controlling* and *Integrating* principals compared to *Balkanizing* principals to have teachers as Leavers or Movers compared to Stayers

Principal Class	Leavers (8%)		Movers (7%)	
Controlling (24%)	1.19	**	1.08	
Integrating (54%)	1.26	***	1.13	*

Note: *$p \leq 0.05$, ** $p \leq 0.01$, ***$p \leq 0.001$.

Using the 2000-2001 TFS data of $n = 1{,}410$ former teachers, I tested the relationship between principal types and teacher occupational status, occupation, position and necessity leavers (*see table 14*). Compared to *Balkanizing* principals, teachers with *Controlling* principals were over two times more likely to choose to leave their teaching positions but remained in education as opposed to those who left teaching out of necessity. There were no differences in the likelihood of teachers to leave education as an occupation across each of the principal groups. This shows that there were no differences between pre-retirement leavers and retirement leavers across the principal types. However, teachers with *Controlling* principals were more likely to leave their teaching position but remain in schools. This suggests that principals who view themselves as restricting teacher influence might be more likely to push teachers out of teaching positions. Next, I turn to the results for the second latent class analysis model of teachers.

Table 14. Principal latent class analysis: Odds ratios from a multinomial logistic regression of the likelihood for *Controlling* and *Integrating* principals compared to *Balkanizing* principals to have teachers as Position or Occupation leavers compared to Necessity leavers using 2000-2001 Teacher Follow up Survey (TFS), $n = 1430$

Principal Class	Position Leavers (38%)		Occupation Leavers (16%)
Controlling (24%)	2.18	***	1.18
Integrating (54%)	1.27		0.70

Note: *$p \leq 0.05$, ** $p \leq 0.01$, ***$p \leq 0.001$.

Two-level Teacher Latent Class Analysis

The results of this two-level teacher latent class analysis answers the research question:

What are the different *types of teachers* in school leadership across the U.S. and to what

extent do these teacher types predict teacher attrition? This model uses teacher perception of

principal and teacher leadership to define different types of teachers while controlling for teacher

background as well as school and principal characteristics (*refer to Figure 6 in methods*). The

results of this model show the differences in teacher perceptions of leadership across teacher

types. Specific to this LCA, school and principal characteristics in addition to teacher

background variables were direct controls on the teacher types. Lastly, teacher types were

regressed on categories of stayers, movers and leavers using ATTRIT, which included the full

sample of teachers included in SASS.

Teacher Class Membership

From the iterative set of models to assess fit, the four-class model of teacher perception

of principal and teacher leadership had the best fit, LMR = 23530.65 ($p < 0.001$), AIC =

2444419.69, BIC = 2446344.43 and entropy of 0.83 (*see table 15*). The comparison between the

four-class model and five-class model was not significant, LMR = 21349.43, $p = .71$. Based on

fit indices and the theoretical interpretation of the findings, the four-class model was selected as

the appropriate solution. From this nationally representative sample of teachers, I extend current

literature by defining four statistically and theoretically different types of teachers based on their

perceptions of leadership in the school while controlling for teacher background and their school

and principal characteristics.

Table 15. Two-level teacher latent class analysis: Results and fit indices

Teacher Classes	Entropy	AIC	BIC	-Loglikelihood (-LL)	% Decrease in -LL	Lo-Mendell-Rubin Test for k-1 classes	p-value
Two-class	0.84	2500603.71	2501527.92	1250192.85	----	102262.11	< 0.001
Three-class	0.84	2467870.41	2469294.88	1233767.20	1.31	32798.25	< 0.001
Four-class	0.83	2444419.69	2446344.43	1221982.85	2.26	23530.65	< 0.001
Five-class	0.86	2423153.73	2425578.74	1211290.87	3.11	21349.43	0.710

The interpretation of the findings provided information to help name these classes: *Transitioned*, *Integrated*, *Balkanized*, and *Limited* teachers. Based on their responses to survey items about principal and teacher leadership within their school, these teachers, or followers of a principal as a formal leader, perceived their role in school leadership as either: transitioned, integrated, balkanized or limited. Similar to *Integrating* principals in the principal LCA, the largest percentage of teachers (38%) were members of the *Integrated* teacher type. The next two classes with the most membership were *Transitioned* teachers (28%) and *Balkanized* teachers (26%). *Limited* teachers have the fewest number of members (12%) (*see table 16*). The probability of most likely class membership ranged from slightly under to over 90%, which demonstrates an acceptable probability that the teachers in each group were appropriately classified (*see table 17*). This means that around 90% of teachers were classified in their most likely group. Misspecifications can be due to teachers who might partially fit in more than one group.

Table 16. Two-level teacher latent class analysis: Most likely class membership

Teacher Class	Class Count	
1 *(Transitioned)*	10010	(28%)
2 *(Integrated)*	12020	(34%)
3 *(Balkanized)*	9300	(26%)
4 *(Limited)*	4230	(12%)

Note: Counts have been rounded to the nearest ten.

Table 17. Two-level teacher latent class analysis: Class probabilities for most likely latent class membership (row) by latent class (column)

Latent Class	1(T)	2 (I)	3 (B)	4 (L)
1 (T)	.87	.06	.05	.02
2 (I)	.05	.92	.02	.00
3 (B)	.05	.03	.91	.02
4 (L)	.04	.00	.04	.92

Note: 1(T) = *Transitioned*, 2(I) = *Integrated*, 3(B) = *Balkanized*, 4(L) = *Limited*

Teacher Perceptions of Leadership by Type

Two of the teacher types had similar patterns to the principal types. However, the two remaining teacher types followed a new pattern of responses. Responses from the *Integrated* teachers and *Balkanized* teachers mirrored those of *Integrating* principals and *Balkanizing* principals. The two new patterns were responses from *Transitioned* and *Limited* teachers. *Integrated* teachers most often responded that their principals practiced transactional, transformational and instructional leadership at least once a week or more (*see figure 12*).

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Transitioned teachers followed this same high pattern of response about the frequency of their principal's transactional, transformational and instructional leadership. More *Integrated* teachers responded on most items that their principal performed these leadership tasks at least once a week compared to *Transitioned* teachers. However, more *Transitioned* teachers compared to *Integrated* teachers responded that their principals *communicate expectations*, *communicate what kind of school*, and *coordinate content with other teachers* at least once a week (*see appendix F for chi square*). This difference between *Integrated* and *Transitioned* is demonstrated by the lines crossing on these items in figure 12.

Both *Balkanized* and *Limited* teachers responded less often that their principals practiced transactional, transformational and instructional leadership at least once a week. *Limited* teachers represented the lowest group with the smallest proportion of teachers who agreed that their principal demonstrated these tasks weekly with the exception of three items. *Balkanized* teachers had the fewest respond that *teachers enforce rules*, *content is coordinated with other teachers* and *principal discusses instructional practices* weekly. *Balkanized* teachers reported the least amount of principal instructional leadership. These differences are represented by *Limited* and *Balkanized* lines crossing in figure 12 (*see appendix F for chi square*).

Two additional items describe the differences between the teacher types for principal leadership that are not included in figure 12 since they were continuously scaled. The teacher groups differed on the number of *work hours in school* ($F = 21.90$, $p < .001$) and the number of *planning hours* ($F = 61.41$, $p < .001$). *Integrated* teachers reported that they work the least amount of hours in school, and they have the most planning time (*see appendix F for homogenous subsets*). *Balkanized* teachers have planning time similar to the *Integrated* teachers, yet they reported a mid-number of hours in school compared to the other groups. *Transitioned*

teachers also reported a mid-number of work hours in schools, and *Limited* teachers responded that they worked the most hours. Both *Transitioned* and *Limited* teachers had the least amount of planning time. While more *Balkanized* teachers reported less frequent principal transactional, transformational and instructional leadership, they received planning and work hours similar to *Integrated* teachers who responded most frequently that principals perform leadership tasks weekly. In responses about principal leadership, *Transitioned* teachers mirrored *Integrated* teachers; however, they received less planning time and more work hours similar to *Limited* teachers, the lowest responder for principal leadership.
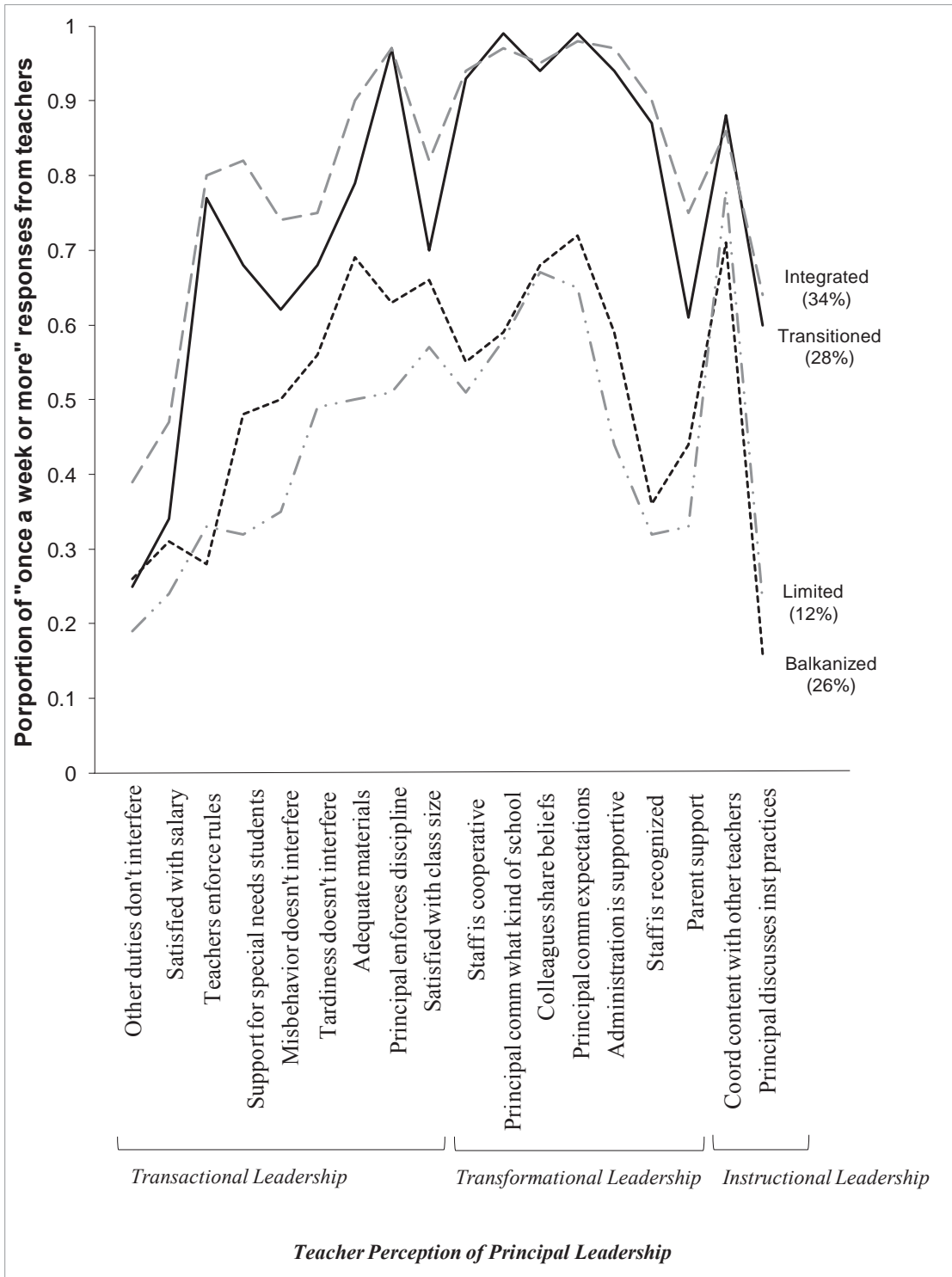
Figure 12. Line graph of the proportion of teachers in each type who responded that their principals perform transactional, transformational and instructional leadership tasks at least once a week or more.
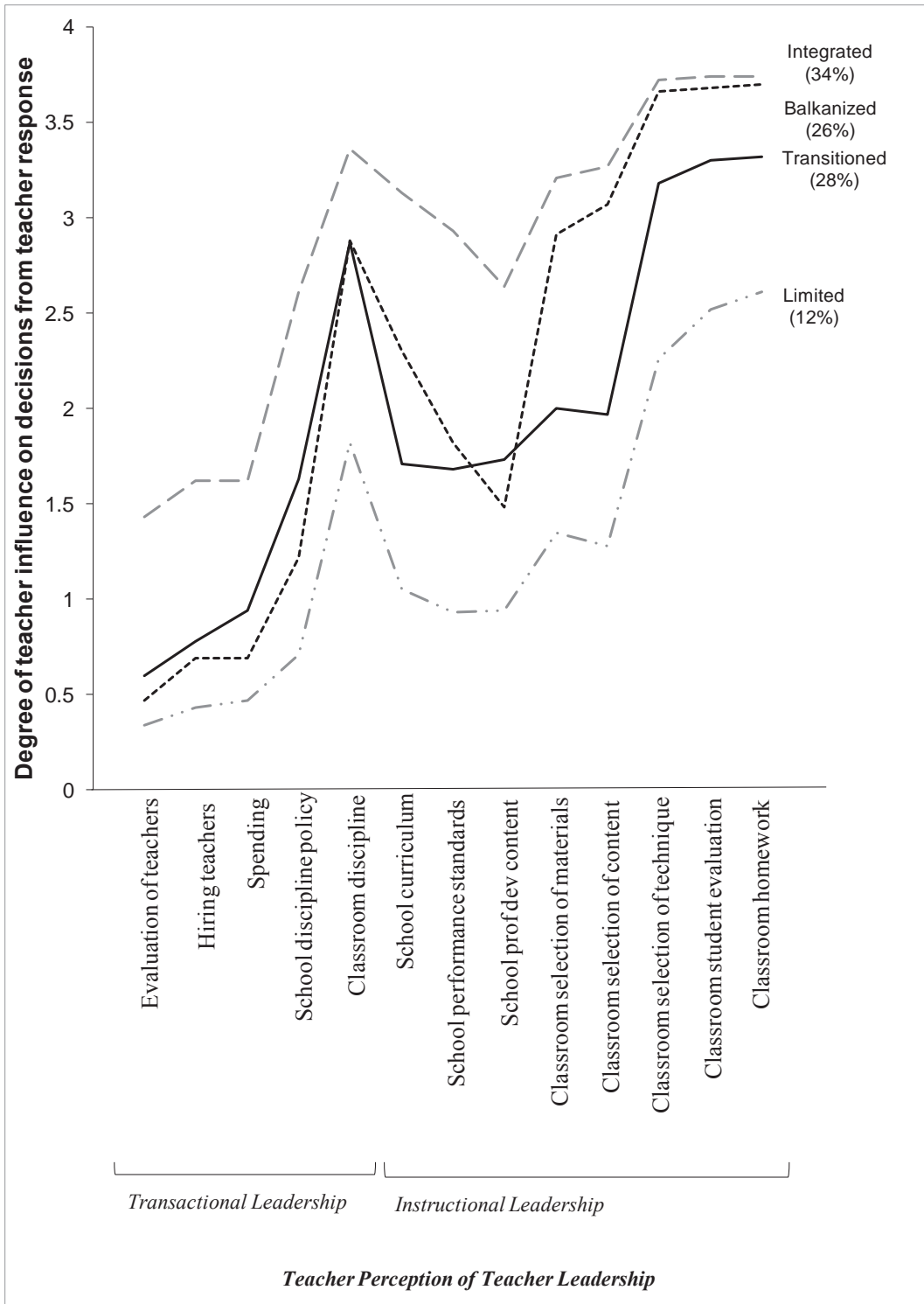
Figure 13. Line graph of the mean response of the degree to which the teachers in each type perceive that they perform transactional and instructional leadership tasks.

The response pattern of *Integrated* and *Transitioned* teachers, higher responders, and *Balkanized* and *Limited* teachers, lower responders, changes when teachers were asked about teacher leadership as opposed to principal leadership. As observed in the previous principal typology, *Integrated* teachers, similar to *Integrating* principals, remain high in their responses about both principal and teacher leadership. Further, like *Balkanizing* principals, *Balkanized* teachers responded lower on principal leadership, but higher on teacher leadership when compared to the other groups. In figure 13 compared to figure 12, *Balkanized* teachers shift from lower to higher responders. This flip from relatively low principal leadership to relatively high teacher leadership demonstrates a nuanced finding. It is a break from the low, mid, high group patterns found in most LCA results. Further, the replication of this nuance finding across principal and teacher perception models provides evidence of its validity.

