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THE RELATIONSHIP BETWEEN PRINCIPALS' DISTRIBUTED LEADERSHIP AND  
TEACHER TURNOVER IN NORTH CAROLINA SCHOOLS

A Dissertation in

Educational Leadership

by

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## **ABSTRACT**

The three-fold purpose of this quantitative data study was to explore the relationship between teachers' perceptions of distributed leadership and teacher turnover in public schools in North Carolina. This study measured two latent constructs: teachers' perceptions of distributed leadership in their schools and teachers' intentions to leave their jobs. Within distributed leadership, three sub-constructs were measured: leadership function, cohesive teamwork, and participative decision-making. This study aimed to answer three research questions related to the relationship between teachers and principals' perceptions of distributed leadership; the effect of school context characteristics of the way teachers perceive leadership distributions in their schools, and the relationship between teachers' perceptions of distributed leadership and teacher turnover. Regression analysis results were based on quantitative survey data from the North Carolina Teachers Working Conditions Survey 2005–2006. Implications of the findings and suggestions for future research are provided.

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## **Chapter 1**

### **Introduction**

During the past few decades, research has shown that teachers and principals are critical to school effectiveness and school improvement (Branch, Hanushek, & Rivken, 2012; Firestone & Pennell, 1993; Knight, 2011; Rosenholtz, 1989). The literature on effective school leaders, however, contains mixed reviews of effective leadership characteristics (Harris, 2013; Leithwood, Begeley, & Cousins, 1990). These studies adopted an approach in which school leadership was a person-centered quality existing in only one person—the school principal. Thus, leadership was examined as the effect that this one person had on working conditions. Recently, the research focus has shifted from one-person-centered leadership theories to models in which school leadership is distributed across the school team (Devos, Tuytens & Hulpia, 2014; Farr & Steven, 2010; Gronn, 2002; Hulpia & Devos, 2010; Hulpia, Devos & Van Keer, 2011; Leithwood, Patten, & Jantzi, 2010; Spillane & Coldren, 2015).

Educational research has argued that school leaders should be talented and creative in developing a school mission and vision that fits with the type of education they wish students to receive. Additionally, principals have the responsibility for leading the school, which includes educating, disciplining, supervising, motivating, and providing professional development for their personnel, among other duties. In short, principals must create and maintain an adequate teaching-learning atmosphere (Coelli & Green, 2012; Davis, Kearney, & Sanders, 2011; Dhuey & Smith, 2012; Fuller & Hollingworth, 2014; Jacques, Clifford, & Hornung, 2012), and have the capacity to work well with people in order to provide a positive working environment (Leithwood, Patten & Jantzi, 2010).

Evidence suggests that a principal's leadership style has an impact on the level and quality of the fulfillment of these responsibilities within the school (e.g. Bogler, 2001; Leithwood & Jantzi, 2000, 2005). School leadership has been studied from different perspectives, ranging from a very managerial perspective that focuses mainly on instruction (Bossert, Dwyer, Rowan, & Lee, 1982; Hallinger, 1992) to a more person-focused approach (Bass, 1985; Burns, 1978). More recently, researchers have argued that effective schools require principals capable of distributing and sharing leadership with other members of the school.

This new perspective on school leadership arises from the assumption that to achieve an effective and efficient teaching-learning atmosphere, principals should distribute and teachers should share a common sense of responsibility for what is being done in the school. From this perspective, principals encourage and support high levels of collaboration and participative decision making among teachers (e.g. Hulpia, Devos, Rosseel & Vlerick, 2012; Leithwood et al., 2010; Spillane & Coldren, 2015). Principals are no longer expected to be the only ones who have the knowledge, skills, and abilities to achieve the school's educational goals; teachers should contribute as well to the leadership process.

Distributed leadership (DL) is defined as a process shaped by day-to-day interactions among leaders, followers, and the situations in which these interactions take place (Gronn, 2002; Spillane, 2006). That is, it involves the social distribution of leadership among individuals or groups of people who perform the leadership function and accomplish tasks together (Leithwood, Patten & Jantzy, 2010; Printy, Marks & Bowers, 2010; Spillane, Camburn, Pustejovsky, Pareja & Lewis, 2009; Spillane, Halverson & Diamond, 2004; Spillane, 2006, 2012). Like other definitions of leadership (instructional, transformational), school leaders influence followers and outline their practices. However, DL introduces the school

characteristics (situation) as a potential factor influencing leadership practices (e.g. Hulpia et al., 2012; Spillane et al., 2004; Urick, 2016).

## **Teacher Turnover**

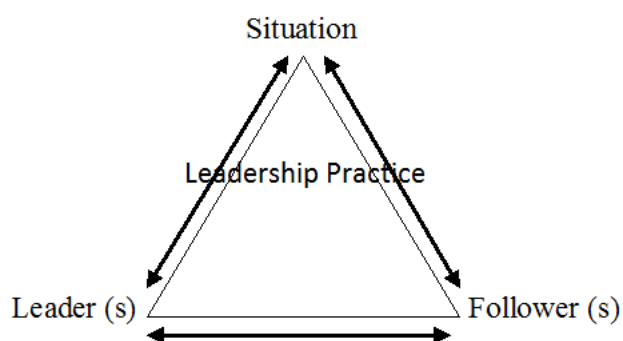
Along with the principal's leadership style, teacher retention also has become a major concern in educational research due to its relationship between effective schools and student outcomes (Griffith, 2004; Ladson-Billings & Tate, 2006; Robinson, Lloyd, & Rowe, 2008). Again, school leadership has been examined by describing and grouping behaviors that principals demonstrate and the effects of these behaviors on teacher retention, adding teacher retention to the issues principals should address as well (Ladd, 2011; Urick, 2016).

In 2003, Darling-Hammond reported that teachers were leaving the profession at alarming rates; new as well as experienced teachers were leaving schools, school systems, and the profession altogether. Researchers have focused on identifying the factors influencing teachers' decisions to leave their jobs. Merrow (1999) pointed to the lower number of students in classrooms as a significant factor in the teacher retention rate. Furthermore, he suggested that age and career change were factors that influenced teachers' intent to leave or stay. Research has shown that principals' leadership style, and specifically principals' ability to display DL behaviors, is related to teacher turnover (Currivan, 2000; Loeb, Darling-Hammond, & Luczak, 2005; Urick, 2016). Devos, Tuytens and Hulpia (2014) argued that teacher organizational commitment relates positively to teachers' perceptions of DL in their schools. Teacher satisfaction with their school's leadership relates negatively to staff turnover and absenteeism; and positively to job effort and job performance (Harris, 2003; Heck & Hallinger, 2009; Leithwood, Harris & Hopkins, 2008; Spillane, 2012; Trammell, 2016). Although some researchers have argued that teacher retention and attrition are long-time common features of the

public school system and there is no need for concern (McCreight, 2000), others think it is imperative to focus efforts on keeping qualified teachers in the profession (Ingersoll & Smith, 2003; More, 2016; Watson & Olson-Buchanan, 2016).

### Conceptual Framework

This study measured two main constructs: teachers' perceptions of DL and teacher turnover. DL is conceptualized as the interaction among three elements: leaders, followers, and the situation (Gronn, 2002; Spillane, 2006). Figure 1 shows the interaction of these elements (Spillane et al., 2004). Spillane stated that leadership activity develops around the social distribution of leadership, where all members of the organization share the leadership function and tasks are accomplished through the interaction of those in formal designated leadership positions, those in non-formally designated leadership positions, and the situation in which these interactions take place (Spillane et al., 2004; Spillane & Camburn, 2006; Spillane, Camburn, Lewis, & Pareja, 2007).

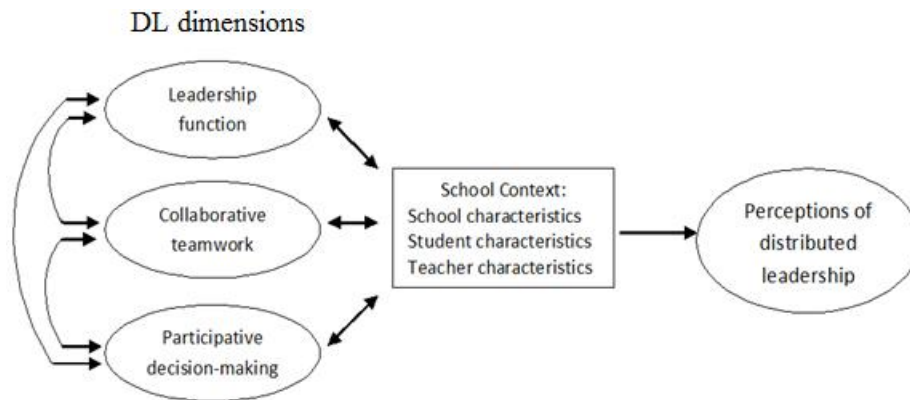


*Figure 1. Elements of leadership activity.*

In line with these definitions, researchers have operationalized DL for its analysis using three DL dimensions: leadership function, cohesive teamwork, and participative decision making

(Heck & Hallinger, 2009; Hulpia et al., 2012). Hulpia et al. (2012), for example operationalized DL in terms of the quality and distribution of leadership functions performed by different members of the leadership team, cooperation within the leadership team, and the participative school decision making of teachers. Similarly, Heck and Hallinger (2009) examined the effects of DL on school improvement and growth in student math achievement. Consistent with this line of research, this study conceptualized DL as the interaction among principals, teachers, and the situation (school characteristics), while performing leadership functions in a collaborative manner, and with teachers' active participation in decision making. Within DL, three sub-constructs were measured: leadership function, cohesive teamwork, and participative decision making (Heck & Hallinger, 2009; Hulpia et al, 2012). In contrast to Hulpia's differentiation between formal and informal leadership positions (leadership teams); this study built upon evidence suggesting that including all school teachers as participants in the enactment of DL in their schools provides a better understanding of DL practice (Spillane, 2006; Spillane & Camburn, 2006; Spillane, Camburn, & Pareja, 2007).

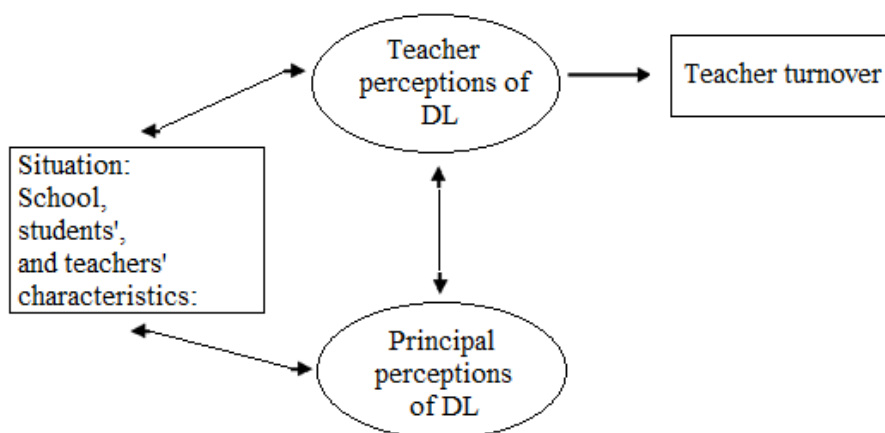
Another difference between this and Hulpia's study (2012) is the situational characteristics included in the analysis. DL theory establishes that the context in which all interactions take place, influences the actual distribution of leadership (Spillane, 2001, 2004, 2015). Therefore, school context characteristics are included in the analysis as mediators of teachers' perceptions of DL. Figure 2 illustrates the theoretical framework used in this study.



*Figure 2. Distributed leadership theoretical framework.*

The second outcome variable measured in this study was teacher attrition. Research has shown that principals' leadership style has an effect on teacher retention rates (Dee, Henkin, & Singleton, 2006; Hulpia et al., 2010; Loeb, Darling-Hammond, Luczak, 2005), particularly teachers' perceptions of school leadership (Urlick, 2016). Teachers who view their principals as exhibiting clear leadership behaviors, communicating school vision and mission, encouraging them to actively participate in school decisions, and promoting professional and personal development through the allocation of time feel more empowered and committed to their school (Bryk, Sebring, Allensworth, Luppescu & Easton, 2010; Hulpia et al., 2011; Moolenaar, Daly & Slegers, 2010; Wahlstrom & Louis, 2008; Ware & Kitsantas, 2011). Therefore, it is expected that teachers' perceptions of DL will have an effect on teacher turnover, after controlling for the effect of school context characteristics.

Figure 3 shows the second part of the conceptual framework for this study.



*Figure 3. The relationship between teachers' perceptions of distributed leadership and teacher turnover framework.*

### **Purpose of the Study**

Teacher retention is a challenge for school administrators in the United States, particularly in large urban districts (Jacob, 2007). Due to its recent development, not a great deal of literature has investigated how DL might influence teachers' intent to stay or leave the profession. Therefore, the purpose of this study was three-fold: to examine the degree of congruence in teachers' and principals' perceptions of DL in the same school; the degree to which school characteristics influence teacher perceptions of DL; and the relationship between DL and teacher intentions to remain employed in the same school.

The first purpose was to explore the degree to which teachers and principals have similar perceptions of DL—the intent was to develop a deeper understanding of DL. This purpose is inherently interesting because the limited extant research has suggested that teachers and principals view leadership behaviors differently. Currently, no studies have looked at the degree

to which teachers and principals perceive DL in the same way. The second purpose was to assess the degree to which teacher perceptions of DL in this particular data set are associated with school characteristics. The results of this particular analysis inform the selection of variables in the analysis for the third purpose. The third purpose was to examine whether teacher perceptions of DL influence an important outcome relative to teacher and school effectiveness—in this particular case, teacher intentions to remain employed at the same school.

### **Research Questions**

RQ1. What is the relationship between teachers' and principals' perceptions of distributed leadership in North Carolina public schools?

RQ2. Do school context variables (school characteristics, school-level student characteristics, teacher characteristics) mediate teachers' perceptions of DL?

RQ3. What is the effect of teachers' perception of distributed leadership on teachers' turnover?

### **Justification for the Study**

Teacher retention has become a major concern in educational research due to its relationship with effective schools and student outcomes (e.g., Engel, Jacob, & Curran, 2014; Griffith, 2004; Ladson-Billings & Tate, 2006; Louis, Leithwood, Wahlstrom, Anderson, Michlin & Mascall, 2010; Robinson et al., 2008). Research has shown that school principals and their leadership style have an effect on teacher retention rates (Coelli & Green, 2012; Dee, Henkin, & Singleton, 2006; Dhuey & Smith, 2014; Fuller & Hollingworth, 2014; Loeb, Darling-Hammond, & Luczak, 2005; Louis et al., 2010). However, literature about the impact of DL on teacher turnover is still limited. Thus, through its findings, this study aimed to offer insights into the

effects of DL on teacher attrition. Additionally, the study aimed to examine how school characteristics (situation) influence teachers' perceptions of DL. Finally, this study intended to offer a better understanding of the relationship between principals' and teachers' perceptions of DL within their own schools.

## **Methodology**

The three-fold purpose of this study was to examine the effect of teachers' perceptions of distributed DL on teacher turnover in North Carolina schools. In line with this three-fold purpose, I first used Pearson's correlation to examine the relationship between teachers' and principals' perceptions of distributed leadership. The Pearson's correlation determines the degree of association between two variables, in this case, teachers' and principals' perceptions of DL in North Carolina public schools. Pearson correlation coefficient quantifies the magnitude and direction of the linear relationship between two variables (Glass & Hopkins, 1996). I expected to find that teachers and principals' perceptions of DL within their schools were strongly positively correlated.

Second, I used multiple linear regression to analyze the extent to which school, students, and teacher characteristics mediate teachers' perceptions of DL. I also used it to examine the degree of association between the variable of interest and more than one independent variable (Glass & Hopkins, 1996). In this case, the independent variables consisted of three subsets of school context characteristics (school, teachers, and students' characteristics). I expected to find that each group of variables contributes with a significant, unique and relevant variance in teachers' perceptions of DL.

Third, I used Stepwise Logistic Regression to study the effect of teachers' perception of DL on teachers' turnover. Stepwise Logistic regression is used in the same way as multiple linear

regression—the difference resides in the dichotomous nature of the outcome variable (Bryk & Raudenbush, 1992); in this case, teachers leaving their jobs (1) and teachers staying (0).

### **Design, Population, and Sample**

This study was based on a quantitative analysis of secondary data. I used a correlational and a predictive design to determine the existence and the nature of the relationships among the variables of interest. The target population consisted of teachers and principals who work in North Carolina public schools, and who responded to the *Teacher Working Conditions Survey* (TWCS) 2005–2006 (Appendix A). The sample included 1,217 public schools in North Carolina in 2006; more than 85% of the state’s schools (1,985) and more than 75,000 (66%) of K–12 licensed elementary, middle, and high school teachers responded to the voluntary survey.

### **Study Instrument**

The *Teacher Working Conditions Survey* (TWCS) 2005–2006 is a 96-item instrument that categorized working conditions into five categories: use of time, facilities and resources, teacher empowerment, leadership, and professional development. Item types such as 5-point Likert scales, yes/no questions, and frequency questions were used to determine teacher and principal perceptions of their working conditions. Demographics added to this data set came from The Common Core of Data (CCD) and from the North Carolina State Department of Education.

### **Variables of Interest**

In the TWCS 2005–2006, teachers and principals were asked to rate on a 5-point Likert scale items related to the enactment of leadership function, cohesive teamwork, and participative

decision making within their schools. The data from the item-scores, which were identified in the literature and in the Exploratory Factor Analysis (EFA), were summed to create three variables, identified as DL dimensions: leadership function, cohesive teamwork, and participative decision making. Further, the total score for these three variables were used in the creation of teachers' perceptions of DL and principals' perceptions of DL. I used both perceptions in the Pearson's correlation analysis. Teachers' perceptions of DL were used as the dependent variable in the multiple regression analysis, and as the independent variable in the stepwise logistic regression analysis to determine its degree of association with teacher turnover. The selection of school context characteristics was driven by the literature review. The group of school context characteristics was formed into three subgroups: school characteristics, student body characteristics, and teachers' characteristics (e.g., Harris, 2009; Hulpia, 2009; Ingersoll, 2001; Leithwood et al., 2006; Harris, 2009; Hulpia, 2009).