Also in figure 13, *Transitioned* teachers now represent a mid-high responder, similar to *Balkanized* teachers. Because of this shift in pattern similarities across types for teacher leadership, there are now notable differences between *Transitioned* and *Balkanized* teachers. While *Balkanized* teachers reported less influence over transactional leadership tasks compared to *Transitioned* teachers, *Balkanized* teachers responded that they received more influence over instructional leadership tasks with the exception of selection of *school professional development content* (*see appendix G for ANOVA*). As found in Figure 12, figure 13 represents *Integrated* teachers as the high responders, reported the most teacher influence over transactional and instructional leadership tasks, and *Limited* teachers as the low responders, reported the least teacher influence over transactional and instructional leadership tasks. *Balkanized* teachers responded that they received more influence of instructional leadership compared to

Transitioned teachers. However, *Transitioned* teachers responded that they received more influence over transactional leadership compared to *Balkanized* teachers.

In sum, more *Integrated* teachers compared to all other groups responded that their principals perform transactional, transformational and instructional leadership tasks at least weekly. In addition, *Integrated* teachers compared to all other groups reported the most teacher influence over both transactional and instructional leadership tasks. In contrast, compared to all other groups, the *Limited* type had the fewest teachers report that their principal demonstrates transactional, transformational and instructional leadership weekly. Also, compared to all other groups, *Limited* teachers reported the least amount of teacher influence over both transactional and instructional leadership tasks.

Balkanized and *Transitioned* teachers were the two mid-level groups. For teacher perceptions of principal and teacher leadership, *Transitioned* teachers remained a mid-high responder compared to the other types. For perception of principal leadership, *Transitioned* teachers most resembled *Integrated* teachers as high responders. For perception of teacher leadership, *Transitioned* teachers were most similar to *Balkanized* teachers as mid responders. However, *Transitioned* teachers reported less teacher influence over instructional leadership compared to *Balkanized* teachers. Overall, *Balkanized* teachers were mid to low responders on perceptions of principal and teacher leadership compared to the other types. Yet, only in regards to responses about the degree of teacher instructional leadership, *Balkanized* teachers most closely mirrored the *Integrated* teachers as high responders. *Transitioned* teachers more often reported a high frequency of principal leadership and a mid-level of influence of teacher leadership. Whereas, *Balkanized* teachers less often reported a high frequency of principal leadership and a high-level of influence over only teacher instructional leadership.

Teacher, School and Principal Background as Predictors of Teacher Types

Teacher, school and principal characteristics help to identify distinctions between the types of teachers. Table 18 presents the results of the multinomial logistic regression of teacher background on each teacher type from the omnibus model. *Transitioned* teachers were used as the reference group since these teachers were consistently mid to mid-high responders. For teacher background, compared to *Transitioned* teachers, *Integrated* teachers are more likely Hispanic, African American or Asian teachers (*see table 18 for odds ratios*). However, *Integrated* teachers are less likely female. Compared to *Transitioned* teachers, *Limited* teachers are also less likely female. Thus, *Transitioned* teachers are most likely female compared to *Integrated* and *Limited* teachers and more likely white compared to *Integrated* teachers. Overall, more teacher background characteristics influenced *Integrated* teachers compared to the other groups.

Table 18. Two-level teacher latent class analysis: Means and odds ratios for teacher background variables with Transitioned teachers as the reference group

Variable	Transitioned (28%)		Integrated (34%)			Balkanized (26%)		Limited (12%)		
	Mean	Odds Ratio	Mean	Odds Ratio		Mean	Odds Ratio	Mean	Odds Ratio	
Teacher Background										
Years teaching experience	13.48	---	13.74	1.00		14.20	1.00	14.46	1.01	
Has master's degree	0.42	---	0.42	0.98		0.46	1.07	0.47	1.08	
Teacher salary in 1000s	36.45	---	35.55	1.00		36.75	1.00	37.97	1.00	
Female teacher	0.75	---	0.66	0.81	**	0.64	0.90	0.69	0.78	**
Hispanic teacher	0.04	---	0.04	1.62	**	0.04	1.30	0.06	1.01	
African American teacher	0.07	---	0.06	1.41	**	0.04	0.77	0.10	0.98	
Asian teacher	0.02	---	0.02	1.69	**	0.02	1.22	0.02	1.00	

Note: *$p \leq 0.05$, ** $p \leq 0.01$, ***$p \leq 0.001$.

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While controlling for teacher characteristics at the teacher level, principal and school background variables at the school level directly influenced teacher types. In the same multinomial logistic regression of background characteristics on teacher types in the omnibus model, table 19 presents the likelihood for a particular principal and school to have each group of teachers. With *Transitioned* teachers as the reference, *Integrated* teachers were less likely in elementary schools, in schools with fewer minority students and less often had an African American principal (*see table 19 for odds ratios*). *Integrated* teachers were more likely in rural and small enrollment schools.

With *Transitioned* teachers as a reference, *Balkanized* teachers were less likely in elementary schools, less often in schools that met state or district accountability goals and less often with female principals. However, *Balkanized* teachers were more often in rural, large and extra-large enrollment schools and were more often with African American and Hispanic principals. *Limited* teachers were less often with female principals compared to *Transitioned* teachers. In addition, *Limited* teachers were more often with African American principals and in schools with a slightly higher percentage of minority students. Based on these comparisons, *Transitioned* teachers were more often in suburban and elementary schools compared to *Integrated* and *Balkanized* teachers. Compared to *Balkanized* teachers, *Transitioned* teachers were more often in schools that met state and district goals. Overall, school structural characteristics, demographics of students in the school, principal ethnicity and gender directly predicted teacher types, or teacher perception of leadership.

Table 19. Two-level teacher latent class analysis: Odds ratios for school characteristics and school background variables with Transitioned teachers as the reference group

Variable	Integrated (34%)		Balkanized (26%)		Limited (12%)	
School Demographics						
Urban	1.05		0.97		1.20	
Rural	1.49	***	1.58	***	1.17	
Small enrollment	1.34	***	1.14		0.90	
Large enrollment	0.93		1.25	*	1.05	
Extra large enrollment	1.07		1.52	**	1.15	
Elementary level	0.49	***	0.25	***	0.78	
Percent of students eligible for FRPL	1.00		1.00		1.00	
Percent of minority students	0.99	***	1.00		1.01	*
Student/teacher ratio	1.00		0.99		1.00	
Accountability Context						
School met district or state goals	1.07		0.83	**	0.86	
Principal Background						
Female	0.92		0.75	***	0.82	*
Asian	1.21		1.11		1.22	
African American	0.75	*	1.28	*	1.77	***
Hispanic	1.30		1.73	**	1.37	
Education beyond Master's degree	1.11		1.01		1.12	
Years of experience as principal	1.00		1.01		1.00	
Years of experience as teacher	1.00		1.00		1.01	

Note: $*p \leq 0.05$, $** p \leq 0.01$, $***p \leq 0.001$.

Teacher Types and Teacher Attrition

As a last step, using ATTRIT with the full SASS sample, the teacher types were used in a subsequent multinomial logistic regression as predictors on the categories of leavers and movers with stayers as a dependent variable reference. The *Transitioned* teachers remained a reference group for the teacher types. Table 20 presents the results of this analysis. Compared to *Transitioned* teachers, both *Balkanized* and *Limited* teachers were more likely to leave teaching as a profession than stay at their current school. In addition, *Limited* teachers were more likely to move. In contrast, *Integrated* teachers were less likely to leave or move than stay, so compared to *Transitioned* teachers, mid-high responders, more *Integrated* teachers, high responders, remained at their current school (*see table 20 for odds ratios*). This finding confirms the premise

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of this study that teachers who view their school's leadership as both transformational and shared instructional are less likely to leave.

Using the 2000-2001 TFS sample of former teachers, a multinomial logistic regression for teacher types on position, occupation and necessity leavers. However, the likelihood of each teacher type to choose to either leave the teaching profession or education as an occupation compared to leaving out of necessity was not significant ($\chi^2 = 10.42$, $p = 0.11$).

Table 20. Two-level teacher latent class analysis: Odds ratios from a multinomial logistic regression of the likelihood for Integrated, Balkanized and Limited teachers compared to Transitioned teachers to be Leavers or Movers compared to Stayers

Teacher Class	Leavers (8%)		Movers (7%)	
Integrated (34%)	0.84	**	0.81	***
Balkanized (26%)	1.18	**	1.01	
Limited (12%)	1.64	***	1.33	***

In conclusion, *Integrated* teachers had the highest responses on the frequency of principal leadership and the degree of teacher leadership. The *Integrated* teachers were more likely to remain at their current school. *Limited* teachers had the lowest responses on the frequency of principal leadership and the degree of teacher leadership. *Limited* teachers were not likely to stay at their current school, they were more likely to either leave teaching or move schools. *Balkanized* teachers, mid-low responders with the exception of teacher instructional leadership, were more likely to leave the profession than stay in their current school, compared to *Transitioned* teachers. *Transitioned* teachers, high responders for principal leadership and mid responders for teacher leadership, were less likely to leave or move compared to *Balkanized* and

Limited, but more likely to leave or move than *Integrated* teachers. The likelihood of each teacher type to leave or move is consistent with the way in which they perceive the principal support and teacher autonomy in their school. The final section of the results describes the findings from the full two-level model with the simultaneous inclusion of principals and teachers.

Two-level Latent Class Analysis of Principals and Teachers

The results of this two-level principal and teacher latent class analysis answers the research question: **In what ways do *principal and teacher types* adjust when accounting for the interaction between principal and teacher perceptions and to what extent does the identification of a teacher type in a school with a principal type predict teacher attrition?** Unique to this model, principal and teacher perceptions are included as cross-level interactions to simultaneously define teacher and principal types while controlling for teacher, school and principal characteristics (*refer to Figure 7 in methods*). The inclusion of the interaction of perceptions substantially changed the principal types, but the teacher types remained the same. Unlike the two-level teacher latent class analysis, school and principal background variables are indirect controls on teacher types through principal types. The overall purpose of this final two-level model is to better understand the ways in which teacher types are distributed across the principal types. Finally, the teacher types in schools with a particular principal type are predictors of teacher attrition.

Principal and Teacher Adjusted Class Memberships

The previous principal model and teacher model set the number of principal classes and teacher classes *a priori* for this final multilevel analysis since it is not possible to calculate an LMR (Muthén, 2012). While specifying the same number of classes in this model allows for a

comparison of results across the analyses in this study, there are not fit indices that provide

evidence to confirm the number of principal and teacher classes with this model specification.

The consistency between the prior models and this final analysis allows for a better

understanding of the ways in which the simultaneous inclusion of a principal typology at the

school level and a teacher typology at the teacher level shift the interpretations of each class and

their influence on teacher attrition categories. The entropy for this model was high, 0.89 (*see*

table 21 for available fit indices).

Table 21. Two-level principal and teacher latent class analysis: Results and fit indices

Principal Classes	Teacher Classes	Entropy	AIC	BIC	-Loglikelihood (-LL)
Three-class	Four-class	0.89	2975654.01	2978087.50	1487540.01

The interpretation of two of the principal classes remained the same, *Integrating*

principals and *Balkanizing* principals. However, in the place of *Controlling* principals found in

the principal only model, the third class was named *Transitioning* principals since their responses

seemed to follow a pattern similar to *Transitioned* teachers. In addition to a newly defined class,

the membership across classes distributed differently. The largest percentage of principals were

Transitioning (38%) with *Integrating* (35%) as the next highest membership and *Balkanizing*

(27%) with the fewest principals (*see table 22*).

Table 22. Two-level principal and teacher latent class analysis: Most likely class membership

Latent Class Variable	Class	Class Count	
Principal Classes	1 *(Transitioning)*	13490	(38%)
	2 *(Integrating)*	12320	(35%)
	3 *(Balkanizing)*	9750	(27%)
Teacher Classes	1 *(Integrated)*	12000	(34%)
	2 *(Balkanized)*	9030	(25%)
	3 *(Limited)*	4170	(12%)
	4 *(Transitioned)*	10360	(29%)

Note: Counts have been rounded to the nearest ten.

There are similar class names across the principal and teacher types to demonstrate the similarities in responses. These same names across the principal and teacher classes have different endings, -ing versus –ed, to help signify which group, either principals or teachers, is discussed. Since principals are the formal leaders, principal classes end in –ing to show that they are directing the action. Since teachers are the informal leaders and followers, teacher classes end in –ed to show that they are filtering the action. Three out of the four teacher groups mirror responses from the principals groups: *Integrated* teachers/*Integrating* principals, *Balkanized* teachers/*Balkanized* principals and *Transitioned* teachers/*Transitioning* principals. The fourth teacher class was named *Limited* teachers. With the inclusion of the teacher and principal perception interaction, the members of the four teacher types, *Integrated* (34%), *Balkanized* (25%), *Transitioned* (29%), and *Limited* (12%), remained the same (*see table 22*).

Unique to this final two-level model, the membership of teacher types in principal types is provided. There are twelve possible combinations, four types of teachers in a school with one of the three types of principals. Each of these twelve class memberships, teacher types with principal types represent, is called the "latent class patterns of membership" (*see table 23*). The

largest membership pattern (13%) is *Integrated* teachers with *Transitioning* principals. The next largest membership (11%) is *Transitioned* teachers with *Transitioning* principals, *Integrated* teachers with *Integrating* principals and *Transitioned* teachers with *Integrating* principals (*see table 23*).

Table 23. Two-level principal and teacher latent class analysis: Most likely membership by pattern

Principal Class	Teacher Class		Class Count	
1 (Transitioning)	1	(Integrated)	4650	(13%)
	2	(Balkanized)	3270	(9%)
	3	(Limited)	1650	(5%)
	4	(Transitioned)	3930	(11%)
2 (Integrating)	1	(Integrated)	4030	(11%)
	2	(Balkanized)	2790	(8%)
	3	(Limited)	1570	(4%)
	4	(Transitioned)	3950	(11%)
3 (Balkanizing)	1	(Integrated)	3330	(9%)
	2	(Balkanized)	2970	(8%)
	3	(Limited)	960	(3%)
	4	(Transitioned)	2500	(7%)

Note: Counts have been rounded to the nearest ten.

The overall purpose of this principal and teacher latent class analysis is to better understand the differences across particular teacher types in a school with a particular principal type, or the membership pattern. The class probabilities are presented for each of the twelve combinations of teacher and principal types (*see table 24*). The probability of the assigned class membership as the most likely membership ranged from 84% to 92%. This demonstrates the likelihood that each teacher in each membership pattern was appropriately classified. There was approximately 6 to7% misspecification among *Integrated* and *Transitioned* teachers across all

principal types (*see table 24*). This means that 6-7% of teachers possibly resembled both *Integrated* and *Transitioned* teacher classes. *Integrated* and *Transitioned* teachers had similar responses about principal leadership, although *Integrated* teacher tended to perceive more teacher leadership.

Table 24. Two-level principal and teacher latent class analysis: Class probabilities for most likely latent class pattern (row) by latent class pattern (column)

Between/Within Pattern	1/1	1/2	1/3	1/4	2/1	2/2	2/3	2/4	3/1	3/2	3/3	3/4
1/1	.91	.02	.00	.06	.00	.00	.00	.00	.01	.00	.00	.00
1/2	.02	.89	.02	.05	.00	.00	.00	.00	.00	.01	.00	.00
1/3	.00	.04	.91	.04	.00	.00	.00	.00	.00	.00	.01	.00
1/4	.07	.05	.02	.86	.00	.00	.00	.00	.00	.00	.00	.01
2/1	.00	.00	.00	.00	.92	.02	.00	.06	.00	.00	.00	.00
2/2	.00	.00	.00	.00	.02	.90	.02	.05	.00	.00	.00	.00
2/3	.00	.00	.00	.00	.00	.04	.91	.04	.00	.00	.00	.00
2/4	.00	.00	.00	.00	.06	.04	.02	.87	.00	.00	.00	.00
3/1	.01	.00	.00	.00	.00	.00	.00	.00	.90	.02	.00	.06
3/2	.00	.01	.00	.00	.00	.00	.00	.00	.03	.90	.02	.05
3/3	.00	.00	.01	.00	.00	.00	.00	.00	.00	.05	.90	.03
3/4	.00	.00	.00	.01	.00	.00	.00	.00	.07	.06	.02	.84

Note: 1/1 = *Integrated* teachers with *Transitioning* principals, 1/2 = *Balkanized* teachers with *Transitioning* principals, 1/3 = *Limited* teachers with *Transitioning* principals, 1/4 = *Transitioned* teachers with *Transitioning* principals, 2/1 = *Integrated* teachers with *Integrating* principals, 2/2 = *Balkanized* teachers with *Integrating* principals, 2/3 = *Limited* teachers with *Integrating* principals, 2/4 = *Transitioned* teachers with *Integrating* principals, 3/1 = *Integrated* teachers with *Balkanizing* principals, 3/2 = *Balkanized* teachers with *Balkanizing* principals, 3/3 = *Limited* teachers with *Balkanizing* principals, 3/4 = *Transitioned* teachers with *Balkanizing* principals

When comparing teacher types from the previous teacher only model to teacher types from the current principal and teacher model, 97% of teachers remained in the same group. The random error added into the full two level model from the free thresholds and intercepts of the survey indicators, which allowed the principal and teacher types to influence each other, may have contributed to this slight change in membership across groups. The 3% difference in membership does not exceed a 95% confidence interval for a difference possibly due to random error. Since the membership of each teacher group and the interpretation of each type based on teacher responses did not substantively change, a description of the teacher groups is not provided for this final model (*refer to figures 12 and 13 in previous section*). However, the difference in the proportion of members from the previous principal only model to this current two level model exceeded 5%. For example, the number of principal members in the *Integrating* types shifted from 54% to 35%, so there was at least a 19% change in membership. The exact change in membership was not calculated since the interpretation of one of the classes changed as well (*i.e. Controlling* to *Transitioning*). This change in membership and interpretation across the principal types when including the cross-level interaction between principal and teacher perception provides evidence to justify the ways in which these stakeholder's perceptions should be used in future studies. The ways in which principal perceptions of leadership changed for each of these adjusted principal types is discussed below.

**Principal Perception of Leadership by Adjusted Type**

The interpretation of the *Integrating* and *Balkanizing* principals remained somewhat consistent from the previous principal only model to the current final model for principal perception of principal leadership. *Transitioning* principals are a new type with a response pattern similar to the prior *Controlling* principals for principal perceptions of principal

leadership. *Transitioning* principals were mid to high responders that somewhat mirrored *Integrating* principals. However, more *Transitioning* principals responded that they *maintained physical security* and *facilitated student learning* at least once a week compared to *Integrating* principals (*refer to appendix H for chi square*).

Overall, the main difference between the groups for this model was based on the proportion of principals in each type who responded that they *provided professional development activities* at least once a week or more (*see figure 14*). All *Integrating* principals reported that they provided professional development once a week. No *Transitioning* principals reported that they provided these activities weekly. Only 14% of *Balkanizing* principals responded that they supplied professional development weekly. The 0% to 100% difference in the number of principals who responded that they provided professional development weekly may seem as though it resulted from a modeling issue. However, this is not the case. Muthén (2007) explains that in fact this disparity helps to interpret the classes. The *Integrating* and *Transitioning* principals extremely differed in their response to this item.

Two additional principal perception of principal leadership items were utilized in this model that were not depicted in figure 14 since they were continuously scaled, principal perception of *percent of teachers teaching to high standards* and *social disorder* (*refer to appendix H for ANOVA*). *Transitioning* and *Integrating* principals reported a similar number of teachers teaching to high standards, which was significantly higher than the number of teachers reported by *Balkanizing* principals ($F = 61.10$, $p < .001$). *Integrating* principals reported the lowest degree of social disorder, *Transitioning* principals a mid-degree and *Balkanizing* principals a relatively higher degree ($F = 16.28$, $p < .001$). These results are consistent with the response patterns for the other principal perception of principal leadership items.
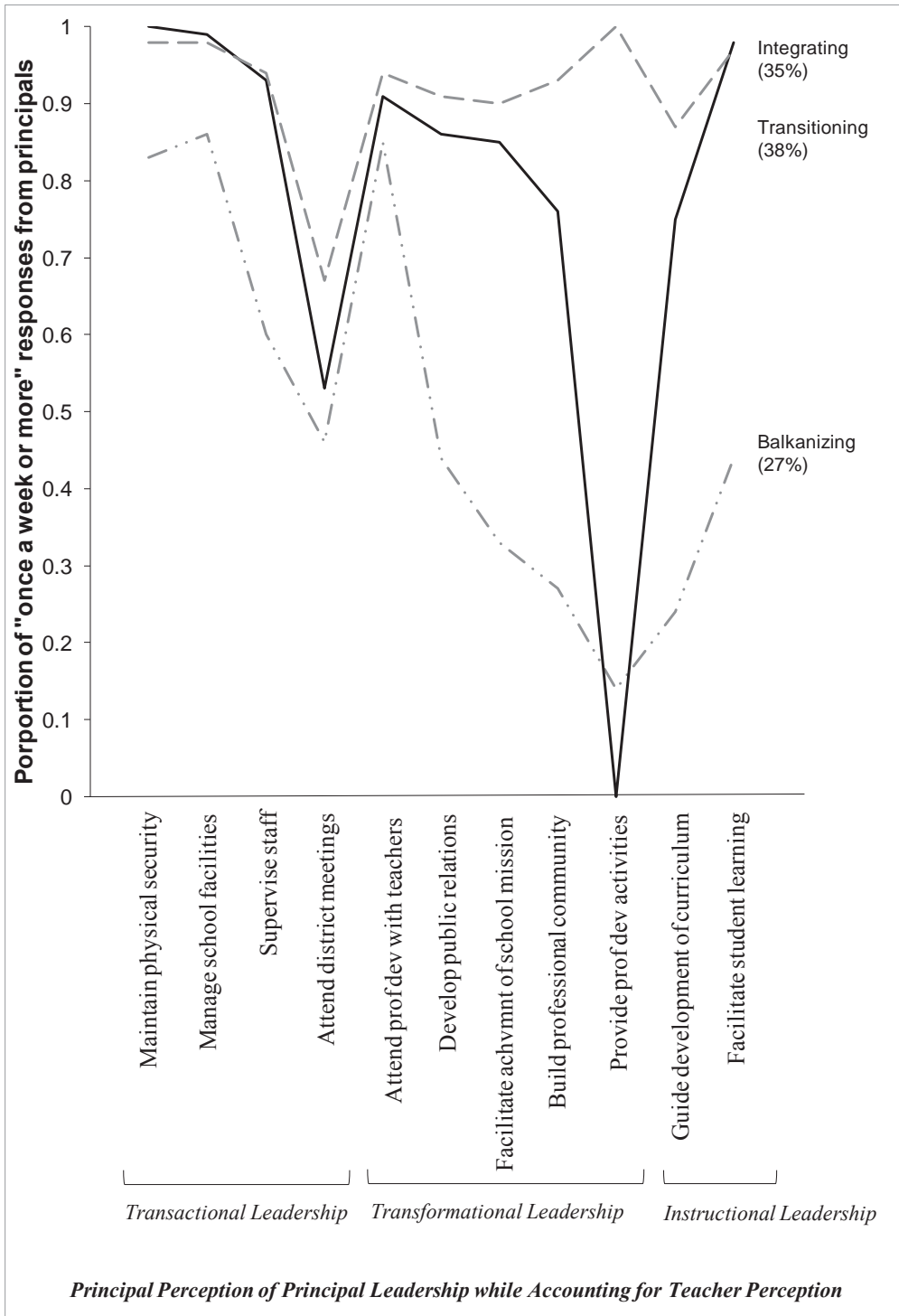
Figure 14. Line graph of the proportion of principals in each type who responded that they perform transactional, transformational and instructional leadership tasks at least once a week or more while accounting for teacher perception.
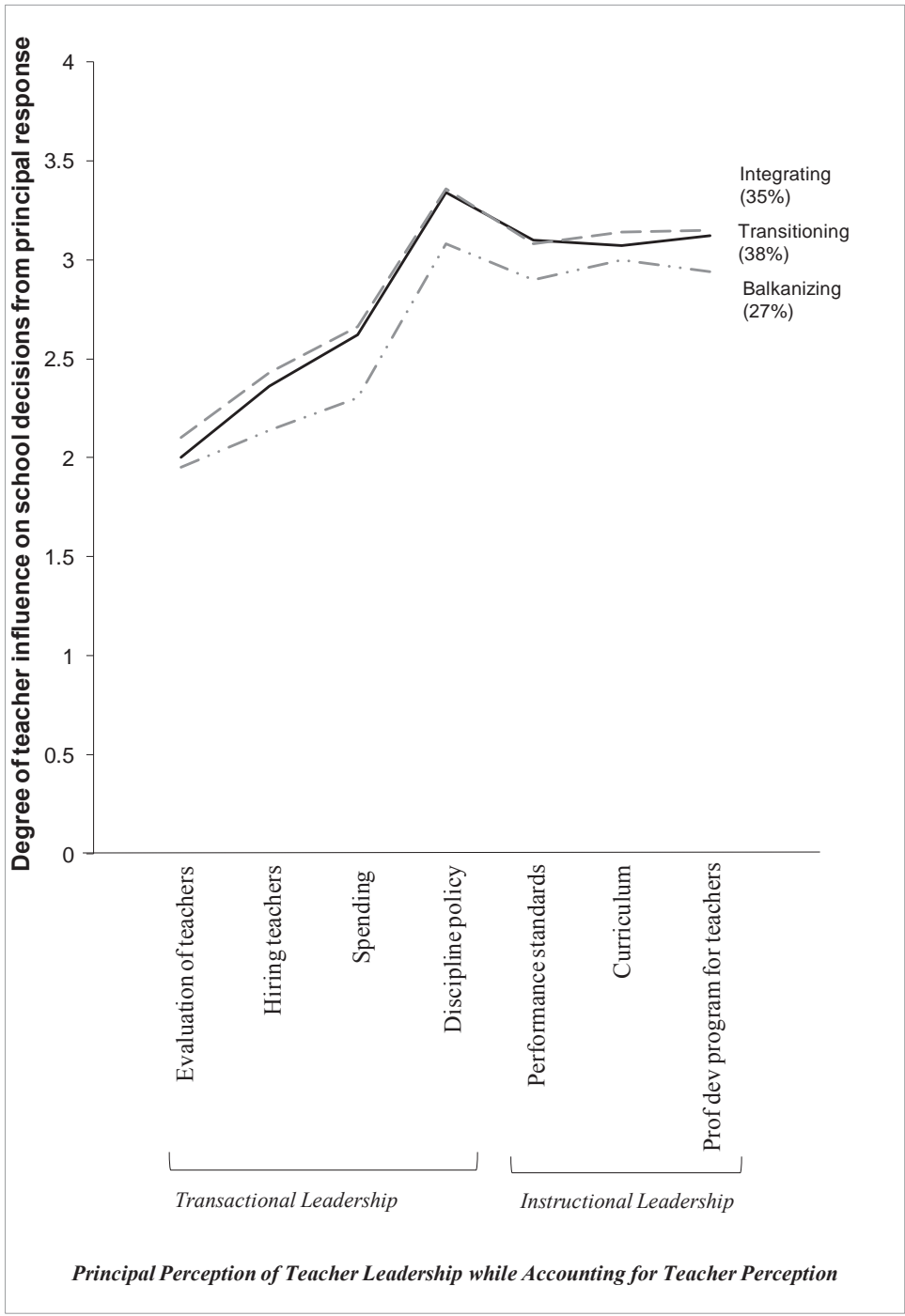
Figure 15. Line graph of the mean response of the degree to which the principals in each type perceive that they share transactional and instructional leadership tasks with teachers while accounting for teacher perception.

For principal perception of teacher leadership, there were differences between this new *Transitioning* principal type and the previous *Controlling* type in the principal perception only model as well as differences between the new *Transitioning* principal and the corresponding *Transitioned* teacher type (*see figure 15*). In a previous principal only model, the *Controlling* group had higher responses for principal leadership, but lower responses for teacher leadership. Whereas, the new type, *Transitioning* principals, remained a high responder for the teacher leadership items (*see figure 15*). In addition, these *Transitioning* principals differed from the *Transitioned* teachers since their responses remained high rather than flipping below *Balkanizing* on items that measure teacher classroom autonomy. However, this difference between *Transitioned* teachers and *Transitioning* principals is due to a lack of measures of teacher classroom autonomy at the principal level. Principals were asked about the degree of teacher influence over school instruction not classroom instruction.

There were significant differences between the new *Transitioning* principal type and the other principal types in this model. *Integrating* and *Transitioning* principals had homogeneous responses with the exception of one item (*see appendix I for ANOVA*), teacher influence over *curriculum*. *Integrating* principals reported that they provided teachers with more influence over the school curriculum compared to *Transitioning* principals (*see figure 15*). *Balkanizing* principals perceived less principal and teacher leadership compared to *Transitioning* principals. While *Balkanizing* principals appear relatively low compared to *Integrating* and *Transitioning*, the *Balkanizing* principal responses to principal and teacher leadership items did not change from the previous principal only model to the current model. Since the *Controlling* principal type no longer exists when accounting for the interaction between principal and teacher perceptions, the *Balkanizing* principal type now appears to be the low group, but the responses have not changed.

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Balkanizing, *Transitioning* and *Integrating* principals all responded that teachers were given a relatively high degree of teacher leadership.

Overall, compared to the previous principal only model, in this current full model, there were fewer differences in the ways that the principal types responded to the degree of teacher leadership. The previous differences found in teacher leadership by the principal types have been accounted for by teacher perception in the teacher types. This main finding of the current two-level model suggests that the differences in teacher leadership are best explained at the teacher level. Teacher leadership is best defined by the differences between teachers not the differences in how the principals view the teacher leadership in the school. This means that teachers within the same school would have different perceptions about the amount of influence provided to them. While principals may view themselves as more *Controlling*, there will be teachers within the same school who perceive that influence has been given to them.

In sum, *Integrating* principals remained the high responders for principal and teacher leadership. *Balkanizing* principals were low responders for principal leadership, especially for transformational and instructional leadership. However, *Balkanizing* principals' responses to teacher leadership, although lower than *Integrating* and *Transitioning*, followed a similar high response pattern. *Transitioning* principals were mid-high responders for principal leadership and a high responder, similar to *Integrating*, for teacher leadership. In addition, the frequency of professional development helped to define the difference between these principal groups with teacher perceptions included in the model.

Relationship between Transformational and Shared Instructional Leadership

Since the interpretation of the principal types shifted with the inclusion of teacher perception, these principal types were re-plotted on the Marks and Printy (2003) replication

graph (*refer to figure 10 for a reprint of the graph*) to demonstrate the relationship between transformational leadership and shared instructional leadership for each principal type. In comparison to prior findings in the plot from the previous principal only model (*figure 11*), *Balkanizing* and *Integrating* remained in a similar position, but *Transitioning* (as opposed to *Controlling* principals in the principal only model) almost aligns with *Integrating* on shared instructional leadership (*see figure 16*). This change represents the difference in the relationship between transformational and shared instructional leadership for each principal type when accounting for teacher perception.