### **Analytical Methods**

To examine the existence and nature of the relationship between teachers and principals' perceptions of DL in North Carolina public schools; I carried out a correlational analysis. Pearson's correlation coefficient and significance values address this question. In order to determine the degree to which school variables (school characteristics, student characteristics, teacher characteristics) mediate teachers' perceptions of DL, I used multiple regression analyses. Dependent t-tests and significant values addressed RQ2. Finally, to examine the effect of teachers' perception of DL on teachers' turnover, I used stepwise logistic regression. T-tests and significant values revealed the odds of a teacher leaving his/her job.

### **Organization of the Study**

This dissertation is organized as follows. Chapter 2 presents a review of the academic literature related to school leadership, DL, and teacher turnover. This review provides the foundation for this study and offers a brief description of the evolution of the study of leadership in schools. Further, I introduce DL theory and available evidence about its effect on teaching and learning. I complete this review by presenting findings related to the effect of school leadership on teacher turnover and educational settings.

In chapter 3, I describe the methods I used in the development of this study. Detailed explanations of the research design; sampling, instrumentation, and analysis procedures are included. Chapter 4 and chapter 5 present the findings and an in-depth interpretation, respectively. Finally, chapter 6 lays out the implications, limitations, and recommendations for future research, as well as the conclusion and final remarks.

## Chapter 2

### Literature Review

Over the past decades, the study of school leadership has shifted focus from traditional managerial instructional leadership to more personal-focused transformational leadership (Burns, 1978). Recently, the leadership focus has shifted again, this time to an instructional-collaborative leadership that is shared with teachers (Hallinger, 2003; Hulpia, Devos, & Rosseel, 2009; Leithwood, Seashore, Anderson, Wahlstrom, & Center for Applied Research and Educational Improvement, 2004; Printy & Marks, 2003; Spillane, Diamond & Jita, 2003). This shift to a more *distributed leadership* promotes a restructuring of schools as organizations. From this perspective, the principal is no longer solely responsible for leading the instructional program within schools, but rather for providing direction and support to teachers in order to actively distribute this responsibility (Hulpia et al., 2009, Marks & Printy, 2003; Spillane 2012; Spillane, et al., 2009). School leadership that is shared with teachers has been found to have the largest effect on student academic growth (Heck & Hallinger, 2010; Marks & Printy, 2003; Robinson et al., 2008). Unfortunately, little is known about the ways in which principals have adjusted their leadership style to engage teachers in the practice of school leadership (Hallinger, 2010; Robinson, 2008; Urick & Bowers, 2011). While much of the research has focused on teachers' perceptions of principals' instructional and transformational leadership styles and their influence on the school, little research has examined the effect of principals' DL on teacher turnover.

To gain a better understanding of the concept of school leadership and its effect on the school as organization, this chapter presents a brief chronological description of the evolution of the term, as well as the introduction of the three main leadership styles: instructional, transformational, and distributed. Further, this literature review offers a brief description of the

effect of leadership style on teacher turnover. Finally, the literature related to the effects of principals' leadership style on teacher turnover is explored. The literature presented here provides the foundation for examining the relationship between teachers' perceptions of DL and teacher attrition in North Carolina public schools.

### **The evolution of principal leadership styles: from Instructional to Distributed**

Principals are considered an important component of the school as an organization (Branch, Hanushek, & Rivken, 2012; Firestone & Pennell, 1993; Hallinger, 1992; Knight, 2011). School leadership is identified as a key factor influencing teacher turnover (Harris, 2003; Hulpia et al., 2010, 2012; Leithwood, Harris & Hopkins, 2008; Spillane, 2012; Trammell, 2016). The study of school leadership has changed over time based on expectations of principals' functions and roles in the school. The evolution of school leadership becomes evident as we review the process chronologically. Reviewing leadership styles from a chronological perspective helps us understand what principals *were* and still *are* expected to do in schools and *how* these expectations shape their leadership style through their behaviors. The purpose of this part of the chapter is to briefly describe the three main principal leadership styles identified in the literature and how they have changed and shaped our expectations of principals' roles and functions in schools over time.

#### **Instructional leadership**

From the 1920s to the 1960s, schools were consolidating and principals were expected to function like corporate managers (Hallinger, 1992). In the 1960s and 1970s, curriculum reform in science and mathematics started the effective school movement. "Effective schools" were schools that succeeded in educating all students, regardless of their socio-economic status or

family background (Lezotte, 2001). During these decades, principals' roles changed to include monitoring compliance with federal regulations, assisting with staff development, and supporting teachers in the classroom (Hallinger, 1992).

In that era of school reform, school leaders were no longer expected to only monitor the school but also to lead instructional programs and to work with staff to improve student outcomes. Instructionally effective schools were expected to have strong leaders who focused not only on managing the school, but also emphasized curriculum and instruction (Hallinger, 1992). Unfortunately, there was no clear definition of what an instructional leader was, or what needed to be achieved to become one (Bossert, Dwyer, Rowan, & Lee, 1982; Heck, Larsen, & Marcoulides, 1990; Sammons, 1995).

Consequently, research on instructional leadership focused on identifying characteristics of successful leaders. Tyack and Hansot (1982) identified generally enacted behaviors of instructional principals in effective schools; since then, several studies have identified instructional principals' behaviors. These behaviors include: (a) monitoring student progress; (b) being highly visible in their supervisory roles; (c) visiting classes; (d) observing teaching; (e) responding to those observations (Bossert, Dwyer, & Lee, 1982; Edmonds, 1981); (f) being experts in curricular development and teaching; (g) generating a common sense of vision among their staff (Rowland & Adams, 1999; Tyack & Hansot, 1982); (h) being assertive, strong disciplinarians; and (i) evaluating the achievement of basic objectives (Brookover & Lezotte, 1979; Hallinger, 2005; Hallinger & Murphy, 1986).

In addition to this, instructional principals were also expected to build school culture and academic press, and have high expectations for student achievement (Bossert et al., 1982; Hallinger, 2005; Heck, Larsen, & Marcoulides, 1990; Marks & Printy, 2003; Rosenholtz, 1989).

Only a few studies have suggested the inclusion of other characteristics such as a strong results orientation, strength of purpose, and a willingness to involve others in the process of decision making (Rosenholtz, 1985; Sammons, 1995).

### **Transformational leadership**

Leadership as a concept evolved, moving from an organization-management perspective to a more human-relations one oriented toward emphasizing organizational-behavior. Burns (1978) introduced the concept of transformational leadership. Transformational leaders are expected to engage with others and create connections that raise the level of motivation in both leader and follower alike. Transformational leadership proposes encouraging members of the organization to work together to provide support, intellectual stimulation, and personal vision.

Transformational leadership focuses on motivation, shared values, and goals, with followers converted into leaders and leaders into moral agents who seek to “raise the level of human conduct and ethical aspiration of both the leader and led, and thus it has a transforming effect on both” (Burns, 1978. p. 20). This holistic transformation benefits those involved in the process, changing levels of commitment and increasing capacity for achieving mutual purposes (Bogler, 2001).

From an educational perspective, transformational leaders identify goals to be achieved and practices to be used in their achievement through the enhancement of individual and collective problem-solving capacities (Leithwood, Begley & Cousins, 1994). Leithwood (1994) identified the following seven components of transformational leaders: (1) building school vision and establishing school goals; (2) providing intellectual stimulation; (3) offering individualized support; (4) modeling best practices and important organizational values; (5) demonstrating high performance expectations; (6) creating a productive school culture; and (7) developing structures

to foster participation in school decision (Leithwood, 1994; Leithwood & Jantzi, 2000). In addition, principals establish effective staffing practices, provide instructional support, monitor school activities, and buffer staff from excessive and distracting external demands (Leithwood, Jantzi, & Steinbach, 1999; Leithwood & Jantzi, 2005).

The contributions of these scholars have helped advance understanding of how these concepts translate to school organizations. Educational research has identified school principals as either transformational or instructional. The knowledge produced through these empirical studies and investigation has helped us understand how leadership styles affect school environment, teachers, and student achievement. However, like instructional leadership, transformational leadership continues to focus on the principal as the sole leader enacting a set of behaviors, rather than analyzing *why* principals enact those behaviors and *how* school context drives their selection. Due to the dynamic nature of schools, it can be argued that the study of *how* leadership works in schools should be analyzed from a more holistic perspective in which all actors are taken into consideration at the moment of analyzing school function.

### **Distributed leadership**

In recent years, the concept of DL emerged as a highly promising response to the complex challenges that schools currently face (Leithwood et al., 2010). Recently, the practice of developing teacher leadership was being explored and promoted (Weiss & Cambone, 1994). The idea of teachers working together in teams and teachers taking a variety of responsibilities within the school was strengthened (Spillane, 1999). It was considered beneficial to students if teachers were more involved in leading the school.

Early studies identified differing interpretations of DL and its impact on teachers and on the school (Hallinger & Heck, 1996a,b; Louis & Marks 1996). Nevertheless, the idea of

principals and teachers collaborating with one another, working together to improve their teaching practices and school climate certainly moved away from the commonly assumed isolated and individualistic teaching practice (Spillane 2001). Researchers have argued that DL is central to the teaching and learning process in school and have agreed that leadership involves all members of the school community, and not one person at the top of the organization (Badaracco, 2001; Duignan, 2006, 2007; Gronn, 2002; Hulpia et al., 2012; Spillane et al., 2003, 2004; Spillane & Coldren, 2015; Uhl-Bien, 2006; Urick, 2016).

Since its appearance, DL has been conceptualized and studied from different perspectives. Spillane and colleagues (1999), for example, using distributed cognition and activity theory as theoretical foundations, developed a distributed perspective on school leadership to frame the study of leadership practice. This perspective moves beyond only acknowledging leadership practice as an organizational property and includes the social and situational contexts of the school in the study of leadership distribution (Spillane et al., 1999, 2001).

Spillane (1999) and Gronn (2002) argued that DL is not simply a function of what a school principal, or indeed any other individual or group of leaders knows and does; rather, it is about the activities engaged in by leaders, in interaction with others, in particular contexts around specific tasks (Spillane, 1999, p. 6). Thus, leadership roles are played by multiple individuals, whether in formal or informal leadership positions. According to Spillane and Diamond (2007a,b), all members of the school can and should take responsibility for leading and managing, shifting from previous leadership perspectives in which the principal or assistant principal were the only individuals responsible for leading the institution, to a new perspective in

which leadership roles are played by different people at different times (Spillane, Camburn, Lewis, & Pareja, 2007).

This theory of DL moves beyond individual leadership and studies *what* leaders know and do, and *how* leaders think and act in a specific situation, integrating social components as key components. From this perspective, DL highlights not only the interactions between people, but the interdependence between people and their context (Spillane, Halverson, & Diamond, 2001). To illustrate the interdependence among the teacher, their students, their subject department and the overall school culture and context, Spillane (1999) offered as an example a pilot landing a plane using his own skills, the instruments and controls of the plane, and taking into account the weather conditions and the state of the runway. This illustration could easily be transferred to the school context. For example, leadership distribution is going to differ within a large-urban school serving a heterogeneous student body, compared to a small-rural school serving a homogenous student population. This example highlights how, in contrast to other types of leadership (e.g. instructional, transformational), DL theory recognizes the importance of taking into account particular contexts and circumstances as key components in understanding *how* leadership distribution takes place in schools (Bolden, 2011; Gordon, 2010; Spillane et al., 1999, 2003, 2004, 2015; Youngs, 2009).

In brief, the theory of DL refers to a process in which the principal is not the only leader, but rather leadership occurs through people's interactions with each other and the context in which these interactions take place. From this perspective, leaders, followers, and the situation are interdependent. As with other definitions of leadership (e.g., instructional, transformational), school leaders influence followers and outline their practice, particularly in relation to teaching

and learning practices. However, DL incorporates the particular context of the school as a potential factor influencing and shaping leadership practices.

Other scholars have contributed to the development of DL theory by emphasizing the importance of personal relationships among school members. Duignan (2006, 2007), for instance, emphasized the need for a strong sense of trust guiding DL practices within the school. This trust may be achieved through organizational members' commitment to maximizing opportunities and outcomes for students. Duignan (2007) suggested that principals carry out their leadership roles emphasizing personal growth and teacher empowerment, and increasing teacher participation in decision-making processes. Similar to Spillane (2004) and Gronn (2002), Duignan conceived of DL as ongoing processes of interaction and negotiation among all school members as they construct and reconstruct each day's reality by working productively and compassionately.

In total, researchers have suggested that in order to respond productively to these challenges, it is necessary to rely not just on an individual leader's capacities but on the collective effort of many more members of the school to achieve the educational goal (Hulpia et al., 2012; Robinson et al., 2008; Spillane, et al., 2004, 2006; Spillane, 2015; Urick, 2016). Currently, DL has become the most commonly used approach by researchers, policy makers, educational reformers, and leadership practitioners as these seek to identify educational leadership sources (Hammersley-Fletcher & Brundrett, 2005; Hulpia et al., 2012, 2014; Leithwood et al., 2010; Storey, 2004; Urick, 2016). However, there are still competing and sometimes conflicting interpretations of what DL actually means (Carson, Tesluk & Marrone, 2007).

### **Distributed Leadership theoretical framework: setting direction**

At this time, the operationalization of DL for empirical research has not achieved a consensus (Carson, Tesluk, & Marrone, 2007). Several researchers have built their studies upon Spillane's (2006) and Gronn's (2002) definition of DL, which states that DL is the interaction among leaders, teachers, and the situation, taking place through the social distribution of the leadership function (e.g., Hulpia et al, 2009, 2010; Urick, 2016). Leithwood et al. (2007), for example, examined the influence of different sources of leadership (e.g., district leaders, principals and teachers leaders). Others have examined the extent to which the leadership functions are distributed and performed (Spillane & Camburn, 2006; Spillane, Camburn, Lewis, & Pareja, 2007). More recently, broader operationalizations are being applied in the study of DL. Heck and Hallinger (2009) studied DL as a form of performance of the leadership function, collaboration, and participative decision making in which all members of the school community are involved.

Hulpia et al. (2012) studied the quality of the distribution of the leadership function among different members of the leadership team; cooperation within the leadership team; and the participative decision making of teachers. The authors found evidence to support the study of DL through these three dimensions. Their findings also showed that teachers prefer to be supervised by leaders in formally designated positions (e.g., principal, vice principals) but supported by all other members of the school. Additionally, collaboration among leadership team members and participative decision making were crucial to a well-perceived leadership distribution. These findings are important to the empirical study of DL; however, research has shown that when studying leadership distribution in schools, better results occur when all members of the school are included. In other words, teachers perceive a better distribution of leadership within their

schools when no differentiations between formally and informally designated leadership positions are made (Spillane & Camburn, 2006; Spillane, Camburn, Lewis, & Pareja, 2007).

To gain insight and a better understanding of DL, this study built upon Hulpia's (2012), Heck and Hallinger's (2009), and Urick's (2016) operationalization and defined DL dimensions as 1) leadership function; 2) cohesive teamwork; and 3) participative decision making. Nevertheless, it also proposed two main differentiations. First, rather than differentiating between leadership teams and the rest of the teachers, this study extended to all teachers' performance of DL dimensions. While Hulpia et al. (2012) focused on the cohesion of the leadership team and their interaction with the rest of the school personnel, Spillane (2006) and Heller and Firestone (1995) showed that when performing leadership functions and routines in the school, there is no differentiation between individuals with formal and informal designations of leadership position and the rest of the teachers. In other words, the enactment of leadership functions can be attributed to teachers and leaders equally. Evidence has suggested that focusing only on formally designated leaders (e.g. team leaders) might lead to a loss of information from informal leaders' perceptions of the distribution of leadership in the everyday practice of school activities (Spillane et al., 2006, Spillane, 2015). Second, Hulpia (2012) examined gender, seniority, school size, size of the leadership team, school type, and school denomination as context variables. Urick (2016) included student body characteristics; this study included, in addition to these variables, principal characteristics.

### ***Leadership Functions***

In addition to supervision and support (Hulpia et al., 2012), this study included other key leadership behaviors identified in the literature on successful leaders (Burns, 1978; Camburn, Rowan, & Taylor, 2003; Heller & Firestone, 1995; Leithwood et al., 2007; Pounder, Ogawa, &

Adams, 1995), as well as in the DL literature (Spillane, 2004). Therefore, in this study, leadership function was operationalized in relation to the performance of the following tasks:

- developing and managing a school culture conducive to conversations about the core technology of instruction by building norms of trust, and collaboration among staff;
- procuring and distributing resources, including materials, time, support, and compensation;
- supporting teacher growth and development, both individually and as a faculty member;
- providing both summative and formative monitoring of instruction and innovation; and
- establishing a school climate in which disciplinary issues do not preclude instructional issues (Spillane et al., 2004).

### ***Cohesive teamwork***

Spillane and colleagues (2003, 2004, 2015) argued that DL is a collective, coordinated, and collaborative effort. In order to work in collaboration, formal leaders should have a coherent management framework, characterized by group cohesion. Group cohesion in the teamwork literature is denoted by the importance of collaboration, presence of multiple and complementary strengths and expertise, and need for all members to share a common goal to achieve (Bennett, Wise, Woods, & Harvey, 2003; McGarvey & Marriott, 1997). This concept does not refer to the aggregated sum of individual action but to the interconnected work among formal and informal leaders and followers to create a consensus on ways of working (Woods, Bennett, Harvey & Wise, 2004). These characteristics of collaborative work are crucial to the development of effective DL (Harris, 2005; Heck & Hallinger, 2009; Spillane et al, 2003). Therefore, this study analyzed the interaction between the principal and teachers through the allocation of time for teacher interactions among peers (Spillane et al., 2006). For these interactions to take place and

the development of a *cohesive teamwork*, I argued that teachers need time to communicate and cooperate with each other. This collaboration provides teachers the opportunity to develop mutual trust, improve their teaching skills through the interchange of experiences, and mutual feedback.

### ***Participative decision making.***

Recent studies have claimed that teachers' active participation in decision-making processes is a clear form of interaction among DL actors. Wahlstrom and Louis (2008) argued that when teachers perceive that their opinions are being taken into consideration, their perceptions of leadership distribution in the school increase (Spillane, 2006; Spillane & Camburn, 2006; Spillane, Camburn, & Pareja, 2007), as well as their commitment (Hulpia et al., 2012; Urick, 2016). Another positive consequence of teachers' involvement is that the decision-making process is viewed as the responsibility of groups rather than the individual (Harris, 2005), reinforcing the DL premise.