Of note, the variance, or length of error bars, in shared instructional leadership across the principal types represent a wider range. This demonstrates that with teacher perception included in the model, not only did the *Controlling* principal no longer exist, but the range of shared instructional leadership within each principal type increased. This shows that with teacher perception included there is more error in the classification of principals on shared instructional leadership. These error bars for all principal types overlap for shared instructional leadership. Further, the centroid for the *Transitioning* principal is almost situated within the upper left quadrant. Which is in contrast to the findings of the previous principal only model and of Marks and Printy (2003), high transformational leadership is necessary for high shared instructional leadership. Although teachers may view themselves as having influence or not having influence, their perceptions may not accurately represent the difference in shared instructional leadership across schools.
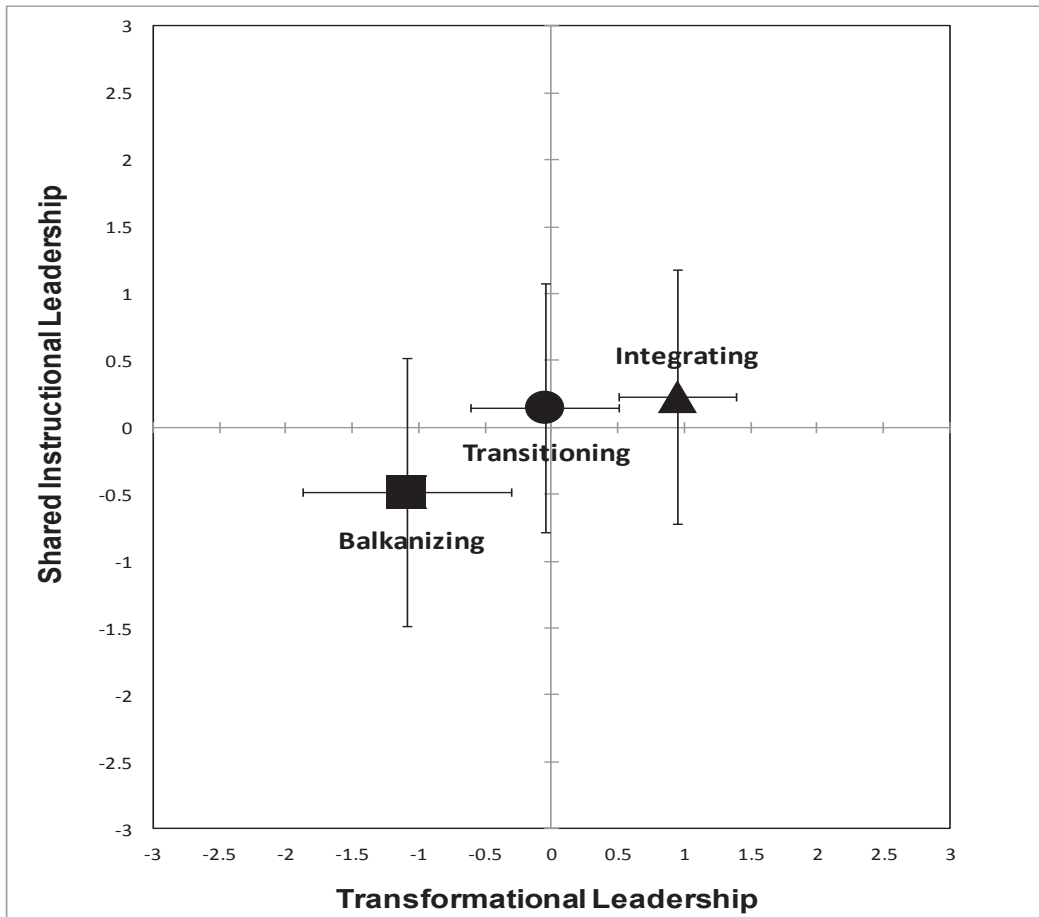
Figure 16. Relationship between transformational and shared instructional leadership by principal type with a nationally representative sample of schools while accounting for teacher perception.

Teacher Background as Predictors of Teacher Types

In this model, the results of the multinomial logistic regression of background variables on types changed compared to the previous models. The results from principal and school characteristics on principal types shifted since the membership and interpretation of the principal groups changed. For teachers, the results of the teacher background on teacher types are no longer consistent with the teacher only model since school and principal characteristics are not

direct controls. The influence of school and principal characteristics on teacher types is mediated through the principal types.

Although the teacher types did not change in this final model, the results of teacher background on teacher types changed since school and principal characteristics were included as indirect controls. *Transitioned* teachers remained the reference group as in the previous model. Compared to *Transitioned* teachers, *Integrated* teachers were less likely to have a higher salary and to be female, yet more likely to have more teaching experience (*see table 25*). *Balkanized* teachers more often had a master's degree, but were less often female and African American and more frequently received a lower salary than *Transitioned* teachers. Finally, *Limited* teachers compared to *Transitioned* teachers were less often female and more often Hispanic and African American (*see table 25*). This means that *Transitioned* teachers were mainly female, more often had a greater salary than *Integrated* and *Balkanized*, were more often African American compared to *Balkanized*, but more often White compared to *Limited* teachers (*see table 25*).

In sum, without school context as a direct control, teacher background had more influence on each of the teacher types. Further, with these direct school context controls, Hispanic and African American teachers were more likely *Integrated* teachers, or the highest responders. In the current model, without the direct school context controls, Hispanic and African American teacher were more likely *Limited* teachers, or the lowest responders. This finding suggests that school context has a direct influence on the ways in which a teacher's background influences their perceptions of the leadership.

Table 25. Two-level principal and teacher latent class analysis: Means and odds ratios for teacher background variables with Transitioned teachers as the reference group

Variable	Integrated 34%		Balkanized 25%		Limited 12%		Transitioned 29%	
	Mean	Odds Ratio	Mean	Odds Ratio	Mean	Odds Ratio	Mean	Odds Ratio
Teacher Background								
Years teaching experience	13.75	1.01 **	14.21	1.01	14.57	1.01	13.47	---
Has master's degree	0.42	1.04	0.47	1.16 *	0.47	1.02	0.43	---
Teacher salary in 1000s	35.57	0.99 ***	36.75	0.99 *	38.06	1.00	36.41	---
Female teacher	0.66	0.64 ***	0.64	0.56 ***	0.69	0.73 ***	0.73	---
Hispanic teacher	0.04	1.01	0.04	0.97	0.06	1.36 *	0.04	---
African American teacher	0.06	0.86	0.04	0.70 *	0.10	1.68 **	0.07	---
Asian teacher	0.02	1.16	0.02	0.84	0.02	1.34	0.01	---

Note: *$p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

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School and Principal Background as Predictors of Adjusted Principal Types

For the multinomial logistic regression of school and principal characteristics on principal types, *Balkanizing* principals remained the reference group as in the prior principal model. Table 26 presents the means and odds ratios for each variable. Compared to *Balkanizing* principals, *Transitioning* principals were less often in small enrollment schools and less likely Asian principals, but they were more often in schools with a higher percentage of minority students, in school that met state and district accountability goals and more likely female. *Integrating* principals compared to *Balkanizing* principals were less often in rural, small enrollment, extra large enrollment schools and less likely Asian principals. In contrast, *Integrating* principals were more likely to have a higher percentage of minority students, in schools that met state and district accountability goals and more often female, had an education beyond a master's degree and more principal experience (*see table 26)*. Based on these findings, *Balkanizing* principals were more often in small enrollment schools and Asian principals, and less often in schools with more minority students, schools that met state and district accountability goals and were less often female. Finally, compared to *Integrating*, *Balkanizing* principals had less principal experience and less often had education beyond a master's degree (*see table 26*).

In sum, school size, percent of minority students, whether or not the school met district or state goals, and principal gender were significant predictors of all of the principal types. Asian ethnicity was also predictors of all principal types. However, while the data is nationally representative, there were few Asian principals included in the sample and less than one percent or one percent across each principal type. The significance of this variable could be due to a Type I error. Most interestingly, when these principal types were adjusted with the inclusion of

teacher perception in the model, *Integrating* principals were more like to have graduate

education beyond a master's degree as well as more principal experience. This finding may

demonstrate a way in which to link principal preparation programs to principal behaviors and

school effectiveness.

Table 26. Two-level principal and teacher latent class analysis: Means and odds ratios for school characteristics and principal background variables with Balkanizing principals as the reference group

| Variable	Transitioning 38%			Integrating 35%			Balkanizing 27%	
	Mean	Odds Ratio		Mean	Odds Ratio		Mean	Odds Ratio
School Demographics								
Urban	0.24	1.17		0.26	1.13		0.17	---
Rural	0.31	0.85		0.26	0.76	*	0.41	---
Small enrollment	0.66	0.75	**	0.64	0.74	**	0.73	---
Large enrollment	0.05	0.81		0.05	0.76		0.04	---
Extra large enrollment	0.02	0.75		0.02	0.66	*	0.02	---
Elementary level	0.60	1.17		0.62	1.16		0.54	---
Percent of students eligible for FRPL	41.76	1.00		42.16	1.00		39.18	---
Percent of minority students	32.51	1.01	***	36.49	1.01	***	25.09	---
Student/teacher ratio	15.47	1.01		16.30	1.01		14.99	---
Accountability Context								
School met district or state goals	0.63	1.49	***	0.61	1.36	**	0.55	---
Principal Background								
Female	0.45	1.42	***	0.46	1.44	***	0.34	---
Asian	0.00	0.24	**	0.01	0.41	*	0.01	---
African American	0.11	0.88		0.13	1.10		0.08	---
Hispanic	0.04	0.74		0.07	1.24		0.04	---
Education beyond Master's degree	0.43	1.04		0.47	1.23	*	0.41	---
Years of experience as principal	8.37	0.99		9.45	1.01	*	9.10	---
Years of experience as teacher	13.91	0.99		14.23	1.01		13.84	---

Note: *$p \leq 0.05$, ** $p \leq 0.01$, ***$p \leq 0.001$.

Distribution of Teacher Types across Adjusted Principal Types

In the omnibus model, the relationship between principal types and teacher types was tested with a multilevel multinomial logistic regression of the between level, principal, classes on the within level, teacher, classes. Figure 17 depicts this relationship by accounting for the proportion of each teacher type in each principal type. Table 27 presents the odds ratios for each principal class on each teacher class. The multinomial logistic regression had two reference groups, *Balkanizing* principals for the predictor variable and *Transitioned* teachers for the dependent variable. *Transitioning* and *Integrating* principals were less likely to have *Balkanized* teachers compared to *Balkanizing* principals. However, *Transitioning* and *Integrating* principals were more likely to have *Transitioned* teachers compared to *Balkanizing* principals. Finally, *Integrating* principals with *Balkanizing* principals as a reference were less likely to have *Integrated* teachers compared to *Transitioned* teachers. Overall, across all groups, *Transitioned* teachers and *Balkanized* teachers were not randomly distributed. *Transitioned* teachers, mid-high responders, more often were with *Integrated* principals, high responders, and *Transitioning* principals, who had a similar response pattern. Further, *Balkanized* teachers were more often with *Balkanizing* principals who mirrored their responses.

While *Balkanized* and *Transitioned* teachers were not randomly distributed across principal types, *Limited* and *Integrated* teachers were randomly distributed. No matter the principal type, there were *Limited* teachers and *Integrated* teachers within a school. These high and low teacher responders were not associated with a particular principal type. This means that these teacher types do not represent a leadership or organizational effect. For these teacher types, their perceptions vary based on their individual experience. Further, emerging research (Goldring *et al.*, 2012) suggests that teachers conflate their view of the leadership with the degree that they

like or fit with the principal. When interpreted through the teacher retention framework of this study, this finding would suggest that teacher perception of leadership might be a representation of a teacher's satisfaction within their school.
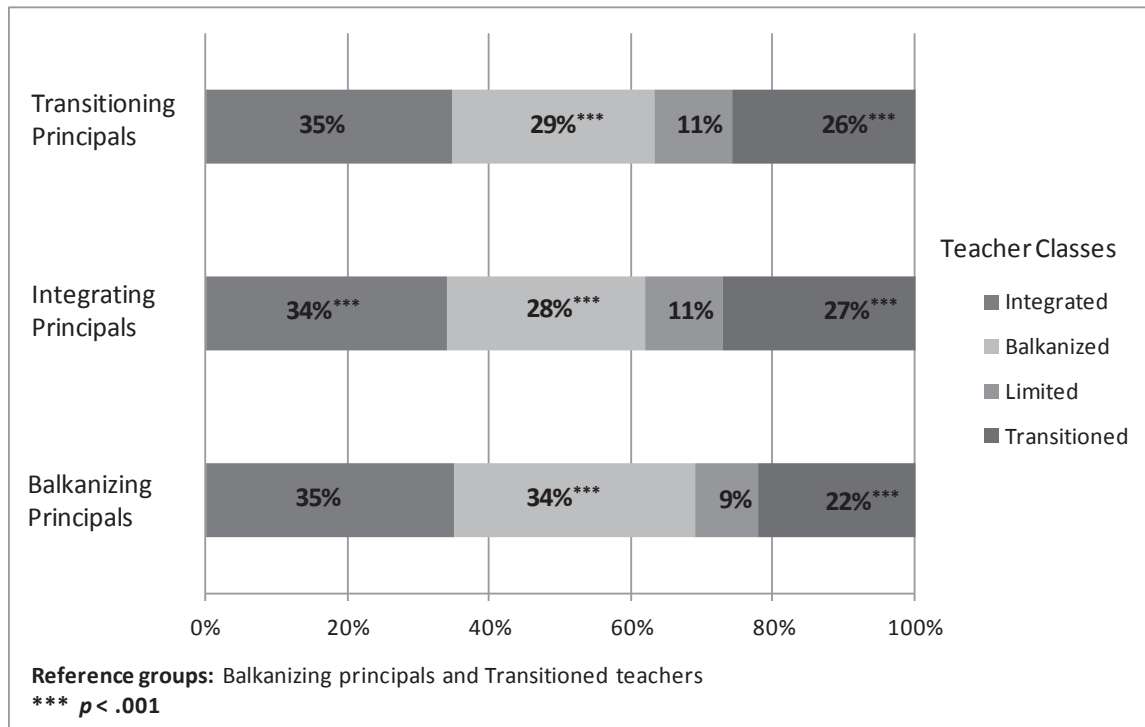
Figure 17. Proportion of Integrated, Balkanized, Limited and Transitioned teachers in schools with Transitioning, Integrating and Balkanizing principals.

Table 27. Two-level principal and teacher latent class analysis: Odds ratios of the likelihood of Transitioning and Integrating principals compared to Balkanizing principals to have Integrated, Balkanized and Limited teachers compared to Transitioned teachers

Principal Class	Integrated Teachers		Balkanized Teachers		Limited Teachers	
Transitioning	0.91		0.72	***	1.05	
Integrating	0.81	***	0.63	***	0.99	

Note: *$p \leq 0.05$, ** $p \leq 0.01$, ***$p \leq 0.001$.

Teacher Types in Adjusted Principal Types and Teacher Attrition

Each membership pattern, teacher types in a school with a particular principal type, was used as a predictor on the teacher attrition categories, leavers, movers and stayers using ATTRIT, which includes the full SASS sample (*see Table 28*). *Transitioned* teachers with *Balkanizing* principals and *stayers* were used as the reference groups. The results in Table 28 demonstrate that *Balkanized* and *Limited* teachers, the low to mid-low responder groups, were more likely to leave teaching as a profession regardless of the principal type. Since these low responders were more likely to leave the next year, this supplies evidence that these teachers were possibly dissatisfied and conflated their level of satisfaction with their response about the leadership within their school.

Most importantly, as argued in this study, *Integrated* teachers were less likely to leave *Integrating* principals compared to *Transitioned* teachers with *Balkanizing* principals. This finding confirms that principals who view themselves as providing integrated leadership and have teachers who also view them as providing integrated leadership retain more teachers. This finding supports two important conclusions. First, principals who practice both transformational and shared instructional leadership can retain more teachers. Second, a congruency between principal and teacher perceptions, or the ability for a principal to influence teachers' perceptions of the leadership within the school, is necessary in order for principals to help manage the retention of teachers.

Table 28. Two-level principal and teacher latent class analysis: Odds ratios from a multinomial logistic regression of the likelihood for each latent class pattern compared to Transitioned teachers in schools with Balkanizing principals to be Leavers or Movers compared to Stayers

Latent Class Patterns	*Leavers*		*Movers*	
With Transitioning Principals				
Integrated	0.96		0.85	
Balkanized	1.26	*	1.08	
Limited	1.78	***	1.37	*
Transitioned	1.13		1.01	
With Integrating Principals				
Integrated	0.98		0.79	*
Balkanized	1.60	***	1.09	
Limited	2.01	***	1.35	*
Transitioned	1.27	*	1.01	
With Balkanizing Principals				
Integrated	0.91		0.85	
Balkanized	1.28	*	1.08	
Limited	1.71	***	1.22	

Note: *$p \leq 0.05$, ** $p \leq 0.01$, ***$p \leq 0.001$.

CHAPTER FIVE: DISCUSSION

This chapter discusses the contribution of the results from each of the three models to the current literature. After a summary of main findings, the contribution of each model is discussed, this outlines the overarching contribution of this dissertation study to school leadership and teacher retention literature. Future directions of research and implications are discussed within these contributions. Next, the limitations of the study are described. This chapter ends with concluding thoughts on suggestions for the field of educational leadership research.

Overall, this study sought to answers the following guiding questions:

1. What types of principals and teachers exist in school leadership across the U.S.?

2. To what extent do these different types of teachers and principals in school leadership predict teacher retention?

There are three main reasons why the three sequential latent class analyses were necessary in order to answer these questions. First, leadership has rarely been studied as person-centered, differences across leaders, as opposed to variable-centered, similarities and effectiveness of behaviors. Because we have yet to understand the ways in which leaders differ across the U.S., preliminary investigations into the principal types, and then, teacher types were necessary in order to finally understand how these types influenced each other. Second, previous literature rarely distinguishes between stakeholders perceptions as separate measures. The appropriate use of teacher perceptions, commonly used, and principal perceptions, less commonly used, has not been established within the study of school leadership. We have yet to understand what teacher perceptions compared to principal perceptions actually measure. In this study, the use of teacher perceptions and principal perceptions as indicators of types in separate models, followed by their simultaneous use in an omnibus model, provides evidence of what

they measure independently and what they explain when used together. Finally, in addition to not understanding the ways in which leaders differ and stakeholders' perceptions of leadership differ, few direct links have been established between different types of school leaders and teacher attrition. Inconsistent and overuse of attitudinal proxies related to teacher retention as well as our lack of distinctions between leaders have not supplied evidence of this relationship. In the same way that the sequential models lead to a better understanding of the independent as well as simultaneous explanations of different types of teachers and principals, the use of teacher attrition as an outcome in these independent and simultaneous models provides evidence of a direct link to teacher attrition using each possible measure of the differences between school leaders. In sum, this study examined the extent that types of principals using principal perceptions predict teacher attrition, types of teachers using teacher perceptions predict teacher attrition, and the extent that the interaction between types of principals and types of teachers, using both teacher and principal perception, predict teacher attrition.

Summary of Main Findings

Each of the three latent class analysis models resulted in main findings that extend the literature. In addition, based on the evidence collected from the three models, this study provides broader conclusions about the study of school leadership and teacher retention.

The principal latent class analysis had four main findings. First, there were three different types of principals, *Integrating*, *Balkanizing* and *Controlling* when using only principal perceptions as indicators of the differences between these leaders. These types significantly differed on the ways in which they perceived their own leadership and the teacher leadership within the school. Second, a plot of the relationship between transformational and shared instructional leadership by each of these principal types demonstrated that *Integrating* principals

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were the only group that viewed themselves as high transformational and high shared instructional. Using nationally representative data, this finding shows that transformational leadership is necessary for shared instructional leadership. There was not a principal type that was high shared instructional and low transformational. Third, school and principal context, size, grade level, percent of minority students and principal gender, influenced the different principal types. Fourth, teachers in schools with *Controlling* principals were more likely to leave their teaching position, but continued working in education or schools. This model adds to the emerging literature on principal perception (Evans, in press; Leithwood & Janzti, 2008; Urick & Bowers, 2011). Principal perception is important since the principal is the formal leader and makes decisions that contribute to the ways in which teachers experience the school environment.

The two-level teacher latent class analysis had three main results. First, there were four different types of teachers, *Integrated*, *Transitioned*, *Balkanized*, *Limited*. The perceptions of *Integrated* and *Balkanized* teachers mirrored those of *Integrating* and *Balkanizing* principals, which showed some congruency and validity of these types across these independent models. Second, teacher as well as school context helped to predict teacher types. With school context as a direct control, Hispanic, African American and Asian teachers were more likely to be in the *Integrated* subgroup. Third, *Integrated* teachers were more likely to stay, whereas *Limited* teachers were more likely to move or leave. This finding show that teacher perception of leadership might be a measure of a teachers' overall satisfaction since the high responders were retained and the low responders left. While teacher perceptions have been commonly used in previous literature, they are often aggregated to represent a possible organizational effect. Further, teacher perceptions of leadership are often viewed as a reliable evaluation of the

leadership within the schools. This model adds to the literature in two ways. First, teacher perceptions are conceptualized and situated as individual teacher experiences rather than a snapshot of a larger organizational effect. Second, with teacher attrition as the direct outcome of these teacher types, these findings highlight the extent that their individual view of the leadership leads to their decisions to move schools. The connection between teacher perception and teacher attrition or mobility is important because it positions these perceptions as indicators of their degree of satisfaction within the school. Teachers might conflate their agreement, fit or likability of their principal with their view of school leadership (Goldring *et al.*, 2012). This model supplies a better understand of what teacher perceptions of leadership measure.

The two-level principal and teacher latent class analysis had four main findings. First, only the principal types shifted when accounting for the interaction between teacher and principal perceptions. The *Controlling* principals shifted to a different type and there were no longer substantive differences in the ways that all principal types viewed teacher leadership. Further, for each adjusted principal type there was more error or variance in the way that shared instructional leadership was viewed within the group. Second, school and teacher context variables still influenced the principal and teacher types. However, without school context as a direct control on teacher types, Hispanic, African American and Asian teachers were now more likely to be *Limited* teachers. Interestingly, while *Integrating* and *Transitioning* principals appeared to be similar groups, *Integrating* principals were more likely to have advanced graduate education and more experience as a principal. Third, teacher types did not randomly distribute across principal types. *Integrating* and *Transitioning* principals were more likely to have *Transitioned* teachers. In addition, *Balkanizing* principals were more likely to have *Balkanized* teachers, which demonstrate congruency across principal and teacher perceptions and possibly an

organizational effect. Yet, *Integrated* and *Limited* teachers, the high and low responders, were evenly distributed across the principal types, which may demonstrate that teacher perceptions are a partial measure of individual fit or satisfaction/likability of principal. Fourth, while *Limited* and *Balkanized* teachers were still more likely to leave regardless of principal type, *Integrated* teachers with *Integrating* principals were less likely to move schools. When comparing these findings, interactions between principal and teacher types on teacher attrition, with the findings from the previous two models, independent principal and teacher types on teacher attrition, several conclusions about school leadership and teacher retention were discovered.

From this study, five main conclusions are drawn. First, using a person-centered framework and analysis to examine different types demonstrates that leadership is multidimensional. Leaders simultaneously practice multiple leadership styles. Past prominent leadership styles do not define the ways in which leaders differ across schools. Second, centralized leadership is important. Both teacher types, *Balkanized* and *Limited*, who experienced less principal leadership, were more likely to leave. This conclusion mirrors the argument of Marks and Printy (2003). Transformational leadership, centralized, is necessary for effective forms of distributed leadership, or shared instructional leadership. While this study shows that both centralized and decentralized approaches to leadership are important, a recent surge of distributed leadership research and a push for greater teacher autonomy for teacher retention may miss the ways in which centralized principal leadership contributes to the effects of distributed leadership. Third, principal and teacher perceptions of leadership are congruent in many ways, but they are separate measures. Principal perception better represent the school level decisions that are made. Teacher perceptions represent their individual experiences of the school leadership and perhaps their degree of satisfaction or fit within the school. Fourth, teacher,

school and principal context influence how leadership is perceived and the different types of principals and teachers within school leadership. Finally, testing the extent that teacher and principal types within school leadership predict teacher attrition presents a more comprehensive view of the difference ways in which principals might manage the retention and attrition of teachers.

Contribution of the Principal Latent Class Analysis

Principal Types

A long history of educational leadership research has utilized leadership styles to define different types of leaders (Robinson, Lloyd & Rowe, 2008). However, few studies have used measures of several leadership styles under the assumption that multiple leadership styles simultaneously have a positive influence on outcomes (e.g. Bogler, 2001). The present model demonstrated, with the description of three different types of principals, *Balkanizing*, *Controlling* and *Integrating*, that principals enact several different leadership styles in their role as a school leader. *Balkanizing*, *Controlling* and *Integrating* principals had a relatively high number of responses that they practiced managerial tasks-transactional leadership (Bass, 1985; Firestone & Wilson, 1985). Both *Controlling* and *Integrating* principals responded that they practiced transformational and instructional leadership frequently. Yet, compared to *Integrating* and *Balkanized* principals, *Controlling* principals less often shared managerial or instructional leadership tasks with teachers. Knowing that principals use several leadership styles within their role, future research that attempts to measure the extent of principal influence on outcomes should focus on measuring their leadership using a set of core behaviors (see Leithwood, Patten & Jantzi, 2010; Robinson, Lloyd & Rowe, 2008) or multiple leadership styles in order to capture a complete range of leadership tasks rather than limiting principal behavior to individual

leadership styles. If the intent of future research is to further describe the ways in which principals or teachers vary across schools using a chosen set of behaviors, then latent class analysis or mixture models would help to identify types of educators and describe the different ways in which tasks are multidimensional, or simultaneously performed between the types.

In order to connect this typology with previous literature, I examined the relationship between transformational and shared instructional leadership for each type of principal to confirm the prior finding that only schools with high transformational leadership practiced high shared instructional leadership (Marks & Printy, 2003). Using nationally representative data, I confirmed that *Integrating* principals practiced both high transformational and high shared instructional leadership as postulated by Marks and Printy (2003). In addition, I showed that *Controlling* principals had mid-level transformational leadership and low shared instructional leadership, and *Balkanizing* principals had slightly higher shared instructional leadership compared to *Controlling* principals, but less transformational leadership. Neither centroid for *Balkanizing* nor *Controlling* was situated within the middle of a positive quadrant indicating that their transformational and shared instructional leadership were both low in comparison to *Integrating* principals. In the Marks and Printy (2003) study, the schools without integrated leadership were described as either: not having a principal, having a new or interim principal, or not sharing instructional decisions with teachers, but sharing other leadership tasks with teachers.

In addition to the replication of Marks and Printy (2003), to extend current literature, I found that *Balkanizing* principals ceded both instructional and managerial leadership to teachers, whereas *Controlling* principals more often withheld leadership from teachers. These two types of principals are important because they provide evidence of differences in school leadership across schools. The other two models in this study account for teacher perceptions which account

differences in the individual experiences of teachers and do not supply clear understanding of what is happening with the leadership at the school level. These findings are novel because they are defined by only principal perception. The *Balkanizing* and *Controlling* types explain the ways in which principals choose to lead their school beyond previously established notions of idealized leadership. The study of principal perceptions has been limited (Leithwood & Jantzi, 2008; Urick & Bowers, 2011). These findings add to this emerging literature while also demonstrating alternate ways in which leaders decide to manage schools. These results also suggest that a principal's decision of whether or not to share leadership with teachers can partially be explained by the school context and a principal's background.

Principal Background and School Context

School context helped to define the ways in which principals viewed their leadership. The interpretation of the principal types and the significant school and principal context demonstrated that principal direct their leadership based on these characteristics (see Glasman & Heck, 1992; Leithwood & Jantzi, 2008; Leithwood et al., 2007; Portin et al., 2009; Spillane, 2006). This confirms contingency theory perspectives which state that based on the situation, such as the task to be accomplished, and the composition of the group to perform the task, a leader selects leadership styles to adopt (Fiedler, 1964; 1966; 1967). Principal background and school characteristics influence a principal's leadership behavior in a different way (Goldring, Huff, May & Camburn, 2007; Glasman & Heck, 1992; Hallinger & Murphy, 1986; Krüger, Witziers & Sleegers, 2007; Mayrowetz, Murphy, Louis & Smylie, 2007).

Integrating principals reported a higher number of faculty teaching to high academic standards and lower social disorder. These principals built a positive academic climate around high standards with fewer disciplinary issues. Further, *Integrating* principals were most often

female (Shakeshaft, 1993), in medium enrollment elementary schools, and more often met state or district accountability goals. *Balkanizing* principals were in small, rural, secondary schools with fewer minority students and less often had and met state or district goals. This small, secondary school context may have prompted the principal to cede leadership to teachers since they may have more training as content area experts compared to elementary school teachers, and there are fewer teachers to rally around a common school mission.

In contrast, *Controlling* principals had less principal experience and were from large schools with more minority students which less often had and met state or district goals. With a lack of experience and a larger school, these principals were inclined to centralize school leadership. Miller and Rowan (2006) argue that more organic forms of leadership, such as shared instructional leadership, does not always influence an increase in student achievement. Future research should test a mediated (Hallinger & Heck, 1996) model of leadership and school and teacher conditions to examine whether or not these types of principals influence student success.

Principal Types and Teacher Attrition

Finally, for the first time, this study tested the influence of different types of U.S. principals on teacher attrition and their occupation status the following year. In previous literature, intent to leave or other attitudinal variables related to teacher attrition have been utilized as outcomes instead of the actual event of teachers leaving a school or the profession the following year. These findings were somewhat counterintuitive. Teachers with *Integrating* principals more often left the profession or moved schools. This result is surprising since *Integrating* principals reported the highest number of teachers who taught to high standards. However, this model does not explain which types of teachers are leaving these principals. Results of the subsequent models show that the teachers who most likely leave these principals

are mainly teachers who perceived that they experienced less principal and teacher leadership or had a more negative response about school leadership.

These findings extend current conceptualizations of teacher satisfaction from literal constructs of job and organization satisfaction to general items of teacher perception about their school environment. I suggest that teacher perception of leadership is a measure of satisfaction. Previous research has established a strong relationship between teacher perceptions of leadership and teacher satisfaction (e.g. Bogler, 2001). I conclude that these measures are related because teachers conflate their view of leadership with their degree of satisfaction. However, the reasons for this strong relationship have rarely been investigated. This study as well as emerging research (Goldring *et al.*, 2012) has recently begun to further examine this overlap to better understand what teacher perceptions of leadership measure.

While the frame of this study suggests that leaders who effectively increase achievement, also effectively retain teachers through building capacity and community, the other side of the argument, the need for teacher attrition, might also be considered. In some cases, teacher turnover might allow principals to hire teachers who are a better fit. The results of this study showed that teachers more often left *Integrating* principals. This might provide evidence that *Integrating* principals, those who responded that they practice the idealized leadership (Marks & Printy, 2003; Robinson, Lloyd & Rowe, 2008), might be successful at filtering out incongruent perceptions or teachers with low perceptions of the principal and school leadership from the school environment. While frequent turnover may prevent a principal from building capacity, the infrequent or limited loss of teachers with low perceptions of leadership or the principal from schools with potentially high performing principal leaders may positively contribute to school, teacher and student outcomes. Future studies should further investigate the influence of

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incongruent teacher perceptions of leadership or possible mismatches of teacher expectations and principal behavior on teacher and student outcomes.

The interpretation of *Integrating* principals who are more likely to lose teachers as possible evidence of a human management cycle based on principal leadership and fit is further supported by the finding that teachers in schools with *Controlling* principals more often left the profession. *Controlling* principals were more likely to have teachers leave the profession rather than move schools or stay. In addition, *Controlling* principals were more likely to have former teachers who left the position of teaching but are still working in education. While there was no difference in the distribution of former teachers who left *Integrating* principals for retirement, position or occupation change, *Controlling* principals had more teachers seek a position change. This finding demonstrates that when a principal perceives their leadership as limiting teacher leadership or autonomy, teachers are more likely to leave the profession as opposed to retire or stay at their current school. These results both confirm previous literature that teacher autonomy is important for teacher satisfaction and retention and extends the current literature by identifying *Controlling* principals as a possible leadership-based reason for non-retirement teacher attrition.

The following section shifts the discussion from principal types and principal perception to teacher types and teacher perception. The teacher types help to explain which teachers are more likely to leave schools based on their perceptions of school leadership.