Several researchers have examined participative decision making as teachers' participation in critical decisions that directly affect their work, such as issues relating to budgets, teacher selection, scheduling, and curriculum. For the study of decision making in DL, I used joint decision-making theory, which establishes that leaders discuss problems with other members of the school and together arrive at a final decision, one in which each has had some influence (Gronn, 2002; Spillane, 2010; Spillane & Camburn, 2006; Spillane & Coldren, 2015).

### ***The situation***

As mentioned before, DL research examines leadership activity using its three constituting elements: leaders, followers, and the situation in which the activities take place. Therefore, school context characteristics are included in the theoretical framework. Previous

research has used mostly qualitative methods in the study of DL, arguing that the analysis of day-to-day life in schools could only be captured by such methodology (e.g., Spillane, 1999, 2001, 2004). However, recently, researchers have shown that the study of DL can be conducted through qualitative or quantitative approaches (Camburn et al., 2003; Hulpia et al., 2012; Heck & Hallinger, 2009; Spillane et al., 2005, 2006, 2007, 2010; Urick, 2016). Hulpia et al. (2011) included teacher characteristics, and school characteristics in their analysis. Urick (2016), in addition to these variables, incorporated student characteristics in their study of principals and teachers typologies. In addition to these three groups of school characteristics, this study included principal characteristics in the analysis of teachers' perceptions of DL. The variables included in each subgroup are detailed in the next chapter.

In sum, this study conceptualized DL as the interaction between teachers' and principals' perceptions of leadership functions, collaborative teamwork, and participative decision making, and the mediator effect of the school characteristics in which these interactions take place (Hulpia, 2012; Spillane, 2006, 2015; Spillane & Camburn, 2006; Spillane et al., 2007; Urick, 2016).

### **Relationship between Distributed leadership and personnel turnover**

Research on employee turnover is primarily concerned with voluntary turnover, which is defined as individual movements across the membership boundaries of an organization or social system, which is initiated by the individual (Ingersoll & Smith, 2003). Researchers have developed several models of determinants and processes underlying voluntary turnover (e.g., Currivan, 2000; Hom & Griffeth, 1995; Lee & Mitchell, 1994). In the study of voluntary turnover, the most commonly used models assume causal relationships to employee job

satisfaction or organizational commitment (Hulpia, Devos & Rosseel, 2009; Hulpia & Devos, 2010; Hulpia et al., 2011).

Since data on employees who quit voluntarily are difficult to collect, researchers often focus on the most direct determinant of turnover—intent to stay (Iverson, 1996; Ladd, 2011; Price, 1997). Intent to stay is defined as the degree of likelihood that an employee will maintain membership in an organization (Currigan, 2000; Iverson, 1996). Intent to leave refers to the employee's intention to leave their current job. These intentions have been demonstrated to have a strong negative effect on actual turnover (Iverson, 1996; Ladd, 2011; Mueller, Boyer, Price, & Iverson, 1994).

In addition to intent to stay, researchers often use job satisfaction and organizational commitment as intervening variables in predicting employee turnover (Iverson, 1996; Mueller et al., 1994). A wealth of empirical evidence links greater commitment to greater intent to stay and, consequently, lower attrition (e.g. Currivan, 2000; Hom & Griffeth, 1995; Lincoln & Kalleberg, 1996). Mueller and Lawler (1996) included working conditions variables to their analysis. They found a strong influence of working conditions on turnover. Factors such as autonomy, routinization, peer support and supervisor support, job stress, and salary influence turnover (Mathieu & Zajac, 1990). In education, difference between teachers leaving or staying is influenced by work characteristics, leadership style, and the different structures or levels of schooling (Hulpia et al., 2011, 2012; Urick, 2016). Odland and Ruzicka (2009) found that school characteristics have an impact on teachers' decision to leave a school. In fact, school leadership is a key factor influencing teachers' attrition (Coelli & Green, 2012; Dhuey & Smith, 2014; Fisman, Khurana, Rhodes-Kropf, & Yim, 2013; Fuller & Hollingworth, 2014; Grissom, 2011; Louis et al., 2010; Odland & Ruzicka, 2009; Robinson et al., 2008; Urick, 2016).

### **Relationships between Distributed leadership and other school-related variables**

Currently, evidence of the effect of DL on teacher attrition is limited. However, several studies have used a DL framework to analyze its impact on, for example, school improvement and teacher commitment. The relationship between DL and organizational change has been studied in more detail. Research has shown that different patterns of leadership distribution have a great impact on organizational change (Harris & Spillane, 2008; Leithwood et al., 2007; Spillane & Camburn, 2009). Zheng, Yang, and McLean (2010) argued that the development of leadership capacity within the school and its distribution are a key to organizational success. For example, Glickman, Gordon, and Ross-Gordon (2001) found that DL is one of the main characteristics in improving student learning outcomes, fostering creativity and innovation (Scribner, Sawyer, Watson, & Myers, 2007); and increasing commitment to the collective vision of the school with great sustainability of effort and loyalty (Muijs & Harris, 2003; Neuman & Simmons, 2000). DL is also recognized as an essential component of high performance learning organizations (Chrispeels, 2004) due to its positive relationship to teachers' self-efficacy and level of morale (Harris, 2005).

Ladd (2011) studied teacher turnover using data obtained from the *2006 North Carolina Working Conditions Survey*. Even though no specific leadership framework was applied in this study, Ladd found that components such as support and supervision, as well as teachers' active participation in decision-making processes and teacher collaboration among peers, are highly negatively correlated with teacher turnover. In other words, the greater the teachers' perceptions were of strong-supportive leadership, which incentivizes active participation in decision making and collaboration among teachers, the lower the probability of these teachers leaving the school.

Devos, Tuytens and Hulpia (2014) studied the relationship between distributed leadership and teachers' organizational commitment and job satisfaction in secondary schools. Their findings showed that DL in form of leadership functions, cohesion of the leadership team, participative decision making, and context variables have a strong positive relationship with organizational commitment. Hulpia et al. (2012) studied the effects of DL in terms of cooperative leadership team, participative decision making, and context variables on teachers' organizational commitment in Flanders (Belgium). Their findings revealed that teachers' organizational commitment was mainly related to quality of the supportive leadership, cooperation within the leadership team, and participative decision making.

### **Possible negative impacts of DL in schools**

In contrast to the evidence regarding the benefits of leadership distribution within schools, some evidence has indicated that informal leadership distribution can negatively affect teamwork, consequently producing inefficiencies within the teams (Heinicke & Bales, 1953). Some practical difficulties associated with distributing leadership in schools have been pointed out in the literature. DL can result in conflicting priorities and missions, and competing leadership styles can emerge (Storey, 2004; Timperley, 2009). Harris (2005) pointed out that major structural, cultural, and micro-political barriers operating in schools might make distributed forms of leadership difficult to implement. In the traditional hierarchy of leadership in schools, power is expected to stay at the top of the school (Mayrowetz, Murphy, Seashore, & Smylie, 2007); thus, renegotiation of institutional roles can make many people uncomfortable (Macbeath, 2005; Neuman & Simmons, 2000). DL can also lead to role conflict and confusion over who has the right to make final decisions. Renegotiating an individual's role can make the

line of authority unclear, confusing for administrators and teachers alike (Lashway, 1997a,b; Smith & Piele, 1997).

Additionally, leaders distributing leadership can be perceived as an abandonment of their responsibilities and an increment in workload and stress for all school members (Lashway, 1997a,b). Timperley (2005) stated that the distribution of leadership across several people might simply result in the distribution of incompetence. Therefore, while leadership distribution among teachers may be desirable, the process has to take into consideration all potential difficulties involved (Timperley, 2005). Currently, there is little evidence of either a positive or negative impact of teachers' perceptions of DL on teacher attrition. Based on empirical evidence about the impact of school principals on teacher turnover (Dee, Henkin, & Singleton, 2006; Ladd, 2011; Loeb, Darling-Hammond, & Luczak, 2005; Urick, 2016), this study hypothesized that DL has a positive impact on teacher retention.

In total, over the last few decades the educational literature has defined differences in school leadership by examining principal leadership styles such as instructional, transformational, and distributed. Each leadership style has been matched with particular principals' behaviors. Instructional is connected to managerial tasks focused on coordination of curricula (Bass, 1985; Bass & Avolio, 1990), transformational influences the building of community and professional development (Bass & Avolio, 1993; Bogler, 2001; Leithwood, 1994), and distributed is linked with teachers sharing responsibilities through collaboration and participative decision making (Gronn, 2002; Spillane, 2001, 2004). Together, these styles represent a set of leadership behaviors that often overlap across styles (Leithwood et al., 2010; Urick & Bowers, 2014). Even though all of these behaviors are associated with changes in

educational and organizational outcomes, DL has been identified as the one with the largest effects on schools (Robinson et al., 2008).

DL is defined as the interaction among leaders, teachers, and the situation in which the social distribution of leadership takes place (Gronn, 2002; Spillane, 2001, 2004). The operationalization of DL for empirical study has changed over time. Researchers have examined the extent to which the leadership functions are distributed and performed (Spillane & Camburn, 2006; Spillane, Camburn, Lewis, & Pareja, 2007), the influence of different sources of leadership (Leithwood et al., 2007), and more recently, in terms of leader support and supervision, participation in decision making and collaboration among school personnel (e.g. Heck, and Hallinger, 2009; Hulpia et al, 2012; Spillane & Coldren, 2015; Urick, 2016).

Despite the evidence suggesting that DL is beneficial for educational outcomes (Heck & Hallinger, 2009), increases organizational commitment (Devos et al., 2014), and has the largest positive effects in schools (Robinson et al., 2008), there is also evidence that informal leadership distribution in schools can affect teamwork and reduce efficiency (Lashway, 1997a, b). Building upon this evidence and research on the impact of principal leadership style on teacher turnover, the aim of this study was to gain insight into the relationship between the ways in which teachers perceive leadership distribution in their schools and the effect of these perceptions on teacher attrition.

## **Chapter 3**

### **Methodology**

The three-fold purpose of this study was to examine the effect of teachers' perceptions of DL on teacher turnover in North Carolina schools. In line with this three-fold purpose, I formulated the following research questions:

RQ1. What is the relationship between teachers' and principals' perceptions of DL in North Carolina public schools?

RQ2. Do school context variables (school characteristics, school-level student characteristics, teacher characteristics) mediate teachers' perceptions of DL?

RQ3. What is the effect of teachers' perception of DL on teachers' turnover?

### **Research design**

This quantitative secondary data analysis used correlation to answer RQ1: What is the relationship between teachers and principals' perceptions of distributed leadership in North Carolina public schools? Correlation is a bivariate analysis that measures the strength of the association between two variables (Cohen, Cohen, West & Aiken, 2013)—in this case, teachers' and principals' perceptions of DL. Researchers have argued that Likert scale questions produce ordinal data; therefore, the data obtained through these questions should be analyzed using Spearman's rank correlations. Others have argued that the sum of the scores of many Likert scale items is interval (Carifio & Perla, 2008; Cohen et al., 2013); thus, the data can be treated as continuous. Several studies have shown that the Pearson correlation is robust with respect to skewness and nonnormality (Havlicek & Peterson, 1976, as cited in Norman, 2010; Pearson, 1931, 1932a,b). Preliminary analysis has shown that the dataset used in this study not only does

not present nonnormal distribution, but also met the assumptions of Pearson's correlation (see Appendix B). Therefore, this study used the Pearson's correlation coefficient to quantify the magnitude and direction of the linear relationship (Cohen et al., 2013; Glass & Hopkins, 1996) between teachers' and principals' perceptions of DL. I expected to find that teachers' and principals' perceptions of DL within their schools are positively correlated.

In order to answer RQ2: Do school context variables (school characteristics, student characteristics, teacher characteristics) mediate teachers' perceptions of DL, I used stepwise multiple linear regression (Cohen et al., 2013). Multiple linear regression is used in making *predictions* with multiple independent variables and one dependent variable (Cohen et al., 2013, p. 3). In this case, the dependent variable is teachers' perceptions of DL and the independent variables are the groups of context characteristics. The group of school characteristics consists of three subgroups (school's, students' and teachers' characteristics). Thus, teachers' perceptions of DL is modeled as a function of these several variables (characteristics) with their corresponding coefficients, along with the constant term (see equation 3.1). Multiple regression analysis shows the extent to which each group of school variables (school, teachers', and students') contributes unique and relevant variance in *predicting* teachers' perceptions of DL, as well as their magnitude and direction (Cohen et al., 2013).

Finally, I used stepwise logistic regression to address RQ3: What is the effect of teachers' perception of DL on teachers' turnover? Stepwise regression uses independent variables to *predict* a dichotomous outcome variable (Hosmer & Lemeshow, 2012, p. 116). In this study, the outcome variable in RQ3 is binary; teachers who report their intentions to leave (1) and teachers who intend to remain in their job (0) for the next consecutive school year. Therefore, stepwise logistic regression is used to examine the relationship between teachers' perception of DL and

teacher turnover, when controlling for school context characteristics (Bryk & Raudenbush, 1992) (see equation 3.2). In other words, I expected to find that teachers' perceptions of DL are significantly associated with turnover in North Carolina schools, holding schools', students', and teachers' characteristics constant.

### **Dataset**

North Carolina's Governor Michael Easley committed to improve schooling in the state. Toward this end, working conditions surveys were undertaken to analyze and improve teaching-learning conditions. Data from previous surveys in 2002 and 2004 indicated that improving teacher-working conditions would improve student-learning conditions and help retain teachers (Hirsch & Emerick, 2007).

North Carolina, like other states across the nation, has been struggling to find and keep the quality teachers needed to ensure that all students learn at high levels. During the 2005–2006 school year, 12% of teachers left their jobs to either teach elsewhere or quit the profession altogether. Teacher turnover has a negative cumulative effect on student achievement and is a financial drain for the state and districts as each finds itself needing to repeatedly prepare, recruit, and support teachers for the same position (Hirsch & Emerick, 2007). North Carolina developed a survey to assess whether teachers perceived their workplace to have a positive school climate where teachers and administrators support each other, collaborate and actively participate in decision making. Additionally, the survey assessed excessive workload; lack of time; and frustration with reform efforts to improve student learning (Hirsch & Emerick, 2007).

The North Carolina *Teacher Working Conditions Survey* (TWCS) provides educators, stakeholders, policymakers, and the community with this critical understanding of the status of working conditions in schools across North Carolina. The 96-item instrument categorizes

working conditions into use of time, facilities and resources, teacher empowerment, leadership, and professional development. Item types such as 5-point Likert scales, yes/no questions, and frequency questions are used to determine teachers' and principals' perceptions of their working conditions.

In 2006, the TWCS was administered to 2,057 public school districts; 88% of the state's schools (1,807) reached the minimum response rate (40%) necessary to have valid data (Ladd, 2011). However, only 1,217 schools provided information needed to assess teachers' and principals' perceptions of DL. TWCS also includes teachers' demographics: gender, years of experience, ethnicity, and background. In addition, the data set used in this analysis includes school characteristics (school level, student-teacher ratio, school size); and school-level student characteristics (ethnicity, percentage of economically disadvantaged students and percentage of limited English proficient students) from the North Carolina State Department of Education and Common Core of Data (CCD). A copy of the TWCS is presented in Appendix A.

### **Definition of the variables**

To assess the degree to which the TWCS 2005–2006 measures the theoretical constructs identified in the theoretical framework as components of DL (Harris, 2009; Hulpia et al., 2012; Spillane et al., 2006, 2007; Urick, 2016), teachers and principals data were loaded into and analyzed using SPSS version 23.0. An exploratory factor analysis (EFA) of 30 items was performed to determine their factor loadings. A list of all 30 items included in this EFA is provided in Appendix B. This EFA was conducted using only items answered by teachers.

The rotated solution (using a Varimax rotation) yielded a five-factor model. Appendix B presents the rotated solutions for all items included in the analysis. Factor 3 includes items related to collaborative effort (cohesive teamwork - CTW). Factor 2 loadings relate to

constructs aligned with teachers' perceptions of principals' expectations of their job performance (TPE), as an independent factor, separated from leadership. Factor 1, leadership function, relates to principal behaviors; these behaviors are similar to the ones identified in transformational and instructional leadership (Hallinger, 2003; Leithwood et al., 2004; Printy & Marks, 2003; Spillane, et al., 2003; Urick & Bowers, 2014) and with the ones used in DL research (Hulpia et al., 2012; Urick, 2016). Items related to decision making loaded on the same factor (1). In other words, did teachers interpret the request to engage in decision making as part of a formal request from principals? However, the ways in which teachers define participative decision making was not the focus of this study; this study also examined teachers' perceptions of their participation in decision making. Factors 4 and 5 loadings were related to decision making. Items related to teachers deciding on aspects related to instruction, teaching techniques, and student assessment (DM-INST), as well as decisions related to school personnel professional issues (DM-PPI), were identified among the loadings.

Variance explained by the Principal Component extraction method was 62.4%. The literature varies on how much variance should be explained before the number of factors is sufficient. The majority suggests 75–90% (Garson, 2010; Pett et al., 2003); however, some indicate that 50% of the variance is acceptable (Beavers, Lounsbury, Richards, Huck, Skolits & Esquivel, 2013; Kline, 2015).

A second exploratory factor analysis was conducted, this time using principals' responses to the same 30 items in the TWCS. The percentage of variance explained by this analysis was 61.6%. The items loaded on to six different factors, which are detailed in Appendix C. The first factor includes items related to leadership function (LF). Factor 3 relates to collaborative effort (cohesive teamwork - CTW), consistent with the previous EFA. Factor 5

relates to items previously identified as principal's perceptions of teacher's performance (TPE). However, Factors 2 (DM), 4 (DM-PPI), and 6 (DM-INST) are all related to decision making in the school. This can be interpreted as indicating that for principals, teacher participation in school-related decision making load on to separate factors, consistent with the 'teacher empowerment' component of the TWCS 2005–2006, and not on the 'leadership component' as for teacher-response items.

Due to item cross-loading (Kline, 2005), items were removed from both teachers' and principals' lists. Items included: 'The faculty and staff have a shared vision'; 'Teachers are trusted to make sound professional decisions about instruction'; 'Selecting instructional materials and resources'; 'Teacher performance evaluations are handled in an appropriate manner'; 'The procedures for teacher performance evaluations are consistent'; 'Teachers receive feedback that can help them improve teaching'; and 'teachers are held to high professional standards for delivering instruction'.

To better differentiate between the two variables (refer to Ladd, 2011), a third EFA was conducted on all teacher-response items that loaded into factor 1 (LF). As expected, this analysis yielded two factors. Factor 1 includes aspects related to leadership (LF) and factor 2 includes decision making-related items (PDM)—see Appendix D. These two factors explain 71.3% of the total variance. Finally, due to item cross-loading, the following items were deleted from the final list of items: 'In this school we take steps to solve problems'; 'There is an atmosphere of trust and mutual respect within the school'.

### **Independent variables**

Table 1 lists the TWCS 2005–2006 items that loaded on to three factors. These factors are consistent with the DL dimensions identified in the existing literature. First, leadership

function (LF); second, participative decision making (PDM); and third, cohesive teamwork (CTW).

*Table 1. List of Items from the TWCS Related to Distributive Leadership*

Distributed leadership	2006 TWCS items
Leadership function (LF)	1. The school leadership communicates clear expectations to students and parents.
	2. The school leadership shields teachers from disruptions, allowing teachers to focus on educating students.
	3. The school leadership consistently enforces rules for student conduct.
	4. The school leadership support teachers' efforts to maintain discipline in the classroom.
	5. The school leadership consistently supports teachers.
Participative decision-making (PDM)	1. Teachers are centrally involved in decision making about educational issues.
	2. The faculty has an effective process for making group decisions and solving problems.
	3. Selecting instructional materials and resources
	4. Devising teaching techniques.
	5. Setting grading and student assessment practices.
	6. Determining the content of in-service professional development programs.
	7. Providing input on how the school budget will be spent.
	8. School improvement planning.
	9. The selection of teachers new to this school.
Cohesive Teamwork (CTW)	10. Establishing and implementing policies and student discipline
	1. Teachers have time available to collaborate with their colleagues.
	2. Sufficient funds and resources are available to allow teachers to take advantage of professional development activities.
	3. Professional development provides teachers with the knowledge and skills most needed to teach effectively.
	4. Teachers are provided opportunities to learn from one another.
	5. Adequate time is provided for professional development.

### **Assessing leadership functions**

In the TWCS 2005–2006, teachers and principals were asked to assess which leadership functions were being performed in their schools. Leadership items in the TWCS 2005–2006 match behaviors (i.e., trust and respect, support, supervision) applied in identifying effective

distributed leaders in previous research (e.g., Harris, 2005, 2009; Hulpia et al., 2012; Ingersoll, 2001; Spillane et al., 2009). Teachers and principals rated the items on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Using the items that loaded on to the leadership factor, from the aforementioned EFA, I computed a new variable called *Leadership function* (LF) by adding the scores of all five items assessing principals' leadership behaviors as performed in school. Therefore, LF is the total score of all five items assessing principal's leadership behaviors (Table 3.1). Table 3.2 notes the similarities among LF present in the TWCS 2005–2006 and the functions identified in the literature as *what is expected of* principals from a DL perspective.

*Table 2. Similarities among distributed leadership functions: School leader(s)...*

Leadership function (LF) Items in the TWCS 2005-2006	Leadership tasks/functions (Spillane et al., 2001, 2004, 2009)	Leadership functions (Hulpia et al., 2012)
The school leadership consistently supports teachers	Develops and manages a school culture, conducive to conversations about the core technology of instruction by building norms of trust, collaboration and academic press among staff.	Compliments teachers, helps teachers, explains his/her reason for criticism to teachers,
The school leadership shields teachers from disruptions, allowing teachers to focus on educating students. The school leadership support teachers' efforts to maintain discipline in the classroom.*	Providing both summative and formative monitoring of instruction and innovation. Procuring and distributing resources, including materials, time, support, and compensation.	School leader (s) looks out for the personal welfare of teachers. Evaluates the performance of the staff, is involved in summative evaluation of teachers
The school leadership consistently enforces rules for student conduct.	Establishing a school climate in which disciplinary issues do not preclude instructional issues.	Is available after school to help teachers when assistance is needed*
The school leadership support teachers' efforts to maintain discipline in the classroom.  The school leadership consistently supports teachers.	Supporting teacher growth and development, both individually and as a faculty.  Collaboration and academic press among staff*	Provides organizational support for teacher interaction. Is available after school to help teachers when assistance is needed. Encourages teacher(s) to pursue their own goals for professional

		learning. Encourages teacher(s) to try new practices consistent with their own interests.
The school leadership communicates clear expectations to students and parents.	Constructing and selling an instructional vision.	School leader (s) premises a long-term vision, debates the school vision.

\*: Identifies items that overlap in two or more classifications.

### **Assessing participative decision making**

The teacher empowerment domain in the TWCS 2005–2006 refers to teacher participation in the decision-making process in school. Research has shown that teacher empowerment and participative decision making are highly positively correlated (Leithwood et al., 2004; Rice & Schneider, 1994; Somech, 2010). This strong correlation is due to the similarity of the constructs (Kline, 2005). Teachers and principals were asked to rate each decision making-related item on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). In the EFA, items related to decision making loaded on to three different factors: decision making in personnel professional issues (DM-PPI), decision making in classroom instruction (DM-INST), and decision making about school as organization issues (DM). In order to simplify this study, I collapsed all three decision making-related items into one: participative decision making (PDM). Thus, participative decision making is the cumulative score of all ten items described in Table 1.

### **Assessing cohesive teamwork**

Spillane and colleagues (2003, 2004, 2015) argued that DL is a collective, coordinated, and collaborative effort. Building upon this perspective, researchers have studied DL through the analysis of collaboration and cohesive teamwork among leaders and followers within their

schools (Devos et al., 2014; Heck & Hallinger, 2009; Spillane, 2010, 2015; Spillane, Camburn & Pareja, 2006; Urick, 2016). Collaborative processes are defined by, for example, the time and activities that are assigned to teachers to collaborate, learn, and help their colleagues (Devos et al., 2014, Spillane et al., 2015).

TWCS 2005–2006 asks teachers and principals to assess the time and opportunity to interact with colleagues (e.g., teachers have time available to collaborate with their colleagues; teachers receive feedback that can help them improve teaching). Participants are asked to rate each statement on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). I followed the same logic and procedure detailed previously; cohesive teamwork (CTW) is the total score of all five items measuring collaboration identified in the EFA (Table 1).

### **Reliability**

Cronbach's alpha was determined for each factor identified in the aforementioned EFA. The Alpha coefficient ranges in value from zero (0) to 1 and may be used to describe the internal consistency of the items used to collect data. The higher the score, the more reliable the generated scale is (Cronbach, 1951). Values above 0.7 are often considered to be acceptable reliability coefficients but lower thresholds are used sometimes in the literature. For this study, the reliability coefficients for each dimension were LF = 0.92, PDM = 0.87, and CTW = 0.78.

### **Assessing school context characteristics**

The selection of school context characteristics was driven by the literature review. It is important to include school surroundings when studying DL; therefore, the group of school characteristics consists of three subgroups: school characteristics, student body characteristics,

and teachers' characteristics (Harris, 2009; Hulpia et al., 2011; Ingersoll, 2001; Leithwood et al., 2006; Urick, 2016).

The variables included within the group of school characteristics in this study were: principal's gender, ethnicity, and years of experience, school size, and school rating. The subgroup of student body characteristics included proportions of White, Black, and Latino students and proportion of economically disadvantaged students enrolled in the school. Finally, the subgroup of teachers' characteristics incorporated teachers' ethnicity, gender, and years of experience. Table 3 shows the variables included in each subgroup. Dummy codes were created for each variable that had two or more than two categories (ethnicity, years of experience, and gender)

*Table 3. School context characteristics, TWCS 2005-2006*

<b>Characteristics</b>	<b>Variables</b>
Principals' gender	Male (Reference group) Female
Principals' ethnicity	White (Reference Group), Black or African American, Other (Hispanic, American Indian or Alaska Native, Asian or Pacific Islander, Black or African American, Mixed or Multiple Ethnicity, Some Other Race or Ethnicity).
Principals' tenure at the school	10 + years (Reference group) Less than 10 years
School size	Students enrolled
Proportion of students enrolled	% White (reference group) % of minorities (Black or African American and Latino) % economically disadvantaged students enrolled
Teacher's gender.	Male (Reference Group), Female.
Teacher's ethnicity.	White (Reference Group), Black or African American and other (Hispanic, American Indian or Alaska Native, Asian or Pacific Islander, Black or African American, Mixed or Multiple Ethnicity, Some Other Race or Ethnicity)
Teachers' tenure at the school	10 + years (Reference group) Less than 10 years
Survey response rate	% of items responded

## **Dependent Variable**

The dependent variable is a dichotomous measurement indicating whether in the following school year, the teacher intends to leave his/her current school, or intends to stay and continue working. TWCS 2005–2006 asked teachers, 'Which of the following options best describes your future intentions for your professional career?' Teachers were asked to rate their intentions from 1 to 5. The options were: continue teaching at my current school, continue teaching at my current school until a better opportunity comes along, continue teaching but leave this school as soon as I can, continue teaching but leave this school as soon as I can, and leave the profession all together. These answers were dummy-coded into zero (0) continue teaching at my current school and one (1) for all other intentions to leave the school (Ladd, 2011).

## **Data Analysis Procedures**

During the preliminary data analysis phase, I calculated the percentages of response rates by school level. These results are shown in Table 4. Moreover, I calculated the total scores for each one of the DL dimensions: leadership function, participative decision making, and cohesive teamwork. These, with their respective means and standard deviations (SD), are presented in Table 5. Finally, Table 6, reports descriptive statistics (mean and SD) for all the other independent variables included in the analysis.

To answer research question (RQ) 1, I used Pearson's correlation to determine the degree of association between teachers' and principals' perceptions of (DL) in North Carolina schools. First, I calculated the accumulative scores for each DL dimensions (leadership function, participative decision making and cohesive teamwork) for both teachers and principals. Further, I aggregated the data at the school level to test the correlation between teachers' and principals'

perceptions of DL. I used Pearson's correlation coefficient ( $r$ -values) to examine the existence and nature of the relationship between these two variables. Positive correlation coefficients indicate a positive relationship between the variables. Inversely, negative values indicate a negative relationship between the variables. The statistical significance of the correlation coefficient is determined by  $p$ -values less than 0.05.

To answer RQ2, I used stepwise multiple linear regression (Cohen, 2013; Glass & Hopkins, 1996). This analysis shows the extent to which each subgroup of school variables (school, teacher, and student characteristics) contributes unique and relevant variance in predicting teachers' perceptions of DL in their schools, in terms of statistical significance. The statistical significance effect of each subgroup of school characteristics on teachers' perceptions of DL is determined by  $p$ -values  $< .05$ , F-ratio and F-change. In this study, the regression equation in its raw form was:

$$\hat{Y} = B_1X_1 + B_2X_2 + B_3X_3 + \dots + B_nX_n + e. \quad \text{Equation 3.1}$$

Therefore, the regression equation for teachers' perceptions of DL estimated by the variables within each subgroup of school characteristics was:

$$\begin{aligned} \text{Teachers' perception of DL} = & B_1 (\text{principal ethnicity}) + B_2 (\text{principal gender}) + \\ & B_3 (\text{principal tenure at the school}) + B_4 (\text{school size}) + B_5 (\text{school rating}) + B_6 \\ & (\% \text{ students of color}) + B_7 (\% \text{ of economically disadvantaged students}) + B_8 \\ & (\text{teacher ethnicity}) + B_9 (\text{teacher gender}) + B_{10} (\text{teacher tenure at the school}). \end{aligned}$$

Finally, I used stepwise logistic regression to answer RQ3. Teacher turnover was dichotomized based on the teachers' reported intention to leave or stay in the same school for the next consecutive year. The statistical significance of the effect of teachers' perceptions of DL on teacher turnover is determined by Chi-squared change,  $p < .05$ . In this study, the probability of

teacher turnover (1) or teacher staying (0) in their schools was represented in its raw form by the following formula:

$$\ln(\text{ODDS}) = \ln\left(\frac{P}{1-P}\right) = \frac{e^{B_1X_1+B_2X_2+\dots+B_nX_n}}{1+e^{B_1X_1+B_2X_2+\dots+B_nX_n}} \quad \text{Equation 3.2}$$

Thus, the probability of a teacher leaving her or his job was represented by:

probability of teacher turnover

$$= \frac{e^{B_1(\text{school characteristics})+\dots+B_5+B_6(\text{student characteristics})+\dots+B_7+B_8(\text{teacher characteristics})+\dots+B_{12}}}{1+e^{B_1(\text{school characteristics})+\dots+B_5+B_6(\text{student characteristics})+\dots+B_7+B_8(\text{teacher characteristics})+\dots+B_{12}}}$$

Where school characteristics were: (B<sub>1</sub>) principal ethnicity, (B<sub>2</sub>) principal gender, (B<sub>3</sub>) principal tenure at the school, (B<sub>4</sub>) school size, and (B<sub>5</sub>) school rating. Student characteristics include: (B<sub>6</sub>) % of students of color and (B<sub>7</sub>) % of economically disadvantaged students enrolled. Finally, teachers' characteristics were: (B<sub>8</sub>) teachers' tenure at the school, (B<sub>9</sub>) teacher ethnicity, (B<sub>10</sub>, B<sub>11</sub>) teacher gender, survey response rate (B<sub>12</sub>).

## Summary

This chapter presents the methodology I used in order to answer the research questions that motivated this three-fold study. Correlational as well as multiple regression analyses were identified as the most appropriate approach for investigating the relationship between teachers' and principals' perceptions of DL within their schools. The TWCS 2005–2006 provides data for the dependent variable (teacher turnover), as well as demographic data for teachers and principals (gender, ethnicity, and experience), and student body data (percentage of students enrolled by ethnicity, and percentage of economically disadvantaged).

Teacher' perception of DL in this study was constructed based on the EFA factor loadings. The total scores for each DL dimension identified represent the dependent variable for RQ2, and the independent variable in RQ3. The results of these data analyses are presented in the next chapter.

In addition, the assumptions of normality and linearity for the multiple regression analysis were checked. For normality, I used the probability plot of the model residuals; and for linearity, I used a plot of the residuals versus the predicted values (see Appendices E & F). The models did not violate the normality assumption, since the residuals fell along the diagonal line. Moreover, the residuals were randomly distributed, forming a horizontal band around the zero (0) line, meeting the linearity assumption.

For multicollinearity testing, I used variance inflation factor (VIF) and tolerance values. The covariate VIF values range from 1.0 to 2.5 and tolerance values ranged from 0.99 to 0.40 in elementary school. At the middle school level, VIF values ranged from 1.0 to 2.8 and tolerance values ranged from 0.99 to 0.35. Finally, for high school-level variables, the VIF ranged from 1.0 to 3.01 and tolerance value range from 0.99 to .033 suggesting that multicollinearity is not a problem at any of the three levels of schooling.

### **Limitations of the study**

This study has several limitations, especially relating to the use of secondary data obtained via the Teacher Working Condition Survey instrument. First, the use of secondary data limited the possibility of follow-up studies. Second, TWCS 2005–2006 was not designed to measure DL. Nevertheless, North Carolina has been using the TWC survey to improve schooling and teaching conditions. Recently, North Carolina has implemented policies that foster DL core concepts. The North Carolina Professional Teaching Standards Commission (NCPTSC), for

example, recommends that teachers work collaboratively in creating professional learning communities for developing goals and strategies for school improvement and enhancement of teacher working conditions (North Carolina Professional Teaching Standards, 2008).

Unfortunately, currently data from the implementation of these changes are not available for analysis. While this study presents evidence of the validity of the survey-items used in the analysis to accurately assess teachers' perceptions of DL, it was based on the assumption that teachers truly believed the survey was anonymous and confidential, which assures the trustworthiness and validity of the measures; however, missing data may bias the results. Finally, salary has been identified as an important factor influencing teacher turnover. Although this study controlled for several other highly associated variables, the inclusion of this variable might inform better our understanding of this major problem in educational research.

## **Chapter 4**

### **Results**

The three-fold purpose of this study was to examine to which extent teachers' perception of DL predicts teacher attrition in North Carolina schools. DL proposes a model in which leadership is shared and distributed among teachers. Distributed leaders aim for collaborative work and participative decision making within school teachers (Gronn, 2002; Leithwood & Riehl, 2003; Spillane, 2006, 2015; Spillane et al., 2001, 2004, 2006). This study used teachers' and principals' perceptions of leadership functions, cohesive teamwork, and participative decision making within their schools to construct a representation of teachers' perceptions of DL. Additionally, school characteristics are included as mediators of these perceptions of DL. Further, these perceptions are used to examine their effect on teacher turnover in North Carolina schools.

I performed a correlation analysis to examine the existing relationship between principals' and teachers' perceptions of DL in their schools. Consequently, I used multiple regression to determine the proportion of variance in teachers' perceptions of DL explained by school characteristics. Finally, to analyze the extent to which teachers' perceptions of DL is associated with teacher turnover, I used stepwise logistic regression.

In this chapter, I present the results of the study, organized by research questions. All outputs are presented by school level to facilitate their interpretation and presentation. Table 4 shows survey response rates for all teachers who responded to the survey and for the 733 elementary-, 246 middle -, and the 238 high-schools that achieved 40% response rates with available principal data. Moreover, table 5 presents descriptive statistics (mean and SD) for the independent variables from schools with available teacher and principal data.