Contribution of Two-level Teacher Latent Class Analysis

The two-level teacher latent class analysis produced novel findings which helped to explain the types of teachers involved in school leadership and the extent that these types predict attrition. Overall, the results of this model demonstrate that teacher perceptions of leadership might be conflated with a teacher's satisfaction or fit within the school. This model extends the

literature in three main ways. First, this model defined four distinct types of teachers within school leadership. To date, this is one of the first studies to conceptualize teacher perceptions of school leadership to signify difference between teachers rather than an individual measure of an organizational effect or use as an aggregate. Second, teacher background as well as school and principal characteristics helped to define the differences across teacher types. Depending on the teacher and school context, teachers perceived leadership differently. Third, the relationship between teacher types and teacher attrition categories suggest that teacher perception of leadership represents a degree of their satisfaction with their current school.

Teacher Types

In previous literature, teacher perceptions are commonly used as an aggregate measure of school leadership at the school level, or conceptualized as reliable evaluation of school leadership or an organizational effect. On one hand, teacher perceptions have been viewed as a more reliable account, compared to the less often used principal self-reports (Leithwood & Jantzi, 2008; Urick & Bowers, 2011), of principal leadership behaviors and the degree of decision making ceded to the teachers. On the other hand, teacher perceptions of school leadership provide more information about the differences between teachers rather than the differences in school leadership. Just as principal perceptions of their own leadership and teacher leadership change according to their chosen set of behaviors or styles, teacher perceptions of principal and teacher leadership would vary based on their individual experience with the principal and the degree of influence provided to them. These differences in individual experiences of the school leadership demonstrate a heterogeneous population, or subgroups, of teachers within school leadership. The results of the latent class analysis demonstrated that there

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are four heterogeneous groups, or types, of teachers based on these perceptions, *Transitioned*, *Integrated*, *Limited* and *Balkanized* teachers.

These teacher types show that differences in teachers' individual experiences of leadership did not reflect a separation based on previous theoretically distinct leadership styles, transactional, transformational and instructional leadership. Instead, teacher perception of leadership demonstrated that leadership is multidimensional with principals and teachers enacting several of these theoretically distinct leadership styles at one time. For example, *Integrated* teachers responded that their principals most frequently practiced transactional, transformational and instructional leadership. In addition, *Integrated* teachers reported that they had the most influence over transactional as well as instructional leadership in the school and classroom. This high teacher type mirrors previous conceptualizations of idealized leadership, high transformational and high shared instructional, termed *integrated* by Marks & Printy (2003). In contrast, *Limited* teachers reported a low degree of principal and teacher leadership across all leadership styles. These teachers experienced less school leadership which has previously been discussed as *laissez faire* (Bass, 1985), simply a lack of leadership, or these teachers were dissatisfied with the degree of principal leadership experienced and the amount of influence provided to them. While these two teacher types show the multidimensionality of leadership in their experiences with no differences based on distinctions between leadership styles, *Transitioned* and *Balkanized* teachers were mid-level responder groups with more specific differences.

The majority of previous literature has focused on the identification of effective leadership behaviors or styles (e.g. Robinson, Lloyd & Rowe, 2008) rather than possible differences in the enactment of these idealized leadership behaviors. *Transitioned* and

Balkanized teachers, mid-level responders compared to *Integrated* and *Limited* teachers, demonstrate some of these variations of the ways in which leadership behaviors, found effective in previous studies or idealized, were experienced. For instance, *Transitioned* teachers experienced a relatively high frequency of principal transactional, transformational and instructional leadership. However, compared to responses about their principals, *Transitioned* teachers reported a lesser degree of teacher leadership. In contrast, *Balkanized* teachers experienced relatively low principal transactional, transformational and instructional leadership, yet high classroom autonomy. The experiences of these mid-responder teacher types provides additional information about the variations of teacher experiences of idealized principal behavior for use in future studies on the development of high shared instructional leadership, or integrated leadership, in schools.

Teacher Background and School Context

Teachers perceived school leadership differently based on their own background as well as school and principal characteristics. Teacher background best defined differences between *Transitioned* teachers, mid-high responders, and *Integrated* teachers, high responders. Compared to *Transitioned* teachers, *Integrated* teachers were less often female and more often Hispanic, African American, or Asian. These findings demonstrated that males and minority teachers more often experienced high teacher leadership since the main difference between *Integrated* and *Transitioned* teachers was a greater degree of teacher influence over the school and classroom decisions. Overall, when comparing *Transitioned* and *Integrated* teachers, male and minority teachers experienced more teacher leadership, and in turn, might be more satisfied with the degree of influence provided to them from their principal. These results show that when

simultaneously controlling for principal and school context, minority teachers more often respond that they are in schools with a greater degree of integrated, or idealized, leadership.

The relationship between school and principal characteristics and teacher types described a school environment in which the teachers are most likely to perceive school leadership in a particular way. Rural, small enrollment, secondary schools with fewer minority students and African American principals were more likely to have *Integrated* teachers that experienced an increased degree of principal and teacher leadership. Rural, large and extra-large enrollment, secondary schools that less often met state and district goals and more often male, African American and Hispanic principals were more likely to have *Balkanized* teachers who experienced less principal leadership and more classroom autonomy. Schools with more minority students and more often male and African American principals were more likely to have *Limited* teachers who experienced less principal and teacher leadership. Suburban, elementary schools were more likely to have *Transitioned* teachers who experienced high principal leadership and a relatively mid-range degree of teacher leadership.

The structural characteristics of the schools such as school size and grade level exemplifies the teacher experiences with school leadership, such as teachers in rural, small school perceiving more principal and teacher leadership or teachers in large, secondary schools perceiving less principal leadership and more teacher leadership or departmentalization. Future research should examine the significant relationships between principal ethnicity and teacher types, or teacher perceptions of leadership, since an analysis of the distribution of principal and teacher ethnicity across schools (e.g. Fairchild *et al.*, 2012) and the relationship between race and perceptions of leadership (e.g. Banks, 1995; Brown, 2005) were beyond the scope of this study.

Overall, school characteristics and teacher background help to identify the ways in which teachers most likely experience school leadership.

Teacher Types and Teacher Attrition

The relationship between teacher types and teacher attrition categories of stayers, movers and leavers demonstrated that teacher perceptions of leadership might be conflated with a degree of their satisfaction with the principal or a view of their fit within the school. Compared to *Transitioned* teachers, mid-high responders, *Integrated* teachers, high responders, were more likely to stay at their current school. *Limited* teachers, low responders, were more likely to move schools or leave the teaching profession. *Balkanized* teachers, who experienced low principal leadership and high classroom autonomy, were more likely to leave the teaching profession. *Transitioned* teachers were less likely to move schools or leave teaching compared to *Limited* and *Balkanized*, low to mid-low responders, but more likely to move schools or leave compared to *Integrated* teachers. These results show that teacher perception of school leadership help to predict teacher attrition. Further, the different types of teachers based on these perceptions help to identify who will stay, move or leave the following year. In previous studies, the relationship between teacher perceptions of leadership and teacher satisfaction, commitment and intent to leave has been well established (Bogler, 2001). These findings confirm literature--as the agreement or satisfaction with the frequency or degree of school leadership increases the likelihood that they will stay at their current school also increases. These findings extend current literature by demonstrating that teacher perception of leadership is a direct predictor of the actual event of teacher attrition, as opposed to attitudinal proxies, and defines different subpopulations, types, of teachers based on their level of experience or satisfaction with school leadership to help predict who will leave the following year.

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Contribution of Two-level Principal and Teacher Latent Class Analysis

The two-level principal and teacher latent class analysis has three main findings. First, the results show the ways in which principal types change when simultaneously accounting for teacher and principal perception. Second, this model demonstrates the ways in which teacher types group within the principal types. Third, for each teacher type in a school with a particular principal type, the findings indicate the likelihood for a teacher type with a principal type to stay, move school or leave the profession the following year. For the first time, this analysis of school leadership represents the theorized two-way relationship among principals and teachers (Rost, 1993) and defines types of teachers and types of principals in school leadership based on the interactions of their perceptions while controlling for context (Spillane, 2005). While the description of principal and teacher typologies in school leadership extends the current literature, this final two-level model also provides evidence about the appropriate use and conceptualization of principal and teacher perceptions of leadership for future studies. Finally, the relationship between types of teachers in schools with a type of principal and teacher attrition provides evidence to help inform current debates on issues of high teacher turnover (e.g. Boyd *et al*., 2005) versus acceptable teacher turnover (e.g. Harris & Adams, 2007).

Adjusted Principal Types

In this final analysis, the teacher and principal perception survey items were random, or allowed to interact, which simulated a two-way relationship between principal and teacher. The teacher types remained the same while the principal types changed. For principal leadership in principal types, *Balkanizing* and *Integrating* principals had a similar description compared to the principal only model. However, all of the *Integrating* principals now responded that professional development is provided at least once a week or more. When accounting for teacher perception,

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the third type of principal, now *Transitioning*, has a new interpretation. *Transitioning* principals were similar to *Controlling* principals in the principal only model with the exception of more frequent transactional leadership and now all responded that they did not provide professional development once a week. Interestingly, although a group of principals viewed themselves as *Controlling* in the principal perception only model, giving limited influence to the teachers, when accounting for teacher perception, all principal types now provided relatively high influence to the teachers over school and classroom decisions.

Principal perception of principal leadership remained somewhat consistent with the exception of the amount of professional development provided. However, principal perception of teacher leadership shifted with all types perceiving teacher leadership as high when accounting for teacher perception. This finding suggests that while principal perceptions may be substantially accurate for their own leadership tasks, teacher perceptions may better account for the amount of teacher leadership within the school. From these findings, I propose two important considerations when utilizing principal and teacher perception in future research. First, teacher perceptions of the professional development provided and the degree of teacher leadership is perhaps necessary for more accurate measures of these behaviors within school leadership. Second, principal perception of their own leadership is a meaningful and valid measure since it did not substantially change interpretations when accounting for teachers. Principal perception versus teacher perception of principal leadership may better account for differences between schools in principal behavior.

These results are further exemplified when plotting the relationship between transformational and shared instructional leadership (Marks & Printy, 2003) for each of the new principal types. In the principal only model on this graph, there were two relatively low principal

types, *Balkanizing*, low transformational leadership, and *Controlling*, low shared instructional leadership and one high group, *Integrating*. In this final model with the teacher perception adjusted principal types, *Balkanizing* principals remain the same, and there are now two relatively high groups, *Transitioning* and *Integrating*. *Transitioning* has less transformational leadership compared to *Integrating*, but both have relatively high shared instructional leadership. However, the variation within the types decreased on transformational leadership and the variation in the groups increased for shared instructional leadership. This shows that the principal types more accurately described transformational leadership, a measure of principal leadership, and less accurately described shared instructional leadership, a measure that included teacher leadership. This suggests that there is high variation within schools for teacher leadership so instead of teacher leadership describing between school variance it is possibly a better measure of the within variance, or at the teacher level.

Relationship between Adjusted Principal Types and Teacher Types

The distinction between principal and teacher perceptions as measures of school leadership has rarely been discussed (Leithwood & Jantzi, 2008; Urick & Bowers, 2011). Aggregates of teacher perceptions of leadership are commonly used at the school level. So far, the findings of this study demonstrate that principal perception may be a more accurate measure of principal leadership, and teacher perception of teacher leadership is a measure of within school, or teacher, variation not necessarily an organizational effect. The relationship between teacher types and principal types or the frequency that a particular teacher type groups within a principal type provides additional explanation. The distribution of teacher types into principal types were not as distinct as expected. *Balkanizing* principals had significantly more *Balkanized* teachers, which shows a congruency in their perceptions of the school leadership. *Transitioning*

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principals and *Integrating* principals had significantly more *Transitioned* teachers, mid-high

responders, which also show some congruency in their perceptions of the school leadership.

This result demonstrates that regardless of the principal type some teachers will respond

more positively about their experience with principal and teacher leadership and some teachers

will respond more negatively about their experience with principal and teacher leadership. This

provides further evidence that teacher perceptions of leadership, while a preferred measure of the

degree of teacher leadership in previous literature, is representative of a degree of their

satisfaction of school leadership or the principal (Goldring *et al*., 2012).

Teacher, School and Principal Background

The principal and teacher types included in this model were also controlled by teacher,

school and principal characteristics, which help to define the interpretation of these types with

both perceptions included. Unlike the two-level teacher latent class analysis, principal and school

characteristics were not a direct control on teacher types. Rather, they were mediated through the

principal types. Because of this, the significant teacher background variables for each teacher

types changed. When not directly controlling for the school context, *Limited* teachers were more

often male, Hispanic and African American. In the teacher only model, with school context as a

direct control, males, Hispanic and African American teachers were more often high responders

as opposed to low responders. This substantive difference in findings when directly controlling

for school context and not directly controlling for school context demonstrates a possible

relationship between the school context and teacher ethnicity on these teacher types.

In this final model, since the principal types shifted, the relationship between school and

principal characteristics and principal types changed. When accounting for teacher perception in

the model, *Integrating* principals were less often in elementary schools. The characteristics of

Transitioning and *Integrating* principals, mid-high and high responders, were similar. Both principals were more often found in schools with more minority students, in schools that more often met district or state goals and more often were female. Unique to this adjusted model based on the two-way interaction of perception among principals and teachers, *Integrating* principals more often had at least a year of education beyond their Master's degree and more experience as a principal. This finding shows a significant relationship between advanced graduate education as well as principal experience and *Integrating* principals, those with the highest degree of principal and teacher leadership in their school. Future research should investigate the extent that advanced graduate education and principal experience influence school effectiveness measures through perceptions of leadership or principal and teacher types. Perceptions of leadership or principal and teacher types used as mediating factors between advanced graduate education and school effectiveness measures would extent current findings. A dearth of literature has been able to demonstrate a direct, strong relationship between a principal's graduate education and an increase in school effectiveness (e.g. White & Bowers, 2011).

Teacher Types in Adjusted Principal Types and Teacher Attrition

To date, no study has examined the relationship between principal and teacher types in school leadership and teacher attrition using a nationally representative sample of teachers in U.S. schools. The results of teacher types on stayer, mover and leaver categories showed that lower responders, possibly less satisfied, *Balkanizing* and *Limited*, teachers were more likely to move schools or leave the profession. The *Integrated* teachers, or high responders or most satisfied, were more likely to stay. These findings were consistent with the previous models.

Finally, the overall purpose of this study and final model was to better understand which teachers with which principals were more or less likely to leave the teaching profession. In

general, the results demonstrate that low responders, *Balkanized* and *Limited* teachers, regardless of the principal type in their school, were more likely to leave teaching as a profession. This supports the conclusion that teacher perception of leadership, or teacher types, are a measure of their satisfaction rather than the leadership within the school. This same conclusion was drawn when interpreting the changes to the principal types in this model. Teacher perception did not shift the degree of principal leadership at the school level. Teacher types or teacher perception is an indication of their individual experience of the principal and teacher leadership in the school which demonstrates their level of satisfaction, which ultimately predicts whether or not they will leave the following year. Future studies should use teacher perception of school leadership as a measure of the variance between teachers rather than an organizational or leadership effect.

There were two unique findings for the teacher types who were in schools with *Integrating* principals. First, *Integrated* teachers with *Integrating* principals were less likely to move schools. This finding confirms the main hypothesis of this study which was that *Integrating* principals, or the idealized school leader type, were more likely to have teachers stay. This result showed that, more specifically, the high responders or most satisfied teachers stayed with the *Integrating* principals. While *Balkanized* and *Limited* teachers were more likely to leave *Integrating* principals, the *Integrated* teachers were more likely to stay.

Second, *Transitioned* teachers, mid-high responders, were more likely to leave *Integrating* principals. There are a couple possible explanations for this finding. On one hand, *Integrating* principals had the most *Transitioned* teachers. Further, the likelihood of these teachers leaving was compared to *Transitioned* teachers with *Balkanizing* principals, and *Balkanizing* principals had the fewest *Transitioned* teachers. It may have been a leadership effect based on the likelihood of these teachers to group with *Integrating* principals. On the other hand,

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the *Transitioned* teachers and *Integrating* principals had similar perceptions of the leadership within the school. So regardless of relatively high principal and teacher leadership, these teachers still chose to leave the teaching profession. This finding might demonstrate that further investigation into the types of principals and teachers in school leadership help to identify teachers who unexpectedly leave teaching. Further studies should examine different types of teacher leavers to better understand why teachers who experience a positive school environment choose to leave their position.