Table 4. Response rates (%), by school level, TWCS 2005-2006

<b>Response rate of teachers</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>
Elementary	31,661	77.9	19.7
Middle	13,001	74.4	21.3
High	16,649	69.9	20.9
<b>Teachers in schools with response rates equal or greater than 40%</b>			
Elementary	19,304	84.1	15.2
Middle	8,179	82.1	16.1
High	9,494	77.4	18.2

Table 5. Descriptive statistics for the independent variables, by school level

Characteristic	Elementary (N=19,304)		Middle (N=8,179)		High (N=9,494)	
	Mean	SD	Mean	SD	Mean	SD
Survey Response Rate	83.98	15.31	81.94	16.26	77.12	18.22
<b>Teacher</b>						
Female	94.00	-	76.00	-	63.0	-
White	87.00	-	80.37	-	83.35	-
Black	10.15	-	15.74	-	12.12	-
Other	2.950	-	3.890	-	4.530	-
< than 10 years	77.82	-	82.82	-	77.53	-
<b>Principals/schools</b>	(N=733)		(N= 246)		(N = 238)	
Female	70.00	-	50.00	-	31.00	-
White	85.4	-	77.27	-	81.02	-
Black	17.89	-	20.78	-	17.35	-
Other	2.730	-	1.920	-	1.630	-
Tenure at the school						
< than 10 years	84.97	-	90.83	-	77.82	-
11 + years	15.03	-	9.170	-	22.18	-
School met expected growth	53.00	-	58.00	-	58.00	-
School size	548.69	193.09	746.54	244.87	1,262	583.39
% of students enrolled						
White	53.05	26.90	59.28	24.90	61.12	25.40
Students of color	41.95	25.66	40.72	23.82	38.88	23.68
Economically disadvantaged	51.14	21.94	46.56	18.84	37.47	15.55

### Teachers' and Principals' perception of DL

I computed the total scores for each DL dimension (leadership function, participative decision making, and cohesive teamwork) for each individual principal and teacher, as well as

the total score for DL. Missing values were treated as missing. Tables 6a and 6b show descriptive statistics (mean and SD) for each DL dimension organized by level of schooling for teachers and principals, respectively. In the 733 elementary schools, the average score for teachers' perceptions of DL was 65.3 (SD = 6.5) and 82.4 (SD= 7.9) for principals. In 246 middle schools, teachers' perception of DL was 63.2 (SD = 6.5) while the average of principals' perceptions of DL was 82.7 (SD = 7.2). Finally, for the 238 high schools, the average teachers' and principals' perceptions of DL were 61.8 (SD = 6.0) and 81.9 (SD = 7.6), respectively.

*Table 6a. Descriptive statistics for teachers' perceptions of DL dimensions, by school level.*

Teacher	Elementary		Middle		High	
	Mean	SD	Mean	SD	Mean	SD
Leadership function	18.5	2.5	16.9	2.6	16.9	2.4
Participative decision making	29.9	3.4	29.2	3.0	28.6	2.9
Cohesive teamwork	17.0	1.67	17.0	1.6	16.1	1.5
<b>Perception of DL</b>	<b>65.3</b>	<b>6.5</b>	<b>63.2</b>	<b>6.5</b>	<b>61.8</b>	<b>6.0</b>

Note. Minimum and Maximum total scores for: Leadership function (Min = 5, Max = 25), Participative decision making (Min = 10, Max = 100), Cohesive teamwork (Min = 5, Max = 25), and Perception of DL (Min = 20, Max = 150).

*Table 6b. Descriptive statistics for principals' perceptions of DL dimensions, by school level.*

Principals	Elementary (N=733)		Middle (N= 246)		High (N= 238)	
	Mean	SD	Mean	SD	Mean	SD
Leadership function	23.1	2.2	22.6	2.4	22.6	2.2
Participative decision making	39.2	4.5	39.1	4.3	39.2	4.0
Cohesive teamwork	20.2	3.5	21.1	2.8	20.1	3.2
<b>Perception of DL</b>	<b>82.4</b>	<b>7.9</b>	<b>82.7</b>	<b>7.2</b>	<b>81.9</b>	<b>7.6</b>

Note. Minimum and Maximum total scores for: Leadership function (Min = 5, Max = 25), Participative decision making (Min = 10, Max = 100), Cohesive teamwork (Min = 5, Max = 25), and Perception of DL (Min = 20, Max = 150).

**Study variable.** Teachers' intention to stay or leave their current job was dichotomized in this study. TWCS 2005-2006 asked teachers to rate their intentions of continuing to work at their

current school. These answers were dummy coded into zero (0) (continue teaching at my current school) and one (1) for all the other intentions to leave (Ladd, 2011). Table 7 shows descriptive statistics (mean and SD) for teachers' intentions for the next year, organized by school level. In elementary school, the average percentage of teacher "leavers" was 10.8% (SD = 0.3). For middle school, the average was 14.8% (SD = 0.4). Finally, for high school, the average was 13.9% (SD = 0.3).

*Table 7. Descriptive Statistics for teachers who expressed their intent to leave, by school level.*

Level of schooling	N	Mean	SD
Elementary	19,304	10.8	0.3
Middle	8,179	14.8	0.4
High	9,494	13.9	0.3

## Statistical Results

### Research question 1

To determine the relationship between teachers' and principals' perceptions of DL in North Carolina schools, I calculated the correlation between the school mean of teachers' perceptions of DL with the principal's perceptions of DL in the same school. The Pearson correlation coefficient, which measures the direction and magnitude of the relationship between teachers' and principal's perceptions of DL at the school level, was statistically significant at the .01  $\alpha$  level for each school level. Table 8 shows the corresponding values of Pearson's correlation coefficients ( $r$ ), organized by level of schooling.

At the elementary school level, there is a moderate positive correlation (Cohen, 2008) between teachers' and principal's perceptions of DL ( $r = 0.27, p < .001$ ). Similarly, at the middle

school level, the correlation coefficient is also positive and slightly greater than at the elementary school level ( $r = 0.35, p < .001$ ). Finally, at the high school level, the correlation coefficient remained positive, but was slightly weaker than at either the elementary school or middle school level ( $r = 0.19, p < .001$ ). Therefore, teachers' and principals' perceptions of DL were moderately positively correlated at every level of schooling.

*Table 8. Correlation coefficients for teachers' and principals' perceptions of DL, by school level.*

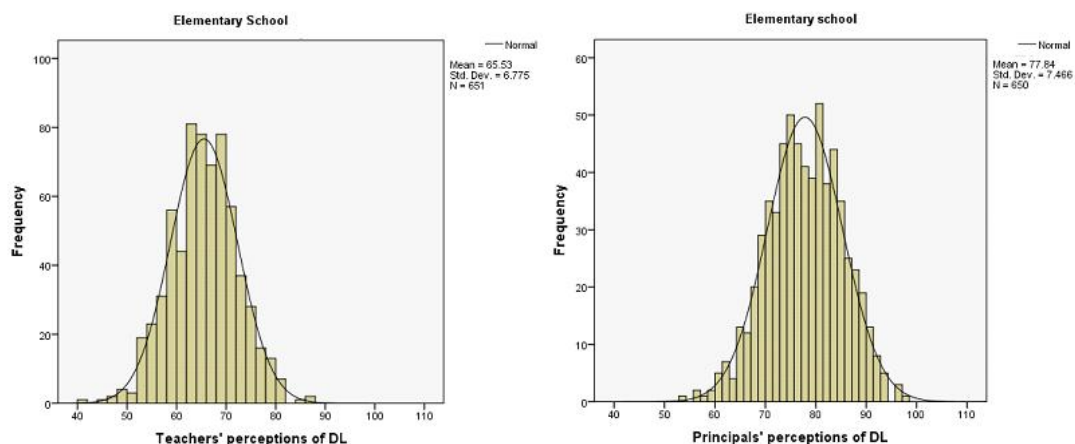
Characteristic	Elementary (N = 733)		Middle (N = 246)		High (N = 238)	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>P</i>	<i>r</i>	<i>p</i>
Perceptions of DL	0.3*	<.001	0.4*	<.001	0.2*	<.001

*Note:* \*. Correlation is significant at the 0.01 level (2-tailed).

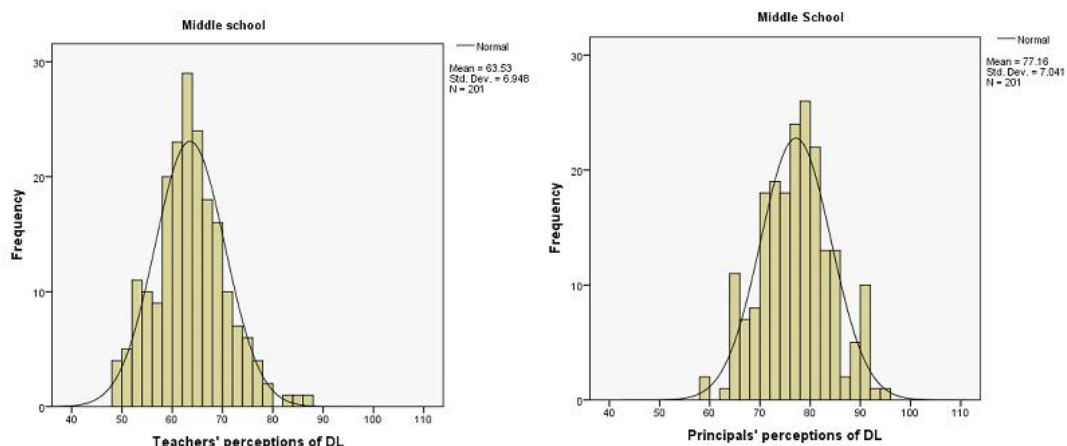
In figure 4, I present the distribution of teacher and principal perceptions of DL for each of the three school levels. These figures show that principals' perceptions of their distribution of leadership are more positive than teachers' perceptions. They also show that teachers' perceptions have slightly less variation than principals'.

Furthermore, I calculated the difference between principals' and teachers' perceptions of DL. Specifically, I used Paired-Samples *t*-tests to examine if the difference between the school-mean teachers' perceptions of DL and the principal's perception of DL in the same school was statistically significant. The significance of this test is given by the *t*-statistics and *p*-value  $< .001$ . Table 9 presents the results of the paired-samples *t*-tests, organized by school level. The differences between teachers' and principal's perceptions of DL at the elementary-, middle-, and high- school levels in North Carolina public schools are statistically significant at the .05  $\alpha$  level. Principals systematically have greater perceptions of DL than teachers in the same school.

## Elementary School



## Middle School



## High School

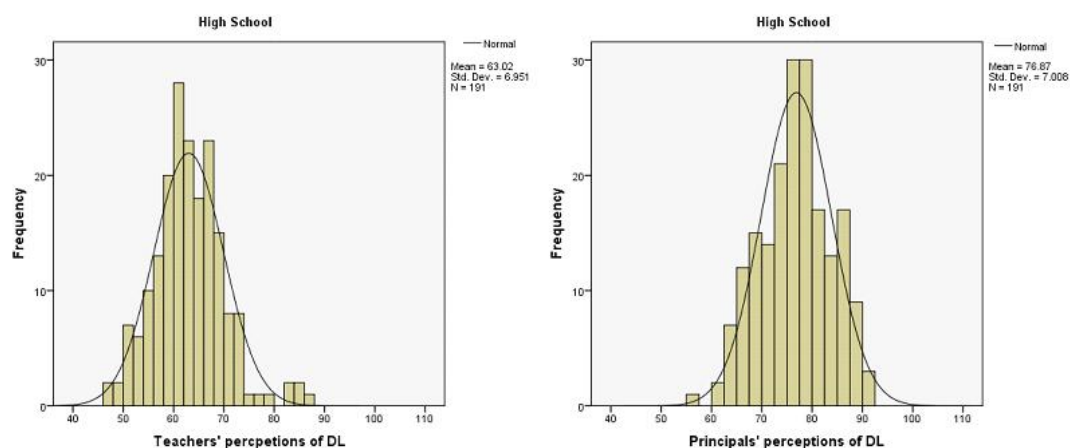
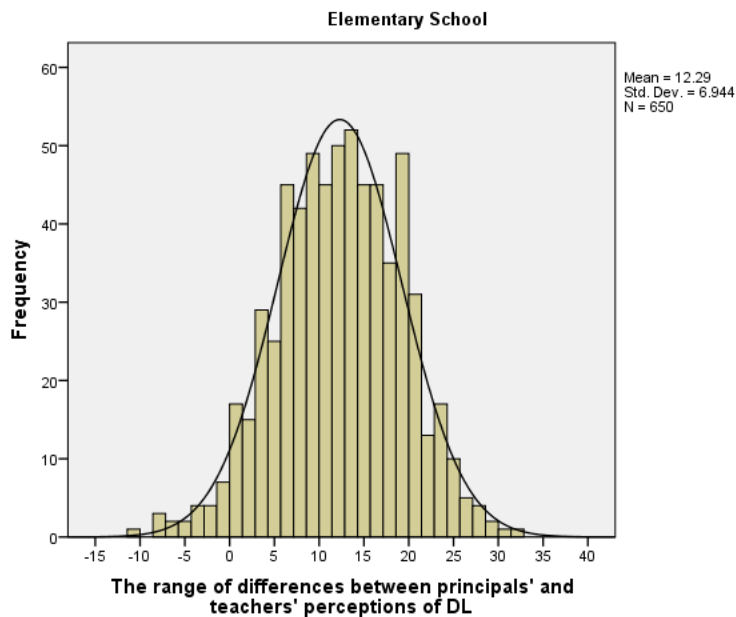


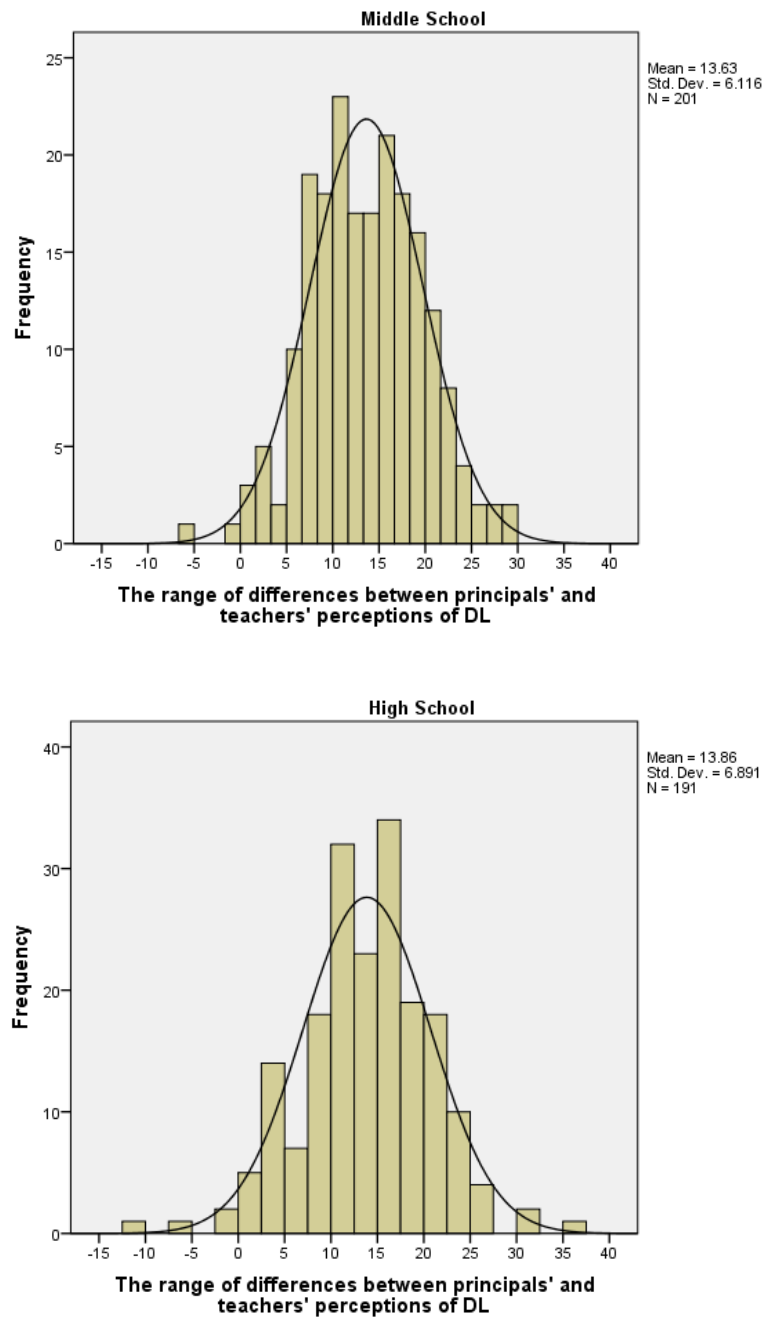
Figure 4. Comparison between Teachers and Principals' perceptions of DL, by school level.

*Table 9. Paired-Samples T tests for principals' and teachers' perceptions of DL, by school level.*

School level		Mean	SD	T	df	p
Elementary (N=685)	Principals	82.4	7.9	-49.1	684	< .001*
	Teachers	65.7	6.8			
Middle (N=232)	Principals	82.7	7.2	-36.5	231	< .001*
	Teachers	63.6	6.8			
High school (N=218)	Principals	81.9	7.6	-29.2	217	< .001*
	Teachers	63.4	7.0			

Figure 5 shows plots of the frequencies of the differences between teachers' and principals' perceptions of DL by school level. Negative values indicate that teachers have higher perceptions of DL in their schools than the principal. Positive values represent principals who perceive their own DL higher than teachers. In short, principals hold substantially more positive perceptions about their distribution of leadership; only in a very small number of schools is there close to no difference between teachers and their principals.





*Figure 4. The range of differences between principals and teachers' perceptions of DL, by school level.*

## Review of results

To summarize, statistically significant correlations between teachers' and principals' perceptions of DL were found in elementary, middle, and high schools. The correlations were strongest in middle schools and weakest in high schools, indicating that the perceptions of DL for teachers and principals were most closely associated in middle school and least closely related in elementary and high schools. In addition, paired-samples t-tests between teacher and principal perceptions were statistically significant in all three types of schools, indicating that teachers and principals hold different perceptions of DL in elementary, middle, and high schools. Specifically, principals generally rated the degree to which they enact DL much more highly than did teachers across all three levels of schooling. Moreover, only in a small number of schools did teachers hold higher perceptions of DL than their principal. Similar perceptions of DL between teachers and principals are also found in a small number of schools. Thus, the results strongly suggest that teachers and principals perceive DL much differently—even in the same school.

### **Research question 2**

To determine the extent to which school context variables (school characteristics, student characteristics, teacher characteristics) explain the variance in teachers' perceptions of DL, I used multiple linear regression. Multiple regression models included three subsets of independent variables: school characteristics, school-level student characteristics, and school-level teacher characteristics. Below, I present the results organized by school level.

#### **Elementary school**

At this level, every subset of school characteristics included in the model were statistically significant at the .05  $\alpha$  level; the set of teacher characteristics ( $F = 61.42, p < .001$ ),

the set of school characteristics ( $F = 193.35, p < .001$ ), and the set of student characteristics ( $F = 185.51, p < .001$ ). Table 10 shows that all three subsets significantly increased the adjusted  $r^2$ ; thus, each set of characteristics included in the model explained a statistically significant change in the variation of teachers' perceptions of DL, above and beyond the other variables included in the model. The variance of teachers' perceptions of DL explained by the three sets of predictors was 11.1%. Thus, variables in these three areas explain about 11% of the variation in teachers' perceptions of DL while 89% of the variation is explained by other factors.

*Table 10. Variance in teachers' perceptions of DL explained by each subset of school context characteristics at elementary school level.*

Model	R	R <sup>2</sup>	Adj. R <sup>2</sup>	SE	R <sup>2</sup> Change	F Change	df1	df2	Sig. F Change
<b>Characteristics</b>									
<b>Teacher</b>	0.130	0.016	0.015	6.457	.016	61.423	5	19298	<.001*
<b>School</b>	0.360	0.099	0.099	6.178	.084	298.555	6	19292	<.001*
<b>Student</b>	0.330	0.111	0.111	6.137	.012	128.344	2	19290	<.001*

\*: Statistically significant at 0.05  $\alpha$  level.

Table 11 presents the regression coefficients for each individual variable within their own group of characteristics and their statistically significant association with teachers' perceptions of DL. From the group of teacher characteristics, only teacher tenure at the school is significantly associated with teachers' perceptions of DL at the .05  $\alpha$  level. Teachers with less than ten years of experience in their current school are associated with lower perceptions of how leadership is distributed ( $B = -0.285, t = -2.654, p = .008$ ), when compared with their peers that have more than ten years working in the same school. With respect to school characteristics, all of the variables are statistically significantly associated with teachers' perceptions of DL at the .05  $\alpha$  level. Specifically, principal gender ( $B = -0.256, t = -2.606, p = .009$ ), tenure at the school ( $B = -0.51, t = -4.049, p < .001$ ), race/ethnicity (Black principals:  $B = -2.86, t = -21.94, p < .001$ ), and principals from other racial/ethnic groups ( $B = 0.867, t = 3.093, p < .001$ ), school size ( $B = -0.007,$

$t = -25.03, p < .001$ ), and if the school met the growth expectation ( $B = 1.74, t = -18.59, p < .001$ ) are significantly related to the way teachers perceive DL. Teachers' perceptions of DL are negatively associated with school size; as school size increases, the perceptions decrease. Further, Black principals with less than ten years of experience working in the school hold lower perceptions of DL compared to their White peers with more than a decade of experience. The opposite happens with principals from other races/ethnic groups, which increases the perception by 0.87, when compared to their white colleagues. Additionally, schools that met growth expectations were also associated with an increase in the perception of DL. Finally, survey response rate ( $B = 0.04, t = 163.227, p < .001$ ) is positively associated with teacher perceptions of DL: the greater the response rate, the greater the teacher perception of DL.

*Table 11. Multiple linear regression for teachers' perceptions of distributed leadership, elementary school (n=733).*

Variable	B	SE	B	t	Sig. (p)	sr <sup>2</sup>
(Constant)	67.936	.416	-	163.227	<.001	-
Survey Response rate	.038	.003	.088	12.919	<.001*	.10
Teacher Black(Reference white)	<.001	.158	<.001	-.002	.998	.11
Teacher Other race	-.389	.268	-.010	-1.454	.146	.11
Teacher female (Reference Male)	.281	.186	.008	1.175	.240	.11
Teacher tenure						
< than 10 years (Reference > 10 years)	-.285	.107	-.018	-2.654	.008*	.11
School size	-.007	<.001	-.195	-25.031	<.001*	.08
School met growth expectation	1.741	.094	0.133	18.593	<.001*	.10
Principal female (Reference Male)	-.256	.098	-.180	-2.606	.009*	.11
Principal tenure						
< than 10 years (Reference > 10 years)	-.510	.126	-.028	-4.049	<.001*	.11
Principal ethnicity						
Black	-2.863	.130	-.169	-21.943	<.001*	.09
Other ethnicity	.867	.280	.022	3.093	.002*	.11
% of students of color	-.009	.003	-.037	-3.406	.001*	.11
% of economically disadvantaged	-.030	.003	-.101	-9.301	<.001*	.11

\*: Statistically significant at 0.05  $\alpha$  level.

$R^2 = 11.1$

Adj  $R^2 = 11.1$ .

Finally, from the subset of student characteristics, both variables are negatively and statistically significantly associated with teachers' perceptions of DL. That is, the percentage of economically disadvantaged students ( $B = -0.03$ ,  $t = -9.3$ ,  $p < .001$ ) and non-White ( $B = -0.01$ ,  $t = -3.406$ ,  $p < .001$ ) students enrolled in the school are associated with lower perceptions of DL.

### **Middle school**

Similar to the results at the elementary school level, every school context group of variables included in the model was statistically significant at the .05  $\alpha$  level: school characteristics ( $F = 98.07$ ,  $p < .001$ ), students' characteristics ( $F = 189.96$ ,  $p < .001$ ), and teacher characteristics ( $F = 190.53$ ,  $p < .001$ ). That is, every set of variables included in the model is significantly associated with teachers' perceptions of DL, above and beyond the other subsets of predictors. Table 12 shows the increment in adjusted  $r^2$  (variance in teachers' perception of DL) explained by the subset of predictors included in the model. The variance of teachers' perceptions of DL explained by the three sets of predictors in the model is 23.2%.

*Table 12. Variance in teachers' perceptions of DL explained by each subset of school context characteristics at middle school level.*

Model	R	R <sup>2</sup>	Adj. R <sup>2</sup>	SE	R <sup>2</sup> Change	F Change	df1	df2	Sig. F Change
<b>Characteristics</b>									
<b>Teacher</b>	.238	.057	.056	6.386	.057	98.073	5	8173	<.001*
<b>School</b>	.451	.204	.203	5.869	.147	251.494	6	8167	<.001*
<b>Student</b>	.482	.233	.232	5.762	.029	154.410	2	8165	<.001*

\*: Statistically significant at 0.05  $\alpha$  level.

Table 13 presents the regression coefficients for each individual variable and their statistical associations with teachers' perceptions of DL. From the subset of school characteristics, all variables are statistically significant at the .05  $\alpha$  level. Further, school size is associated with lower perceptions of DL; as school size increases, teachers' perception of DL

decreases ( $B = -27.37, p < .001$ ). In the same way, teachers in schools that met the expected academic growth hold more positive perceptions of DL than do teachers in schools that have not met expected academic growth ( $B = 1.78, t = 12.343, p < .001$ ). With respect to the race/ethnicity of the principal, teachers in schools with a Black principal hold more negative perceptions about DL than do teachers in schools with a White principal ( $B = -1.56, t = -8.74, p < .001$ ). With respect to principal tenure at the school, teachers in schools in which the principal has less than 10 years of experience in the school hold more negative perceptions of DL than teachers in schools in which the principal has 10 or more years of experience at the school. With respect to the gender of the principal, teachers in schools with a female principal hold more negative perceptions of DL than do teachers in schools with a male principal. Finally, similar to the findings for the elementary school level, the teacher response rate to the survey was positively associated with teacher perceptions of DL ( $B = 0.07, t = 17.93, p < .001$ ).

*Table 13. Multiple linear regression for teacher perceptions of distributed leadership, middle school level. (n= 246).*

Variable	B	SE	B	t	Sig. (p)	sr <sup>2</sup>
(Constant)	70.672	.605	-	116.862	<.001	-
Survey Response rate	.072	.004	.179	17.927	<.001*	0.20
Teacher Black(Reference white)	-.344	.191	.019	-1.798	.072	0.23
Teacher Other race	.089	.336	.003	.264	.792	0.23
Teacher female (Reference Male)	-.128	.149	-.008	-.859	.390	0.23
Teacher tenure						
< than 10 years (Reference > 10 years)	.077	.170	.004	.456	.649	0.16
School size	-.009	<.001	-.326	-27.373	<.001*	0.22
School met growth expectation	1.781	.144	.134	12.343	<.001*	0.23
Principal female (Reference Male)	.364	.131	.028	2.780	.005*	0.20
Principal tenure						
< than 10 years (Reference > 10 years)	-4.281	.223	-.188	-19.187	<.001*	0.23
Principal ethnicity						0.23
Black	-1.566	.179	-.097	-8.749	<.001*	0.22
Other ethnicity	2.002	.477	.042	4.201	<.001*	0.20
% of students of color	<.001	.005	.001	.069	.945*	0.23
% of economically disadvantaged	-.081	.006	-.231	-12.784	<.001*	0.23

\*: Statistically significant at 0.05  $\alpha$  level.

$$R^2 = 0.232$$

$$\text{Adj } R^2 = 0.233$$

In contrast to what happens at the elementary school level, the proportion of students of color enrolled in the school is not significantly associated with teachers' perceptions of DL at the middle school level. The proportion of economically disadvantaged students, on the other hand, is associated with lower perceptions of DL; when there are more economically disadvantaged students, the perception decreases ( $B = -.81$ ,  $t = -12.78$ ,  $p < .001$ ). Finally, from the subset of teacher characteristics, neither teachers' gender, ethnicity, nor tenure at the school are statistically significant at the .05  $\alpha$  level.

### High school

Similar to the previous results, each subset of school context characteristics included in the model was significantly associated with teachers' perceptions of DL in high school, including the subset of school characteristics ( $F = 165.168$ ,  $p < .001$ ), the subset of student characteristics variables ( $F = 158.342$ ,  $p < .001$ ), and the subset of teacher characteristics ( $F = 45.474$ ,  $p < .001$ ). Table 14 shows that all three models yield a statistically significant increase in the adjusted  $r^2$ . This means that every set of variables included in the model is statistically significantly associated with teachers' perceptions of DL, above and beyond the other sets of predictors in the model. The variance on teachers' perception of DL explained by the three sets of predictors was 17.7%.

*Table 5. Variance in teachers' perceptions of DL explained by each subset of school context characteristics at the high school level ( $n = 238$ ).*

Model	R	$R^2$	Adj. $R^2$	SE	$R^2$ Change	F Change	df1	df2	Sig. F Change
<b>Characteristics</b>									
<b>Teacher</b>	.153	.023	.023	5.59911	.023	45.474	5	9488	<.001*
<b>School</b>	.401	.161	.160	5.19197	.137	258.736	6	9482	<.001*

<b>Student</b>	.422	.178	.177	5.13777	.018	101.540	2	9480	<.001*
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\*: Statistically significant at 0.05  $\alpha$  level.

Table 15 shows the regression coefficients for each individual variable in the models and their statistical significance with teachers' perceptions of DL at the .05  $\alpha$  level. From the subset of teacher characteristics, only Black teachers are not statistically associated with teachers' perceptions of DL. Teachers working in the same high school for less than ten years ( $B = 2.68$ ,  $t = 2.115$ ,  $p$  - value = .034) have higher perceptions of DL when compared with their peers with more than ten years of tenure. Similarly, when teachers are from other race/ethnic group ( $B = .563$ ,  $t = 2.11$ ,  $p$  - value = .035), and female ( $B = .215$ ,  $t = 1.962$ ,  $p$  - value = .05) the perceptions of DL increase. High school is the only level in which teachers' characteristics are associated with their perceptions of leadership distribution in their schools.

*Table 15. Multiple linear regression for teacher perceptions of distributed leadership, high school level. (n= 237).*

Variable	B	SE	B	t	Sig. (p)	$sr^2$
(Constant)	65.961	.381	-	172.925	<.001	-
Survey Response rate	.032	.003	.103	10.887	<.001*	0.17
Teacher Black(Reference white)	-.055	.176	-.003	-.313	.754	0.18
Teacher Other race	.563	.267	.021	2.112	.035*	0.18
Teacher female (Reference Male)	.215	.109	.018	1.962	.050*	0.18
Teacher tenure						
< than 10 years (Reference > 10 years)	.268	.127	.020	2.115	.034*	0.12
School size	-.003	<.001	-.323	-26.881	<.001*	0.16
School met growth expectation	1.453	.113	.127	12.835	<.001*	0.18
Principal female (Reference Male)	-.549	.118	-.045	-4.637	<.001*	0.16
Principal tenure						
< than 10 years (Reference > 10 years)	-1.916	.130	-.141	-14.727	<.001*	0.16
Principal ethnicity						0.18
Black	-1.932	.165	-.129	-11.733	<.001*	0.17
Other ethnicity	6.050	.464	.135	13.050	<.001*	0.17
% of students of color	-.009	.004	-.037	-2.239	.025*	0.18
% of economically disadvantaged	-.048	.006	-.132	-8.058	<.001*	0.18

\*: Statistically significant at 0.05  $\alpha$  level.

$R^2 = 0.178$

Adj  $R^2 = 0.177$

At the high school level, all school characteristics are statistically associated with teachers' perceptions of DL at the .05  $\alpha$  level. School size, principal's gender, ethnicity, and tenure at the school are associated with lower perceptions of DL. School size is associated with lower perceptions of DL; as school size increases, teachers' perception of DL decreases 0.003 ( $t = -26.88, p < .001$ ). With respect to the race/ethnicity of the principals, teachers in schools with a Black principal hold more negative perceptions about DL than do teachers in schools with a White principal ( $B = -1.9, t = -11.73, p < .001$ ). With respect to principal's tenure at the school, teachers in schools in which the principal has less than 10 years of experience in the schools have more negative perceptions of DL than do teachers in schools in which the principal has more than 10 years ( $B = -1.9, t = -14.72, p < .001$ ). With respect to the gender of the principal, teachers in schools with a female principal hold more negative perceptions of DL than teachers in schools with a male principal ( $B = -0.549, t = -4.637, p < .001$ ). Finally, survey response rate, as was the case at the elementary and middle school levels, is statistically significant at high school level. The greater the survey response rate, the greater teachers' perception of DL ( $B = 0.03, t = 10.887, p < .001$ ).

Finally, from the subset of student characteristics, the proportions of students of color and economically disadvantaged students enrolled in the school are associated with lower perceptions of DL. Similar to the findings for elementary and middle school levels, DL perception decreases as the percentage of economically disadvantaged students enrolled ( $B = -0.048, t = -8.06, p < .001$ ) and the percentage of students of color increase ( $B = -0.09, t = -2.23, p = .025$ ).

## **Review of Results**

In sum, there is a statistically significant effect of school, student, and teacher characteristics on teachers' perceptions of DL at the three levels of schooling. However, the extent to which these characteristics explain a statistically significant proportion of the variance in teachers' perceptions of DL depends on the level of schooling. In elementary school, the percentage of variance explained is smaller (11%) than the percentages in middle (23%) and high school (17.8%). In other words, when considered as a group, all the variables included in this analysis: teacher characteristics (gender, race/ethnicity, and tenure), student level characteristics (% of students of color and % of economically disadvantaged students), and school characteristics (school size, met expected growth, and principals' gender, race/ethnicity, tenure) have a different impact on the way teachers perceive DL in their elementary-, middle-, and high schools. In elementary school, these characteristics have a smaller impact on the way teachers view leadership distribution in their schools. This implies that other school characteristics not included in this analysis may be more influential in the way teachers perceive DL. Further, in middle and high schools, the same characteristics have a greater impact on teachers' perception of DL.

When considered individually, on the other hand, only some of the aforementioned school characteristics have the same effect on teachers' perceptions of DL at all levels of schooling. Among these characteristics are: school size, whether a school met the expected growth, and survey response rate. This indicates that teachers in relatively larger schools tend to have lower perceptions of DL when compared to their peers in relatively smaller schools. If the school, however, met the expected academic growth the previous year, teachers held higher perceptions than when the school did not meet the expected growth. Teachers that have higher survey response rates are more likely to report greater perceptions of how school leadership is

distributed in their schools, indicating that teachers with higher perceptions provide more information in the surveys.

Other characteristics that were consistently associated with how teachers perceive DL in their elementary, middle and high schools were principal tenure at the school and principals' race/ethnic group. Teachers that work with White principals with more than ten years of tenure perceive more leadership distribution in their schools. Also, more experienced principals from other race/ethnic groups seem more likely to enact DL much more highly than Black principals with less than ten years in their schools do.

On the other hand, there are other characteristics included in this analysis for which the effect on teachers' perceptions of DL varies by school level. Teachers working with female principals in elementary and high schools perceive less enactment of DL in their schools than teachers in middle school. Teachers with lower levels of tenure have lower perceptions in elementary school than they do in high school. Moreover, only in high school female and teachers from other race/ethnic groups hold higher perceptions DL.

Finally, the percentage of economically disadvantaged students enrolled in elementary-, middle-, and high- schools are negatively associated with how teachers perceive leadership distribution within their schools, indicating that DL is less likely enacted in schools with low SES. Moreover, in elementary and high schools with higher number of students of color enrolled, teachers are less likely to perceive DL as well.

### **Research question 3**

I used stepwise logistic regression to answer RQ3, which seeks to examine the effect of teachers' perceptions of DL on teacher attrition. Logistic regression is an appropriate methodological approach because the variable of interest—a teacher's stated intentions about

leaving his/her school—is binary. Specifically, a teacher either indicates that he/she does intend to leave the school (turnover = 1) or does not intend to leave the school (turnover = 0). The following tables show the logistic regression coefficients, which represent the expected change in log odds of teachers leaving their jobs, for a one-unit increase in teachers' perceptions of DL at elementary-, middle-, and high- schools. This stepwise logistic regression analysis included all previously mentioned school characteristics (school, teacher, and student variables) plus an additional variable that assesses the difference in perceptions of DL between teacher and her/his principal, as covariates.

### Elementary school

*Table 6. Regression coefficients and odds ratios for factors associated with teacher turnover, in elementary school (n = 17088).*

Variable ( <i>Full model</i> )	B	SE	Wald $\chi^2$	df	Sig. ( <i>p</i> )	Exp (B)
Constant	1.628	.450	13.077	1	<.001	5.094
DL diff between teachers and principal	-.007	.004	2.826	1	.093	.993
Survey response rate	.002	.002	.991	1	.320	1.002
Teachers						
<b>Perception of DL</b>	<b>-.058</b>	<b>.004</b>	<b>171.117</b>	<b>1</b>	<b>&lt;.001*</b>	<b>.943</b>
Gender (Female reference group)	.115	.108	1.124	1	.289	1.121
Black (White reference group)	.034	.094	.132	1	.716	1.035
Other race	-.148	.105	2.003	1	.157	.862
Tenure at the school (>10 reference group)	-.201	.071	8.088	1	.004*	.818
Principal						
Gender (Female reference group)	-.285	.060	22.414	1	<.001*	.752
Black (White reference group)	.005	.069	.006	1	.939	1.005
Other race	-.073	.156	.220	1	.639	.930
Tenure at the school (> 10 reference group)	-.227	.078	8.534	1	.003*	.797
School size	<.001	<.001	4.926	1	.026	1.000
School met expected growth	-.041	.055	.568	1	.451	.960
% of students of color enrolled	.008	.002	27.524	1	<.001*	1.008
% of economically disadvantaged	-.001	.002	.472	1	.492	.999

\*: Statistically significant at 0.05  $\alpha$  level.