Despite similar perceptions of frequent leadership between these teachers and their principal, *Transitioned* teachers with *Integrating* principals left the profession and cited dissatisfaction as a reason. These teachers had an average of twelve years of experience and did not match any of the other characteristics of traditional leavers (see Guarino *et al.*, 2006). The use of a school leadership typology framework in future teacher attrition research may help to identify non-traditional teacher leavers, who left from dissatisfaction with the profession, but were provided with necessary support as well as autonomy.

The pattern of teacher leavers from the principal types show that all principal types most often lose their lower responding, or more dissatisfied, teacher types, which were randomly distributed across all principal types, except for *Balkanized* teacher who were more often with *Balkanizing* principals. The high responding teachers, or more satisfied teachers, more often stay in schools with the idealized leader, *Integrating* principals. These results have three possible interpretations. First, seemingly, it appears as though all principals filter more dissatisfied teachers out of teaching, and the high, idealized principals retain the highly satisfied teachers. This pattern of teacher attrition by teacher types in principal types might represent a necessary human management of teachers. Principals might be good at allowing dissatisfied teachers to

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leave, and the idealized principals retain the highly satisfied teachers. This would confirm and extend the teacher attrition literature that contests that teacher turnover is an issue (Harris & Adams).

Second, since teachers perceive and experience leadership differently in schools with the same principal type, an incongruence of teacher and principal perception or an actual lack of support and autonomy (Guarino, 2006) could be influencing these teachers to leave. Principals may not be able to offer enough support and autonomy to all of their teachers. This interpretation supports previous findings about the importance of support and autonomy for teacher satisfaction (Bogler, 2001) and retention (Ingersoll, 2001).

Third, school and teacher context may have a greater influence on the teacher types or teacher perception compared the leadership provided in the school. When directly controlling for school context, minority teachers were more likely related to the *Integrated* teachers or the high, satisfied responders. When school context was mediated through the principal types, minority teachers were more likely related to the *Limited* teachers or the low, dissatisfied responders. Future work should study the relationship between school context, teacher ethnicity and perceptions of leadership.

Summary of Contributions

In conclusion, the results of this dissertation study extend the current literature in four main ways. First, this typology of principals and teachers in school leadership demonstrates that leadership is multidimensional. Leaders practice variations of idealized leadership behaviors simultaneously. Previous research has limited the study of this multidimensionality to the positive relationships between leadership styles (Bogler, 2001; Bass, 1985; Marks & Printy, 2003). Current distinctions between leadership styles do not reflect the differences in leaders

across the U.S. In future research, more attention should be given to leaders who only practice some of the idealized leadership behaviors, or the mid-range principals, in order to better understand how more effective forms of leadership, such as shared instructional leadership are developed in schools.

Second, teacher and principal perceptions of leadership are distinct measures. Teacher perception of leadership is a more accurate measure of teacher leadership and may be conflated with their satisfaction with their principal and school, which both signify differences at the teacher level. Principal perception of leadership captures principal leadership behavior at the school level. Although there is a growing body of literature that demonstrates the importance of principal perception (Leithwood & Jantzi, 2008; Urick & Bowers, 2011), the differences between perceptions have rarely been explored. Since a main purpose of leadership is to influence stakeholder perceptions (Rost, 1993), the study of the relationship between principal and teacher perceptions will provide evidence about the development of organizational effects on teachers.

Third, school structural characteristics, such as size and grade level, best defined differences between the principal and teacher types (Louis *et al., 2010;* Rowan, 1990). In addition, the idealized principal type, *Integrating*, had more principal experience and more often advanced graduate education. However, principal types did not seem to successfully mediate the influence of school characteristics on teacher perceptions. The likelihood of teachers with particular background characteristics to be in a particular teacher type substantially changes when directly controlling for school characteristics compared to the principal types mediating the school context. This finding demonstrates the importance of the relationship between school context and teacher background on perceptions of leadership and, ultimately, teacher retention.

This result exemplifies the value in research that helps to describe the distribution of student and teacher backgrounds across schools (e.g. Fairchild *et al*., 2012) and the relationships between race and leadership (e.g. Brown, 2005; Tillman, 2005).

Fourth, teachers who responded that there was a lower degree of principal and teacher leadership, or who seemed more dissatisfied, were more likely to leave the school or profession regardless of the principal type. At the same time, *Integrating* principals were able to most often retain the *Integrated* teachers, or higher responders. This study provided a novel, comprehensive investigation of the types of principals and teachers in school leadership across U.S. schools and the extent that these types predict teacher attrition.

Limitations

I recognize that this analysis was limited in the following ways. I used the 1999-2000 SASS because it provided a unique opportunity to test theory using nationally representative data. Although I was able to include the most current conceptualizations of leadership, this data is over ten years old at the time of this writing. Future studies should use more recent data to confirm these results**.** Since the passing of No Child Left Behind in 2001, the accountability climate in schools has changed. While many states and districts already had accountability systems in place, this increase in academic standards and change in teaching responsibilities may shift the perception of school leadership and, in turn, the membership across types. I attempted to account for the changing accountability context by including the variable, have and met state or district goals.

In addition, no other studies have demonstrated how principal and teacher perceptions of leadership group into types using nationally representative data. Bauer and Curan (2003) argue that types produced from mixture models may not be representative of different populations

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within the data. I recognize that there is misspecification across membership classifications and that the latent class analysis is dependent on the heterogeneity across responses to survey items rather than heterogeneity across possible subpopulations. Finally, the number of principal and teacher classes for the final model was set *a priori* based on the results of the previous single LCA models. This within and between latent class analysis with survey indicators at both teacher and principal levels did not allow for a test of model fit, Lo-Mendell-Rubin (LMR). While this final analysis allows for a direct comparison with the previous single LCAs, there was not a statistical test that indicates whether or not the number of principal classes and teacher classes are appropriate for the data with this model specification.

Implications for Practice

This study has three main implications for practitioners. First, whether or not a principal is leading a secondary or elementary school, both principal leadership and teacher leadership are important. This study confirmed that high transformational leadership is necessary in order to build shared instructional leadership. This finding is most important for secondary principals of large enrollment schools who may gravitate toward *Balkanized* behaviors. The creation and maintenance of centralized leadership in these schools will provide more support for teachers and may reduce teacher turnover. Second, all principals regardless of context should be aware of which teachers feel as though they experience less principal leadership. These teachers are more likely to leave the school or the profession. If these teachers are incorporated into the school's leadership through support systems and ceded influence, and begin to develop a more congruent perception of leadership practices within the school, then they will transition into a teacher who is more likely to stay. Third, principals should become aware of how to practice effective leadership, *Integrated* behaviors, in addition to how to influence the perceptions of teachers

about their leadership practices. More graduate education and experience may lead to an increased proficiency in the ability to produce this organizational effect or influence on teacher perceptions. Principals as well as educational leadership programs would benefit from a focus on both the development of effective leadership practice and the influence of teacher perceptions or fit. The congruency between principal and teacher perceptions of effective leadership will lead to an increase in teacher retention.

Future Research

Moving forward, the guiding question should be: In what ways have principals *developed* positive environments for teachers? There has been much attention given to distributed leadership and the influence of autonomy or distributed leadership on teacher satisfaction, empowerment, engagement, etc. The majority of this research has focused on finding effective leadership behaviors. Now that we better understand the behaviors that constitute effective leadership, these measures can be used to test how principals develop these practices in schools. The application of mixture models, such as latent class analysis or growth mixture models, to school leadership data provides evidence of the heterogeneity in leadership practices. These models can begin to reveal not only how leaders have differed, but, more specifically, possible stages toward leadership effectiveness within their particular context. This would provide educators and policymakers with a better understanding of appropriate training, timelines for improvements and evaluations.

TITLE: PRINCIPAL LCA

DATA: FILE = N:\...dat;

VARIABLE: NAMES =
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        rA0199 rA0200 rA0201 rA0202 rA0203
        rA0204 rA0205 rA0206

        A0173 SOCDIS
        rA0081 rA0089 rA0097 rA0105 rA0112
        rA0119 rA0127

        URBAN RURAL
        SMALL LARGE EXLARGE ELEM
        K12FRPL MINENR STUTCH
        METGOAL FEMALE ASIAN BLACK HISPAN
        BEYMAST PRNEXPER TCHEXPER
        SCHWGT CLUS;

    MISSING = ALL (9999.00);
    IDVARIABLE = CLUS;
    WEIGHT = SCHWGT;
    USEVARIABLES =

        URBAN RURAL
        SMALL LARGE EXLARGE ELEM
        K12FRPL MINENR STUTCH
        METGOAL FEMALE ASIAN BLACK HISPAN
        BEYMAST PRNEXPER TCHEXPER A0173 SOCDIS
        rA0081 rA0089 rA0097 rA0105 rA0112
        rA0119 rA0127 rA0163 rA0197 rA0198
        rA0199 rA0200 rA0201 rA0202 rA0203
        rA0204 rA0205 rA0206;

    CLASSES = c(3);

    CATEGORICAL = rA0163 rA0197 rA0198
      rA0199 rA0200 rA0201 rA0202 rA0203
      rA0204 rA0205 rA0206;

ANALYSIS: TYPE = MIXTURE;

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        STARTS = 500 50;
        STITERATIONS = 20;


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    %OVERALL%

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        SMALL LARGE EXLARGE ELEM
        K12FRPL MINENR STUTCH
        METGOAL FEMALE ASIAN BLACK HISPAN
        BEYMAST PRNEXPER TCHEXPER;

OUTPUT:   SAMPSTAT STANDARDIZED TECH1 TECH4 TECH7 TECH11 TECH12;


PLOT:
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       rA0199 rA0200 rA0201 rA0202 rA0203
       rA0204 rA0205 rA0206(*);


SAVEDATA:   SAVE = CPROBABILITIES;
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TITLE: TWO LEVEL TEACHER LCA

DATA: FILE = N:\...dat;

VARIABLE: NAMES = CNTLNUM TFNLWGT
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                rT0178 T0273 planning
                rT0286-rT0312 rT0314-rT0317
                salary TFEMALE rATTRIT TIEP TLEP
                THISPANC TBLACK TASIAN
                TSTUTCH YRTCHSC TSMALL TMEDIUM TLARGE TEXLARG
                TPCTELIG TURBAN TSUBURBA TRURAL
                TMINENR TMINTCH TELEM TMIDDLE THS TCOMBIN
                SCHCNTL CLUS PCNTLNU AFNLWGT URBAN RURAL
                SMALL LARGE EXLARGE ELEM IEP
                LEP K12FRPL MINENR MINTCH STUTCH
                METGOAL FEMALE ASIAN BLACK HISPAN
                BEYMAST PRNEXPER TCHEXPER A0173 SOCDIS
                rA0081 rA0089 rA0097 rA0105 rA0112
                rA0119 rA0127 rA0163 rA0197 rA0198
                rA0199 rA0200 rA0201 rA0202 rA0203
                rA0204 rA0205 rA0206 SCHWGT;

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            IDVARIABLE = CNTLNUM;
            WEIGHT = TFNLWGT;
            BWEIGHT = SCHWGT;
            USEVARIABLES =
                rT0178 T0273 planning
                rT0286-rT0312 rT0314-rT0317

             T0065 rT0080

            salary TFEMALE
            THISPANC TBLACK TASIAN

            URBAN RURAL SMALL LARGE EXLARGE ELEM
            K12FRPL MINENR STUTCH
            METGOAL FEMALE ASIAN BLACK HISPAN BEYMAST
            PRNEXPER TCHEXPER;

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            rT0300 rT0301 rT0302 rT0303 rT0304 rT0305
            rT0306 rT0307 rT0308 rT0309 rT0310 rT0311
            rT0312 rT0314 rT0315 rT0316 rT0317;

        WITHIN = rT0178 T0273 planning
            rT0286-rT0312 rT0314-rT0317


          T0065 rT0080

          salary TFEMALE
          THISPANC TBLACK TASIAN;

        BETWEEN = URBAN RURAL SMALL LARGE EXLARGE ELEM
            K12FRPL MINENR STUTCH
            METGOAL FEMALE ASIAN BLACK HISPAN BEYMAST
            PRNEXPER TCHEXPER;

        CLUSTER = CLUS;

ANALYSIS:     TYPE = TWOLEVEL MIXTURE;
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        STARTS = 500 50;
        STITERATIONS = 20;



MODEL:     %WITHIN%
        %OVERALL%

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        %BETWEEN%
        %OVERALL%
        C#1-C#3 ON URBAN RURAL SMALL LARGE EXLARGE ELEM
            K12FRPL MINENR STUTCH
            METGOAL FEMALE ASIAN BLACK HISPAN BEYMAST
            PRNEXPER TCHEXPER;



OUTPUT:    SAMPSTAT STANDARDIZED TECH1 TECH4 TECH7 TECH11 TECH12;
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PLOT:
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                rT0306 rT0307 rT0308 rT0309 rT0310 rT0311
                rT0312 rT0314 rT0315 rT0316 rT0317(*);


SAVEDATA:    SAVE = CPROBABILITIES;
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        FORMAT IS FREE;
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APPENDIX C

TITLE: TWO LEVEL PRINCIPALS AND TEACHERS LCA

DATA: FILE = N:\...dat;

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              rT0178 T0273 planning
              rT0286-rT0312 rT0314-rT0317
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              THISPANC TBLACK TASIAN
              TSTUTCH YRTCHSC TSMALL TMEDIUM TLARGE TEXLARG
              TPCTELIG TURBAN TSUBURBA TRURAL
              TMINENR TMINTCH TELEM TMIDDLE THS TCOMBIN
              SCHCNTL CLUS PCNTLNU AFNLWGT URBAN RURAL
              SMALL LARGE EXLARGE ELEM IEP
              LEP K12FRPL MINENR MINTCH STUTCH
              METGOAL FEMALE ASIAN BLACK HISPAN
              BEYMAST PRNEXPER TCHEXPER A0173 SOCDIS
              rA0081 rA0089 rA0097 rA0105 rA0112
              rA0119 rA0127 rA0163 rA0197 rA0198
              rA0199 rA0200 rA0201 rA0202 rA0203
              rA0204 rA0205 rA0206 SCHWGT;

              MISSING = ALL (9999 9999.00);
              IDVARIABLE = CNTLNUM;
              WEIGHT = TFNLWGT;
              BWEIGHT = SCHWGT;

              USEVARIABLES = rT0178 T0273 planning
                    rT0286-rT0298
                    rT0299-rT0312
                    rT0314-rT0317
                    A0173 SOCDIS
                    rA0081 rA0089 rA0097 rA0105 rA0112
                    rA0119 rA0127 rA0163
                    rA0197-rA0206
                    T0065 rT0080 salary TFEMALE
                    THISPANC TBLACK TASIAN
                    URBAN RURAL SMALL LARGE EXLARGE ELEM
                    K12FRPL MINENR STUTCH
                    METGOAL FEMALE ASIAN BLACK HISPAN BEYMAST
                    PRNEXPER TCHEXPER;
              CATEGORICAL = rT0299-rT0312 rT0314-rT0317 rA0163 rA0197-rA0206;

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            TBLACK TASIAN
            rT0178 T0273 planning
            rT0286-rT0298
            rT0299-rT0312
            rT0314-rT0317;
        BETWEEN = cb URBAN RURAL SMALL LARGE EXLARGE ELEM K12FRPL
            MINENR STUTCH
            METGOAL FEMALE ASIAN BLACK HISPAN BEYMAST
            PRNEXPER TCHEXPER
            A0173 SOCDIS
            rA0081 rA0089 rA0097 rA0105 rA0112
            rA0119 rA0127 rA0163
            rA0197-rA0206;
        CLUSTER = CLUS;

ANALYSIS:   TYPE = TWOLEVEL MIXTURE;
        PROCESSORS = 8 (STARTS);
        MITERATION = 500;
        STARTS = 5000 500;
        STITERATIONS = 20;

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        %OVERALL%
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        %BETWEEN%
        %OVERALL%
        cb on URBAN RURAL SMALL LARGE EXLARGE ELEM K12FRPL MINENR
            STUTCH METGOAL
            FEMALE ASIAN BLACK HISPAN BEYMAST PRNEXPER TCHEXPER;
        cw#1-cw#3 on cb;