Chi-square ( $df=15$ ) = 456.047,  $p < .001$ \*

In order to determine if teachers' perceptions of DL is a statistically significant independent factor associated with teacher turnover, I used the likelihood ratio test for significance of a single predictor (Cohen et al., 2013). The likelihood ratio test examines the difference between the -2 Log likelihood-estimation from the *full* model and the -2 Log likelihood-estimation from the *reduced* model (without teachers' perceptions of DL). In this case, the full model consists of all the covariates; while the reduced model includes every covariate but teachers' perceptions of DL. The statistical significance of this test follows an approximately normal Chi-square distribution ( $df = 1$ , critical value  $> 3.84$  (Cohen et al., 2013)).

*Table 17. -2 Log likelihood estimates for likelihood ratio test, at elementary school.*

Model	-2 Log likelihood	Chi-square	$df$	Sig. (critical value $> 3.84$ )	Hosmer & Lemeshow Test
Full model	11185.719	173.288	1	$> 3.84^*$	.969*
Reduced model (without teachers' perception of DL)	11359.007				

\*: Not statistically significant at 0.05  $\alpha$  level.

Table 17 shows the -2 Log likelihood estimates for both full and reduced models. The likelihood ratio test suggests that teachers' perceptions of DL is statistically significantly associated with teacher turnover over and above survey response rate, difference between teachers' and principals' perceptions of DL, school, students, and teachers' characteristics included in this study. That is, for every one-unit increase in teachers' perceptions of DL, we expect to see a decrease in the odds of teachers leaving their school in the next year. Thus, the odds of an elementary school teacher with higher perceptions of DL leaving his/her job are 0.935; holding all the characteristics included in the model constant the odds of a teacher leaving his/her job decreases as the teachers' perceptions of DL increases even after holding teacher, school, and student characteristics constant. The Hosmer & Lemeshow test for model goodness-of-fit suggests the model is a good fit for the data (Chi-square  $_{(8)} = 2.342$ ,  $p = 0.969$ ).

## Middle school.

In order to determine if teachers' perceptions of DL is a significant unique factor associated with teacher turnover over and above teacher, student, and school characteristics in middle school, I followed the same procedure previously described. Table 18 shows the regression coefficients for teachers' perceptions of DL and for the other covariates in the model. The likelihood ratio test was used to test the statistical significance of perception of DL as a single factor (Cohen et al, 2013).

*Table 18. Regression coefficients and odds ratios for factors associated with teacher turnover, in middle school (n=6710).*

Variable ( <i>Full model</i> )	B	SE	Wald $\chi^2$	df	Sig. ( <i>p</i> )	Exp (B)
Constant	1.384	.700	3.909	1	.048*	3.991
DL diff between teachers and principal	-.010	.006	2.537	1	.111	-.990
Survey response rate	<.001	.002	<.001	1	.990	1.000
Teachers						
<b>Perception of DL</b>	<b>-.067</b>	<b>.007</b>	<b>96.936</b>	<b>1</b>	<b>&lt;.001*</b>	<b>.935</b>
Gender (Female reference group)	.125	.090	1.947	1	.163	1.134
Black (White reference group)	.145	.113	1.649	1	.199	1.157
Other race	-.032	.122	.068	1	.794	.969
Tenure at the school (>10 reference group)	-.056	.099	.319	1	.572	.946
Principal						
Gender (Female reference group)	-.022	.075	.083	1	.773	.979
Black (White reference group)	-.005	.094	.002	1	.961	.995
Other race	.204	.308	.438	1	.508	1.226
Tenure at the school (> 10 reference group)	-.050	.138	.132	1	.716	.951
School size	<.001	<.001	1.774	1	.183	1.000
School met expected growth	-.082	.084	.958	1	.328	.921
% of students of color enrolled	.006	.003	6.059	1	.014*	1.006
% of economically disadvantaged	.003	.004	.865	1	.352	1.003

\*: Statistically significant at 0.05  $\alpha$  level.

Chi-square (df= 12) = 245.674,  $p < .001^*$ )

Table 19 presents the -2 Log likelihood estimates, which were used to test the unique variance explained by DL. As mentioned before, the likelihood ratio test examines the difference between the -2 Log likelihood-estimation from the *full* model and the -2 Log likelihood-estimation from the *reduced* model (without teachers' perception of DL). In this case, the full

model consists of all school context characteristics as covariates, while the reduced model includes every covariate but teachers' perceptions of DL. The statistical significance of this test follows an approximately normal Chi-square distribution ( $df = 1$ , critical value  $> 3.84$  (Cohen et al, 2013)).

*Table 19. -2Log likelihood estimates for likelihood ratio test, at middle school.*

Model	-2 Log likelihood	Chi-square	$df$	Sig. (critical value $> 3.84$ )	Hosmer & Lemeshow Test
Full model	5487.437	100.021*	1	$> 3.84$	0.64
Reduced model (without teachers' perception of DL)	5587.458				

\*: Not statistically significant at 0.05  $\alpha$  level.

Table 19 shows the -2 Log likelihood estimates for both full and reduced models. The likelihood ratio test suggests that teachers' perceptions of DL (Chi-squared ( $df=1$ ) = 100.021, critical value  $> 3.84$ ) is statistically significantly associated with teacher turnover over and above survey response rate, difference between teachers' and principals DL perceptions, and school, student, and teacher characteristics included in the model. That is, for every one-unit increase in teachers' perceptions of DL, we expect to see a decrease in the odds of teachers leaving their school the next year. The odds of a middle school teacher with higher perceptions of DL leaving his/her job are 0.935, holding all the characteristics included in the model constant. The Hosmer & Lemeshow test for model goodness-of-fit suggests a good fit of the data (Chi-square  $(8) = 165.6$ ,  $p = 0.64$ ).

### **High school**

Finally, I followed the same process to determine if teachers' perceptions of DL is a significant unique factor associated with teacher turnover over and above teacher, student, and school characteristics in high school. Table 20 presents the regression coefficients for teachers'

perceptions of DL and for the other covariates in the models. The likelihood ratio test was used to test the statistical significance of perception of DL as a single factor (Cohen et al, 2013).

*Table 7. Regression coefficients and odds ratios for factors associated with teacher turnover, in high school (n=8818).*

Variable ( <i>Full model</i> )	B	SE	Wald $\chi^2$	df	Sig. ( <i>p</i> )	Exp (B)
Constant	.178	.722	.060	1	.806	1.194
DL difference between teachers and principal	-.009	.006	2.157	1	.142	.991
Survey response rate	<.001	.002	.023	1	.879	1.000
Teachers						
<b>Perception of DL</b>	<b>-.055</b>	<b>.007</b>	<b>60.004</b>	<b>1</b>	<b>&lt;.001*</b>	<b>.947</b>
Gender (Female reference group)	.177	.072	5.977	1	.014*	1.193
Black (White reference group)	-.001	.121	.000	1	.996	.999
Other race	.087	.146	.357	1	.550	1.091
Tenure at the school (>10 reference group)	-.204	.102	3.997	1	.046*	.815
Principal						
Gender (Female reference group)	-.155	.072	4.628	1	.031*	.857
Black (White reference group)	-.188	.104	3.251	1	.071	.829
Other race	.766	.367	4.344	1	.037*	2.150
Tenure at the school (> 10 reference group)	.069	.086	.640	1	.424	1.072
School size	<.001	<.001	1.798	1	.180	1.000
School met expected growth	-.074	.074	.999	1	.317	.929
% of students of color enrolled	.003	.003	1.105	1	.293	1.003
% of economically disadvantaged	.008	.004	4.404	1	.036*	1.194

\*: Statistically significant at 0.05  $\alpha$  level.

Chi-square (df=12) = 750.64,  $p < .001$ \*)

Table 21 presents the -2 Log likelihood estimates used to test the unique variance explained by DL (Chi-square (df=1) = 61.33,  $p > 3.84$ ). The results suggest a statistically significant association between DL and teacher turnover over and above school, student, and teacher characteristics included in this study. Therefore, for one-unit increase in teachers' perception of DL, we expect to see a decrease in the odds of teachers leaving their school the next consecutive year. The odds of a high school teacher with high perceptions of DL of leaving his/her job are 0.95, holding teachers, school and student characteristics in the model constant.

The Hosmer & Lemeshow test for model goodness of fit suggests that the model is a good fit for the data (Chi-square<sub>(8)</sub> = 0.825,  $p = 0.95$ ).

*Table 21. -2Log likelihood estimates for likelihood ratio test, at high school.*

Model	-2 Log likelihood	Chi-square	df	Sig. (critical value > 3.84)	Hosmer & Lemeshow Test
Full model	6320.075	61.33*	1	>3.84	.825
Reduced model (without teachers' perception of DL)	6381.405				

\*: Not statistically significant at 0.05 level.

## Review of results

As shown above, there is a significant effect of teachers' perceptions of DL on their stated intentions to leave their jobs at every level of schooling. In other words, the greater a teacher's perception of DL, the lower the odds that a teacher would state her/his intentions to leave the school. Importantly, this finding holds after controlling for the influence of a variety of other factors that are associated with teacher turnover. There were not any findings—other than that of DL— that were consistent across all three school levels. There were, however, other findings that were statistically significant at both the elementary school level and the high school level. Teachers in elementary and high schools with less than 10 years of tenure in the school are less likely to express their intentions to leave their schools than teachers with more than 10 years of tenure. Similar results hold for teachers working in schools with female principals. Elementary and high school teachers are less likely to express their intentions to leave their jobs when they work with a female principal, and more likely to leave their schools when the principal is male. With respect to principal's tenure, elementary school teachers are less likely to express their

intentions of leaving their schools when the principal has less than 10 years of tenure. Thus, the odds of teachers leaving their schools increase when the principal has more than 10 years of tenure in the school. Further, female high school teachers are more likely to express their intentions to leave their schools compared to their male peers. With respect to the principal's race/ethnicity, only teachers in high schools with principals from "other race" are more likely to express their intentions to leave their schools, when compared to teachers in schools with White principals. Finally, with respect to students' characteristics, elementary and middle school teachers are more likely to express their intentions to leave their schools when the proportion of students of color increases. In other words, as the number of students of color increases in elementary and middle schools, the more likely the teachers are to express their intentions to leave their schools. Finally, with respect to the proportion of economically disadvantaged students enrolled in the schools, only high school teachers are more likely to express their intentions to leave their schools as the number of economically disadvantaged students in the school increases.

### **Overall summary**

In this study, the purpose was three-fold. I examined the following: first, the degree of congruence in how teachers and principals perceive DL in the same school; second, the degree to which school characteristics influence teacher perceptions of DL; and, third, the relationship between DL and teacher intentions to remain employed in the same school, while controlling for differences in teachers and principals perceptions of DL and all the school characteristics included in the analysis.

When exploring the degree to which teachers and principals have similar perceptions of DL, the results of this study showed that the degree of association between teachers' and

principals' perceptions of DL was statistically significant and positive in elementary, middle, and high schools. The perceptions were strongly correlated in middle schools and weakly correlated in elementary and high schools. This indicates that teachers' and principals' perceptions of DL were most closely associated in middle school and the least closely related in elementary and high schools. In addition, school-level paired-samples t-tests between teacher and principal perceptions were statistically significant in all three types of schools. This indicates that teachers and principals hold different perceptions of DL in elementary, middle, and high schools.

Principals generally rated the degree to which they enact DL much more highly than did teachers across all three levels of schooling. Further, only in relatively few schools did teachers hold higher perceptions of DL than their principal. Similarly, only in a few schools were the perceptions of DL between teachers and principals comparable. These results strongly suggest that teachers and principals perceive DL much differently—even in the same school, with principals perceiving greater levels of DL enactment than their teachers in schools at all three levels of schooling.

Second, when assessing the degree to which teacher perceptions of DL in this particular data set are associated with school characteristics, the results of this analysis reveal that school-, student-, and teacher- characteristics are statistically significantly associated with teachers' perceptions of DL at the three levels of schooling. These characteristics explained a statistically significant change in the variance of teachers' perception of DL. At the elementary school level, the percentage of variance explained is less than the percentages in middle and high school. In other words, when I group all of the individual variables into the three groups designated as teacher characteristics, student level characteristics, and school characteristics, all three groups of variables are statistically significantly associated with the way teachers perceive DL in

elementary-, middle-, and high schools. The impact of these characteristics in explaining the teacher perception of DL is, however, lower in elementary school. This implies that other school characteristics not included in this analysis may have a stronger relationship with teacher perceptions of DL at the elementary school level than at the middle- or high- school levels.

When school characteristics are considered individually, only some variables have a consistent effect on teachers' perceptions of DL in all three types of schools. Among these characteristics are: school size, school met the expected academic achievement growth, survey response rate, principal tenure at the school, principals' race/ethnic group, and the percentage of economically disadvantaged students. More specifically, the results indicate teachers in relatively larger schools tend to have lower perceptions of DL than their peers in smaller schools. Moreover, if the school met the expected academic growth the previous year, teachers hold higher perceptions than when the school did not meet the expected growth. Similarly, teachers in schools with greater survey response rates report greater perceptions of DL in their schools. With respect to principals' tenure and race, the results of this study suggest teachers who work with White principals with more than ten years of tenure have greater perceptions of DL in their schools. Also, principals with more than ten years of tenure from other racial/ethnic groups seem more likely to enact DL to a greater extent than Black principals with less than ten years in their schools do. Finally, the percentage of economically disadvantaged students enrolled in the school is negatively associated with how teachers perceive leadership distribution within their schools. This suggests that DL is enacted to a lesser degree in schools with low SES.

There were other characteristics included in this analysis for which the effect on teachers' perceptions of DL varies by school level. Elementary and high school teachers working with female principals perceive less enactment of DL in their schools than do teachers in middle

school. Teachers with less than ten years of tenure hold lower perceptions of DL in elementary schools than they do in high school. Moreover, only in high schools do female teachers and teachers from other racial/ethnic groups hold greater perceptions of DL. Further, the percentage of students of color enrolled in the school was negatively associated with teacher perceptions of DL. In elementary- and high- schools with greater proportions of students of color enrolled, teachers hold lower perceptions of DL relative to schools with lower proportions of students of color. With respect to the effect of teachers' perceptions of DL on their stated intentions to leave their jobs, I found statistically significant relationships at all three school levels even after controlling for other factors associated with teacher attrition. This indicates that the greater a teacher's perception of DL, the lower the odds that the teacher would state her/his intention to leave the school during the subsequent year. Notably, these findings held after controlling for the influence of a variety of other factors associated with teacher turnover. Teacher's perception of DL was the only factor consistent across all three school levels. Similarl to the aforementioned results, the effect of some characteristics varies depending on the level of schooling. Among these characteristics are: teacher gender and teacher tenure at the school, principals' gender and race/ethnicity, the percentage of students of color, and the percentage of economically disadvantaged students. Teachers in elementary- and high- schools with less than 10 years of tenure are less likely to express their intentions to leave their schools. Similarly, elementary and high school teachers working in schools with female principals are less likely to express their intentions to leave their jobs. With respect to principal's tenure; elementary school teachers are less likely to express their intentions of leaving their schools when the principal has less than 10 years of tenure, indicating that the odds of teachers leaving their schools increase when the principal has more than 10 years of tenure in the school. Further, male high school teachers are

less likely to express their intentions to leave their schools compared to their female peers. With respect to the principal race/ethnicity, only teachers in high schools with White principals are less likely to express their intentions to leave their schools, when compared to teachers in schools with principals from other race.

Finally, with respect to students' characteristics, as the proportion of students of color increases, elementary- and middle- school teachers are more likely to express their intentions to leave their schools. This indicates that as the number of students of color increases in elementary and middle schools, teachers are more likely to express their intentions to leave their schools. Moreover, only high school teachers are more likely to express their intentions to leave their schools as the number of economically disadvantaged students in the school increases. Chapter 5 presents a discussion section, implications, and recommendations for future research based on these findings.

## **Chapter 5**

### **Discussion**

Currently, researchers argue that DL is very important for an effective teaching-learning process in the school. DL is defined as the interaction between leaders and teachers and the situation in which these interactions take place (e.g. Gronn, 2002; Spillane et al., 2001). Therefore, DL is an organizational property that embraces the interdependence between social and situational characteristics in the school. DL does not imply simply the delegation of leadership functions, but rather the distribution of responsibilities for leading and managing the schools to multiple individuals in both formal and informal leadership positions designated by the principal. In short, in a school with DL, leadership roles and responsibilities are enacted by different members of the organization at different times (Spillane et al., 2007), taking into account particular contexts and circumstances as key components in understanding how leadership distribution takes place in schools (Bolden, 2011; Gordon, 2010; Spillane et al., 2004, 2015).

Given the rapid increase in the demands placed on principals, school leaders must rely on the collective effort of many more members of the school to achieve educational goals (Devos et al., 2014; Hulpia et al. 2012; Spillane, 2015; Urick, 2016). DL is considered an alternative strategy to respond productively and effectively to the challenges that school leaders face currently because it reduces the overall workload of the principal, increases organizational commitment (Devos et al., 2014), and positively influences educational outcomes (Heck & Hallinger, 2009; Robinson et al., 2008). DL has become a very prevalent approach among researchers, policy makers, educational reformers, and leadership practitioners alike to identify

effective leadership sources (e.g. Devos et al, 2014; Hammerley-Fletcher & Brundrett, 2005, Robinson et al., 2008; Urick, 2016),

One aspect of school leadership that has important effects on the ability of the school to improve student outcomes is the retention of teachers, particularly teachers considered to be effective. Indeed, researchers have found that teacher retention has a positive effect on student outcomes, even after considering the effectiveness of the teachers leaving and staying at the school (Hanushek, Rivken, & Schiman, 2016; Ronfeldt, Loeb, & Wyckoff, 2013). Teacher retention is a challenge for school administrators in the United States, particularly in large urban districts (Jacob, 2007). Despite the recent interest in both DL and teacher retention, there is a severe paucity of research that examines the two issues concomitantly. Therefore, the purpose of this study was three-fold: to examine the degree of congruence in how teachers and principals perceive DL in the same school; the degree to which school characteristics influence teacher perceptions of DL; and the relationship between DL and teacher intentions to remain employed in the same school.