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        [rT0314$1-rT0317$1];
        [rT0178 T0273 planning];
        [rT0286-rT0298];
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        [rT0299$1-rT0312$1];
        [rT0314$1-rT0317$1];
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        [rT0286-rT0298];
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        [rT0286-rT0298];
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        [rT0314$1-rT0317$1];
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        [rT0286-rT0298];

MODEL cb:   %BETWEEN%
        %cb#1%
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        [rA0197$1-rA0206$1];
        [A0173 SOCDIS];
        [rA0081 rA0089 rA0097 rA0105 rA0112];
        [rA0119 rA0127];
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        [rA0163$1];
        [rA0197$1-rA0206$1];
        [A0173 SOCDIS];
        [rA0081 rA0089 rA0097 rA0105 rA0112];
        [rA0119 rA0127];
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        [rA0197$1-rA0206$1];
        [A0173 SOCDIS];
        [rA0081 rA0089 rA0097 rA0105 rA0112];
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SAVEDATA:  SAVE = CPROBABILITIES;
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Principal latent class analysis: Means, standard deviations and ANOVA or Chi Square of principal perception of principal leadership disaggregated by latent class

Variable	Controlling (24%)	Balkanizing (22%)	Integrating (54%)	F or χ^2
Transactional Leadership				
Percent of teachers teaching to high academic standards	74.81_a (21.07)	77.60_b (17.85)	84.04_c (15.66)	189.71 ***
Principal perception of social disorder	0.76_b (0.47)	0.77_b (0.47)	0.65_a (0.41)	60.32 ***
Maintain physical security	0.96_b (0.20)	0.83_a (0.38)	0.99_c (0.09)	631.31 ***
Manage school facilities	0.95_b (0.22)	0.85_a (0.35)	0.99_c (0.11)	427.83 ***
Supervise staff	0.87_b (0.33)	0.60_a (0.49)	0.92_c (0.27)	901.96 ***
Attend district meetings	0.53_b (0.50)	0.45_a (0.50)	0.61_c (0.49)	129.22 ***
Transformational Leadership				
Attend prof dev with teachers	0.90_b (0.30)	0.83_a (0.37)	0.94_c (0.24)	153.96 ***
Develop public relations	0.75_b (0.43)	0.44_a (0.50)	0.90_c (0.31)	1301.56 ***
Facilitate achvmnt of school mission	0.75_b (0.44)	0.32_a (0.47)	0.87_c (0.33)	1752.94 ***
Build professional community	0.66_b (0.47)	0.28_a (0.45)	0.85_c (0.35)	1740.15 ***
Provide prof dev activities	0.35_b (0.48)	0.11_a (0.31)	0.50_c (0.50)	772.86 ***
Instructional Leadership				
Guide development of curriculum	0.69_b (0.46)	0.22_a (0.42)	0.81_c (0.39)	1751.65 ***
Facilitate student learning	0.84_b (0.37)	0.48_a (0.50)	0.96_c (0.19)	1850.38 ***

Note: Standard errors are in parentheses.
Note: Subscripts $_{a, b, c,}$ are homogeneous subsets, $_a$ = lowest.
Note: *** p < .001.

Principal latent class analysis: Means, standard deviations and ANOVA of principal perception of teacher leadership disaggregated by latent class

Variable	Controlling (24%)	Balkanizing (22%)	Integrating (54%)	F
Transactional Leadership				
Evaluation of teachers	1.34_a	2.08_b	2.29_c	363.60 ***
	(1.06)	(1.19)	(1.23)	
Hiring of teachers	1.56_a	2.25_b	2.69_c	538.26 ***
	(1.17)	(1.16)	(1.15)	
Spending	1.90_a	2.32_b	2.91_c	611.01 ***
	(1.08)	(1.00)	(0.96)	
Discipline policy	2.58_a	3.21_b	3.61_c	1132.75 ***
	(0.94)	(0.78)	(0.60)	
Instructional Leadership				
Performance standards	2.01_a	3.20_b	3.43_c	2026.25 ***
	(0.89)	(0.71)	(0.69)	
Curriculum	1.98_a	3.30_b	3.46_c	2589.11 ***
	(0.83)	(0.66)	(0.65)	
Prof dev program for teachers	2.29_a	3.10_b	3.41_c	1176.42 ***
	(0.93)	(0.76)	(0.69)	

Note: Standard errors are in parentheses.
Note: Subscripts $_{a, b, c}$ are homogeneous subsets, $_a$ = lowest.
Note: *** $p < .001$.

Two-level teacher latent class analysis: Means, standard deviations and ANOVA or Chi Square of teacher perception of principal leadership disaggregated by latent class

Variables	Transitioned (28%)	Integrated (34%)	Balkanized (26%)	Limited (12%)	F or χ^2
Transactional Leadership					
Hours in school/wk	37.04_b	36.66_a	37.25_{bc}	37.45_c	21.90 ***
	(6.22)	(7.35)	(6.11)	(5.60)	
Planning hours	3.69_a	4.06_b	4.11_b	3.70_a	61.41 ***
	(2.43)	(2.66)	(2.55)	(2.44)	
Satisfied with salary	0.34_c	0.47_d	0.31_b	0.24_a	965.99 ***
	(0.47)	(0.50)	(0.46)	(0.42)	
Misbehavior doesn't interfere	0.62_c	0.74_d	0.50_b	0.35_a	2503.58 ***
	(0.49)	(0.44)	(0.50)	(0.48)	
Teachers enforce rules	0.77_c	0.80_d	0.28_a	0.33_b	8721.43 ***
	(0.42)	(0.40)	(0.45)	(0.47)	
Principal enforces discipline	0.97_c	0.97_c	0.63_b	0.51_a	8100.91 ***
	(0.17)	(0.16)	(0.48)	(0.50)	
Adequate materials	0.79_c	0.90_d	0.69_b	0.50_a	3097.75 ***
	(0.41)	(0.30)	(0.46)	(0.50)	
Other duties don't interfere	0.25_b	0.39_c	0.26_b	0.19_a	838.59 ***
	(0.43)	(0.49)	(0.44)	(0.39)	
Support for special needs students	0.68_c	0.82_d	0.48_b	0.33_a	4574.11 ***
	(0.46)	(0.39)	(0.50)	(0.47)	
Satisfied with class size	0.70_c	0.82_d	0.66_b	0.56_a	1205.18 ***
	(0.46)	(0.39)	(0.47)	(0.50)	
Tardiness doesn't interfere	0.68_c	0.75_d	0.56_b	0.49_a	1445.18 ***
	(0.46)	(0.43)	(0.50)	(0.50)	
Transformational Leadership					
How useful- all prof dev	2.65_c	2.90_d	2.40_b	2.14_a	930.20 ***
	(0.87)	(0.84)	(0.98)	(1.01)	
Parent support	0.61_c	0.75_d	0.44_b	0.33_a	3289.63 ***
	(0.49)	(0.44)	(0.50)	(0.47)	
Principal communicates expectations	0.99_d	0.98_c	0.72_b	0.65_a	6117.40 ***
	(0.11)	(0.13)	(0.45)	(0.48)	
Colleagues share beliefs	0.94_b	0.95_b	0.68_a	0.68_a	4367.03 ***
	(0.23)	(0.23)	(0.47)	(0.47)	
Staff is cooperative	0.93_c	0.94_c	0.55_b	0.51_a	7429.54 ***
	(0.26)	(0.25)	(0.50)	(0.50)	
Administration is supportive	0.94_c	0.97_d	0.59_b	0.44_a	8850.70 ***
	(0.24)	(0.18)	(0.49)	(0.50)	
Principal communicates what kind of school	0.99_d	0.97_c	0.59_a	0.57_a	8879.70 ***
	(0.12)	(0.16)	(0.49)	(0.49)	
Staff is recognized	0.87_c	0.90_d	0.36_b	0.32_a	11400.74 ***
	(0.33)	(0.29)	(0.48)	(0.47)	
Instructional Leadership					
Coordinate content with other teachers	0.88_d	0.86_c	0.71_a	0.78_b	1229.69 ***
	(0.32)	(0.34)	(0.45)	(0.41)	
Principal discusses instructional practices	0.60_c	0.64_d	0.16_a	0.23_b	7296.36 ***
	(0.49)	(0.48)	(0.36)	(0.42)	

Note: Standard errors are in parentheses, subscripts $_{a,\ b,\ c,}$ are homogeneous subsets, $_a$ = lowest, *** $p < .001$.

APPENDIX G

Two-level teacher latent class analysis: Means, standard deviations and ANOVA of teacher perception of teacher leadership disaggregated by latent class

Variable	Transitioned (28%)	Integrated (34%)	Balkanized (26%)	Limited (12%)	F
Transactional Leadership					
Teacher influence on teacher hiring	0.78$_c$ (1.01)	1.62$_d$ (1.28)	0.69$_b$ (0.96)	0.42$_a$ (0.77)	2126.16 ***
Teacher influence on school discipline	1.63$_c$ (1.06)	2.61$_d$ (0.97)	1.23$_b$ (1.05)	0.72$_a$ (0.88)	5274.11 ***
Teacher influence on school budget	0.94$_c$ (1.03)	1.62$_d$ (1.19)	0.69$_b$ (0.95)	0.46$_a$ (0.76)	2091.68 ***
Teacher influence on teacher evaluation	0.60$_c$ (0.82)	1.43$_d$ (1.18)	0.47$_b$ (0.78)	0.33$_a$ (0.65)	2702.01 ***
Teacher control over classroom discipline	2.87$_b$ (0.83)	3.36$_c$ (0.69)	2.88$_b$ (0.96)	1.82$_a$ (1.07)	3113.39 ***
Shared Instructional Leadership					
Teacher influence on school performance standards	1.68$_b$ (1.07)	2.93$_d$ (0.90)	1.82$_c$ (1.16)	0.94$_a$ (0.96)	4878.10 ***
Teacher influence on school curriculum	1.71$_b$ (1.02)	3.13$_d$ (0.81)	2.31$_c$ (1.14)	1.05$_a$ (0.98)	5741.74 ***
Teacher influence on school prof dev content	1.73$_c$ (1.05)	2.64$_d$ (1.00)	1.48$_b$ (1.12)	0.94$_a$ (0.93)	3743.97 ***
Teacher control over classroom selection of materials	2.00$_b$ (1.09)	3.21$_d$ (0.86)	2.91$_c$ (1.04)	1.35$_a$ (1.06)	4805.50 ***
Teacher control over classroom selection of content	1.97$_b$ (1.06)	3.27$_d$ (0.78)	3.07$_c$ (0.91)	1.27$_a$ (1.02)	6837.50 ***
Teacher control over selection of technique	3.18$_b$ (0.74)	3.72$_d$ (0.49)	3.66$_c$ (0.53)	2.26$_a$ (1.06)	5717.82 ***
Teacher control over classroom student evaluation	3.30$_b$ (0.70)	3.74$_d$ (0.49)	3.68$_c$ (0.53)	2.52$_a$ (0.99)	4187.26 ***
Teacher control over classroom homework	3.32$_b$ (0.82)	3.74$_d$ (0.54)	3.70$_c$ (0.57)	2.61$_a$ (1.11)	2949.14 ***

Note: Standard errors are in parentheses.
Note: Subscripts $_{a, b, c}$ are homogeneous subsets, $_a$ = lowest.
Note: *** $p < .001$.

APPENDIX H

Two-level principal and teacher latent class analysis: Means, standard deviations and ANOVA or Chi Square of principal perception of principal leadership disaggregated by principal latent class

Variable	Principal Classes			
	Transitioning (38%)	Integrating (35%)	Balkanizing (27%)	F or χ^2
Transactional Leadership				
Percent of teachers teaching to high academic standards	81.87_b (16.72)	81.83_b (18.12)	76.63_a (19.15)	61.10 ***
Principal perception of social disorder	0.70_b (0.42)	0.66_a (0.44)	0.74_c (0.47)	16.28 ***
Maintain physical security	1.00_c (0.05)	0.98_b (0.12)	0.83_a (0.37)	738.02 ***
Manage school facilities	0.99_b (0.11)	0.98_b (0.14)	0.86_a (0.35)	471.96 ***
Supervise staff	0.93_a (0.25)	0.94_a (0.25)	0.60_b (0.49)	1213.58 ***
Attend district meetings	0.53_b (0.50)	0.67_c (0.47)	0.46_a (0.50)	215.20 ***
Transformational Leadership				
Attend prof dev with teachers	0.91_b (0.28)	0.94_c (0.24)	0.85_a (0.35)	100.18 ***
Develop public relations	0.86_b (0.34)	0.91_c (0.30)	0.44_a (0.50)	1585.11 ***
Facilitate achvment of school mission	0.85_b (0.36)	0.90_c (0.30)	0.33_a (0.47)	2111.95 ***
Build professional community	0.76_b (0.43)	0.93_c (0.26)	0.27_a (0.44)	2370.47 ***
Provide prof dev activities	0.00_a (0.00)	1.00_b (0.00)	0.14_c (0.34)	6285.91 ***
Instructional Leadership				
Guide development of curriculum	0.75_b (0.43)	0.87_c (0.33)	0.24_a (0.43)	2167.72 ***
Facilitate student learning	0.98_c (0.13)	0.97_b (0.18)	0.44_a (0.50)	2920.69 ***

Note: Standard errors are in parentheses.
Note: Subscripts $_{a, b, c}$, are homogeneous subsets, $_a$ = lowest.
Note: *** p < .001.

Two-level principal and teacher latent class analysis: Means, standard deviations and ANOVA of principal perception of teacher leadership disaggregated by principal latent class

	Principal Classes			
Variable	Transitioning (38%)	Integrating (35%)	Balkanizing (27%)	F
Transactional Leadership				
Evaluation of teachers	2.00_{ab} (1.24)	2.10_b (1.27)	1.95_a (1.22)	6.50**
Hiring of teachers	2.36_b (1.24)	2.43_b (1.25)	2.14_a (1.22)	31.31***
Spending	2.62_b (1.07)	2.66_b (1.07)	2.30_a (1.06)	77.26***
Discipline policy	3.34_b (0.79)	3.36_b (0.82)	3.08_a (0.90)	76.03***
Instructional Leadership				
Performance standards	3.10_b (0.90)	3.08_b (0.98)	2.90_a (0.98)	39.71***
Curriculum	3.07_b (0.93)	3.14_c (0.92)	3.00_a (0.93)	14.19***
Prof dev program for teachers	3.12_b (0.90)	3.15_b (0.87)	2.94_a (0.89)	36.43***

Note: Standard errors are in parentheses.
Note: Subscripts $_{a, b, c,}$ are homogeneous subsets, $_a$ = lowest.
Note: *** $p < .001$.

APPENDIX J

UTSA The University of Texas at San Antonio

Office of Research Integrity and Compliance

Notice of Approval by Expedited Review

Date: June 7, 2011   FWA 00003861

IRB#:   11-232

Study Title: "Investigating the Influence of variations in school leadership on teacher retention: A two-level latent class analysis of teacher perceptions of school leadership"

To: Angela Urick,, M.S., Department of Educational Leadership and Policy Studies
             c/o Alex Bowers, Ph.D., Faculty Sponsor

From: Judith W. Grant, Ph.D., CIP, Director, Institutional Review Board   *Judith W. Grant, Ph.D.,*

Date of Approval: June 7, 2011   **Date of Expiration: June 6, 2012**

The above referenced protocol was reviewed and approved by expedited review on behalf of the Institutional Review Board in accordance with the federal regulations (45 CFR 46 and all applicable subparts). This protocol was approved under expedited category 7.

No modifications may be made to the research plan, methodology, or any other aspect of the study without prior approval from the IRB, except in cases where changes are necessary to remove an immediate hazard to subjects. When modifications are made to eliminate an immediate hazard to subjects the IRB must be notified immediately.

If you wish to continue the research project beyond the expiration date you must submit a progress report at least three weeks before the expiration date. As a courtesy the IRB will send reminder notices; however, it is the responsibility of the investigator to submit the required information with ample time for IRB review. In addition, you are required to submit a closure report upon completion of the research project.

Additional Regulatory Findings:
  • A waiver of consent is approved under 45 CFR 46.116(d).

Should you have any questions regarding this letter, or need further assistance, please contact the IRB office at 210-458-6473 or send an email to irb@utsa.edu.

Items Approved: N/A

Study Sites: UTSA

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