First, with the intent of developing a deeper understanding of DL I explored the degree to which teachers and principals have similar perceptions of DL. This was an inherently interesting purpose because limited extant research suggests that teachers and principals view leadership behaviors differently but there are currently no published studies that examine the degree to which teachers and principals perceive DL in the same way. Second, I examined the degree to which teacher perceptions of DL in this particular data set are associated with school characteristics such as school size, survey response rate, proportion of students of color and proportion of economically disadvantaged students enrolled in the school. Additionally, teachers' and principals' race/ethnicity, gender, and tenure in the school were included. This particular

research question was undertaken specifically to determine the extent to which educator and school characteristics are associated with teacher perceptions of DL to inform the analysis employed to answer research question 3. The third purpose was to examine whether teacher perceptions of DL influence an important outcome relative to teacher and school effectiveness—teacher intentions to remain employed at the same school.

In line with the three-fold purposes of this study, this chapter presents the findings for the three research questions of this study. The first research question examined the relationship between teachers and principals' perceptions of DL in North Carolina public schools. The second research question determined the degree to which school contextual characteristics (school-, student-, and teacher- characteristics) affect how teachers perceive DL. Finally, the third research question analyzed the extent to which teachers' perception of DL affects teacher turnover.

### **Relationship between teacher and principal perceptions of DL**

The role of the school principal within a DL approach to leadership is no longer one of absolute authority but of the sharing of power, incentivizing active participation in decision making, and allocating resources that allow school personnel to interact and learn from each other. Therefore, the new role of the principal is no longer to lead the school by him/herself, but to create the conditions for other to lead as well. This does not suggest that the principal is no longer the person who sets the strategic direction in the school, but rather that s/he has to incentivize the development of leadership capacity of others and talent so the school can move forward and achieve better student outcomes. The results of this study suggest that although teachers and principals share a common feeling of how leadership functions are being performed, the amount and quality of cohesive teamwork, and teachers' active participation within their

schools, teachers perceive DL significantly differently from how their principals report leadership distribution in the same school.

However, the results of this study present evidence showing that teachers and principals have very different perceptions of DL in their schools. In other words, principals perceive their ability to enact DL in a much more positive way than teachers. Only in 21.5% of schools was the difference between principal perceptions and teacher perceptions of DL within 3 percentage points of zero. Thus, in most schools, teachers and principals do not perceive DL similarly. While one would expect principals to have more positive perceptions of their own leadership compared to teacher perceptions of the principal's behavior (Urick & Bowers, 2010), the large differences found in this study underscore the vast chasm in perceptions between principals and teachers about the behavior of the principal. This strongly suggests the need for principals to gather the perceptions of teachers to inform their own perceptions of their own leadership behavior.

Even though research shows advantages of enacting DL, the adoption and enactment of DL may be difficult. Factors such as internal organizational structure, culture, departmental divisions, and training can make the implementation of DL relatively difficult in schools. The findings of this study raise an important question about how teachers understand DL in schools and what principals should do in this regard. Principals need to acknowledge that what they do and how they do it is more important than the role they occupy.

Principals need to first overcome the difficulties of sharing power with others in their schools without feeling threatened or vulnerable because they do not directly control certain activities anymore. Second, they should develop their ability to recognize potential leaders among the staff. Third, principals should retain these informal leaders by incentivizing and

rewarding staff who have taken leadership responsibilities. Finally, principals should actively communicate their vision for leadership distribution and also enhance communication within the school, specifically among teachers who might be prevented from taking extra responsibilities for belonging or not to a specific group of teachers. By communicating principals DL approach and incentivizing communication among school personnel, principals can also ensure that teachers do not interpret DL as a delegation of tasks, but as collaboration among members that share a common goal.

Currently, there is no available empirical evidence of why teachers and principals may perceive DL differently within their schools. Unfortunately, until there is a way to examine and reduce the differences of how principals and teachers perceive DL in their schools, it may be preferable to select either teachers' or principals' perspectives of DL when conducting research. Therefore, it is important to remember that the selection of the participants (either teacher or principal) should depend on the research purpose (Spillane and Healey, 2010).

### **The effect of school context characteristics on teachers' perceptions of DL**

This section of the study focused on providing evidence about the school-, student-, and teacher- characteristics that might affect the way teachers perceive DL in their schools. Beyond making inferences about whether DL is higher or lower in specific schools, this section provided a better understanding of how perceptions of DL are associated with school contextual factors in order to better understand the variables necessary to include in the analysis regarding research question three.

The results show that all three sets of school characteristics included in this analysis affect teachers' perceptions of DL in North Carolina elementary-, middle-, and high- schools. Nevertheless, the extent to which these groups of characteristics influence teacher perceptions of

DL is different at all three levels. At the elementary school level, these characteristics have less of an impact on the way teachers view leadership distribution in their schools relative to teachers in middle- or high- schools. It is always possible that the variations of the impact these groups of characteristics have on teachers' perceptions of DL are due to unobserved school characteristics. Unobserved characteristics are those factors on which data is not collected.

However, when these characteristics are considered as individual variables, only some of them have a statistically significant effect on teachers' perceptions of DL. In the sections below, I discuss the variables that were statistically significant and had associations with DL in the same direction (positive or negative) at all three school levels and then discuss the variables for which there were not consistent results across the three school levels.

### **Variables with Consistent Results Across School Levels**

In this section, I discuss the seven variables that were statistically significant across all three school levels and that the direction of the relationship was consistent across all three school levels. These variables included school size, school achievement, survey response rate, principal tenure, principal race/ethnicity, proportion of students of color, and proportion of economically disadvantaged students enrolled in the school.

#### ***School Size***

Across all three levels, school size was negatively related to teacher perceptions of DL. This indicates that teachers in larger schools tend to have lower perceptions of DL as compared to their peers in smaller schools. It might be possible that principals in larger schools do not provide enough support and supervision, do less to incentivize collaboration among teachers, and do not allow teachers to actively participate in decision making processes because of the sheer magnitude of leading a larger school. Thus, ironically, one hypothesis is that school leaders in

larger schools do not have the time to properly enact DL. Of course, one could certainly argue that enacting DL would provide them more time to focus on the multitude of duties for which they are responsible, but being placed under intense pressure to quickly improve a school likely works against a principal taking a long-term, collaborative approach to school improvement.

It could also be possible that principals in large schools do not clearly communicate to the staff their expectations and intentions to enact DL in the school because it is simply more difficult and time-consuming to communicate effectively with a larger group of people. This does not imply that the principal is not enacting DL in the school but rather indicates that the principal and the teachers do not perceive DL enactment in the same way. Research suggests that the lower perception of DL in schools with large enrollment rates could be related to either the principal's focus on administrative functions or to the principal-staff ratio (Spillane and Healey, 2010; Urick, 2016). There is a considerable amount of evidence supporting the link between school size and the degree to which leadership is distributed in schools (Spillane & Healey, 2010; Urick, 2016). Spillane and Healey (2010) stated that the leader to staff ratio is a function of school size, indicating that in larger schools there are less formally designated leaders than in small schools. Thus, the school leader has less time to work on incentivizing teachers' active participation and collaboration among staff because most of his/her time is consumed with working directly with students and addressing additional demands placed on classroom teachers. Urick (2016) found that school size helped to predict principals and teachers' typologies. Her findings suggest that leadership practice and teachers' perceptions of these leadership practices vary according to the school context. Finally, Louis and colleagues (2010) suggest that the reason why leadership practice and their effects are different in large schools is simply because the principal does not have time to work directly with all teachers (p. 43). The results of this

study inform the existent literature by showing the negative impact of school size on the perception of DL. That is, in large schools teachers perceive lower DL from their principal than teachers working in smaller schools.

### ***School Achievement***

In North Carolina, school academic success is assessed through a composite index that measures student test scores, student growth relative to test scores, and other student outcomes. The state published the data in three categories: the school did not meet expectations, the school met expectations, or the school exceeded expectations. Across all three school levels, I found that schools that met or exceeded expected growth is consistently associated with teacher perceptions of DL. Specifically, teachers hold higher perceptions when the school met the expected academic growth. There are several teacher-perceived behaviors that principals enact that have higher impact on student outcomes (Hallinger & Heck, 2009). In order to try to understand why teachers have higher perceptions of DL in schools that achieved the expected academic growth the previous year, I believe that these behaviors are strongly related to DL dimensions, leadership function, cohesive teamwork, and active participation in decision making. Therefore, the more the principal enacts DL behaviors, the more likely the school is to achieve expected academic growth, resulting in an increase of teachers' perceptions of DL in their schools. An alternative, but somewhat connected explanation is that teachers feel more confident and more satisfied with their principal when the school achieves better student academic outcomes (Goldring, Grissom, Rubin, Neumerski, Cannata, Drake & Schuermann, 2015). The literature relating teacher organizational commitment (Hulpia et al., 2009), job satisfaction (Bogler, 2001), and teacher attrition is vast (Urlick, 2016).

### ***Survey Response Rates***

I included survey response rates as a potential proxy for the unobserved characteristics of schools with the belief that schools with lower response rates are systematically different than schools with higher response rates. I found that high survey response rates are also positively associated with DL perceptions (Urlick, 2016). Teachers in schools that have higher survey response rates are more likely to report greater perceptions of how school leadership is distributed in their schools relative to teachers with lower survey response rates. This might be explained by teachers that are more involved and committed with the educational goal, and feel that their principals take into account their opinions to run the school, and find their leader more available and supportive are more likely to participate in surveys with great response rates. Similarly, the survey response rate may simply be a proxy for a host of unobserved characteristics at the school or of the teachers in schools with lower response rates that are somehow associated with lower odds of responding to the survey. For example, teachers in such schools may fear the reactions of a principal when the survey results are negative relative to other schools. Teachers in such schools may also not trust the claims of the survey administrator that the school administration would be unable to identify actual respondents. Regardless, the inclusion of this variable is important because it may serve as a proxy for the unobserved teacher and climate/culture characteristics associated with the school.

### ***Principal Tenure***

Another characteristic that is consistently associated with how teachers perceive DL in at all three school levels is principal tenure at the school and principals' race/ethnic group. Teachers who work with principals with greater than 10 years of tenure at the school perceive a greater degree of leadership distribution in their schools relative to their peers in schools with principals

possessing lower levels of tenure. One plausible explanation is that more experienced principals tend to be more effective in all facets of their job (Fuller, Hollingworth, & Pendola, in press), thus principals with greater tenure are simply more effective principals and the teacher perceptions simply reflect this. One would expect principals with more experience to improve DL practice by increasing the amount of information provided to the school, therefore improving decision making abilities. In the same way, principals' and teachers' tenure homogeneity is believed to promote communication and cohesive collaboration, while differences in tenure are associated with disagreements among school personnel (Spillane & Healey, 2010). The results of this study support these beliefs by showing that principals with less than 10 years of tenure at the school is associated with lower levels of teachers' perceptions of DL.

### ***Principal Race/Ethnicity***

With respect to a principal's race or ethnicity, the results show the race/ethnicity of the principal is associated with teacher perceptions of DL. In schools in which the principal is African American, teacher perceptions of DL are lower relative to their peers at schools led by a White principal. On the other hand, when the principal is neither African American nor White, teachers hold higher perceptions of DL. This finding is curious in that there seems to be no reasonable rationale as to why teachers in schools with African American principals would hold lower perceptions of DL than teachers with principals from another racial/ethnic background. One possible explanation is that African American principals lead schools that have unobserved characteristics that are substantially different than in other schools. For example, perhaps African American principals lead schools for which there is greater pressure to increase student outcomes in a shorter amount of time, thus the principals do not feel as if they can spend the necessary time and energy to effectively enact DL. Camburn, Rowan and Taylor (2003) found that African

American and other principal of color are more likely to perform instructional leadership; this indicates that their focus is mainly on coordinating curriculum and instruction rather than enacting distributed leadership. Thus, this is also a possible explanation.

Another potential explanation could be that African Americans remain severely underrepresented in leadership preparation programs and leadership positions. In the sample of this study, only 15 percent of all school principals were African American. In addition, African American principals are usually employed in large, urban schools that are underfunded, have fewer resources, a significant number of uncertified teachers, and low academic achievement (Brown, 2005). All of these factors may be associated with lower teacher perceptions of DL. Fielder (1996) suggested that African American administrators may have less power to successfully lead schools when the staff is largely White than when the staff is largely teachers of color. Nevertheless, the opposite could also be possible; the Black principals may have difficulties leading schools with a large number of students and teachers of color.

### ***Student Characteristics***

Finally, with respect to student characteristics, the findings of this study also support previous evidence about the relationship between the proportion of students of color and economically disadvantaged enrolled in the school and the perception of DL. The percentage of economically disadvantaged students enrolled is associated with lower levels of teacher perception of DL at all three levels of schooling. Students' socio-economic-status (SES) has been shown to have an effect in every aspect of the teaching learning experience, thus it is not surprising that I find a negative relationship in this study as well.

Heck and Hallinger (2009) as well as Spillane and Healey (2010) found that teachers working in elementary schools with greater proportions of students of color enrolled had lower

perceptions of DL. Similarly, the results of this study show that teachers working in schools with greater percentages of economically-disadvantaged and students of color enrolled tend to have lower perceptions of DL for all three school levels. The lower perceptions of DL in schools with relatively greater percentages of students of color and students living in poverty can be attributed to the findings that such schools tend to have lower overall working conditions (Hulpia et al., 2012; Ladd, 2011). At this point, it is important to question ourselves about what has been done to address these issues. Students of color and economically disadvantaged students keep suffering not only from not having the necessary resources to achieve better educational outcomes, but also from not having principals that enact DL in their schools.

Teachers may be biased about schools achieving the academic expected growth. Effective schools are universally perceived as the ones with higher student outcomes; therefore, schools that achieve academic growth are seen as better schools compared to the ones that did not grow as expected. Student body characteristics are probably the most influential factor in teachers' biases. In fact, there is a widespread assumption that low SES students and students of color are more likely to get involved in disciplinary problems (Krezmien, Leone & Achilles, 2006). However, what teachers might not know is that the disciplinary actions are often more severe for students of color. Another assumption is that low SES students of color are less likely to achieve outstanding student outcomes, without considering that the reasons might not have anything to do with the students but rather with the type of schooling that these students need (Smith & Levinson, 2011). Teachers need to address their bias in a more holistic way which allows them to understand that schools with higher proportions of low SES students of color might require harder work, but it is not because of the students' characteristics or the principal's characteristics, but rather the result of the educational systems.

### **Variables with inconsistent results across school levels**

In this section, I discuss the two variables that did not have consistent results across all three school levels. These variables include: principal and teacher gender.

#### ***Principal and teacher gender***

Teachers working with female principals in elementary- and high- schools perceive less enactment of DL in their schools than teachers in middle school. These differences could be related to the differences between schools in terms of the number of female principals in elementary school relative to middle and high school. Male principals were more likely be associated with greater perceptions of DL in elementary and high schools. In the sample used in this study, only 30 percent of elementary school principals were male, compared to 70 percent in high school. It is important to mention this, because besides school size, all other school characteristics are similar in the sample used for this analysis. The literature about how principals' diversity affects teachers is inconclusive. Diversity in areas such as gender, race, and tenure at the school is believed to hinder teachers' perceptions of DL (Spillane & Healey, 2010). Gender diversity is considered an important factor in educational research due to current increment of female principals and the large number of female teachers. This study found that principal gender does not influence teachers' perceptions of DL at the middle school level. This raises an important consideration for the study of DL in elementary and high schools, Are principals in these school levels still experiencing the "glass escalator" effect (see Williams, 2000) or still suffering of the role expectation phenomenon (Bensimon & Marshall, 1997), where women teach and men lead? Further research needs to be done examining teachers' perceptions of female elementary and high school principals' DL.

These findings are particularly important for two reasons. First, DL refers to the interaction among principals, teachers, and the contextual situation in which all actors share responsibilities and work together as a whole to achieve educational goals. Thus, in addition to principals assessing their own leadership through their own perceptions and teachers' perceptions of the school leadership distribution, school principals should analyze how the school context is affecting these perceptions. This means that in addition to evaluating the perceptions about DL, principals should determine which DL behaviors need reinforcement and which ones are succeeding. School leaders should motivate and convince teachers that the only way to improve their working conditions and address concerns and issues is by working together and finding sources of action to create better school environment, school climate, and student academic and nonacademic outcomes. Only through improving relationships with teachers and teacher outcomes will schools improve.

Second, principals who monitor a three-way relationship with teachers and their schools' characteristics may have a greater influence on teacher outcomes and teacher retention. A principal or leader who makes decisions based on the interaction between themselves, the teachers or followers and context may have better results as a leader (Spillane, 2006). A principal that is aware of these interactions may influence teachers to feel that their needs are met and that they are a part of a professional community that shares values and expectations. Teachers who feel having a good relationship with their principal and other teachers develop a stronger sense of commitment thus, they are more likely to stay (Hulpia et al., 2010). This combination between principal, teachers and context could promote teachers to increase their perceptions of DL.

### **Distributed leadership and teacher turnover**

School principals need staff stability in order to build a synergy with teachers that allows achieving better student and organizational outcomes (Devos et al., 2014; Robinson, 2008; Urick, 2016). This study shows that at every level of schooling, teachers who have higher perceptions of DL are less likely to state their intent to leave the school, even after controlling for myriad other factors that affect a teacher's intention to remain at a school. In other words, the greater the extent to which teachers perceive that their principal has enacted DL, the lower the probability of the teachers wanting to leave their school the next year.

These findings are consistent with previous research that identifies a principal's leadership style as an important factor affecting teacher turnover (e.g. Currihan, 2000; Heck & Hallinger, 2009, Ladd, 2011; Urick, 2016). Several studies have examined the impact of DL on other organizational outcomes such as teacher organizational commitment and loyalty (Hulpia et al., 2010, 2011). However, little was known about the ways in which teacher perceptions of DL influenced teacher intentions of leaving their schools. We know that organizational commitment and loyalty are negatively related to teacher turnover (Hulpia et al., 2009, Hulpia et al., 2010; Muijs & Harris, 2003; Neuman & Simmons, 2000). One could infer, then, that teachers who perceive their principal enacts DL are more satisfied, thus have stronger organizational commitment and are, therefore, less likely to want to leave their jobs. Additionally, while not focusing on DL in particular, Ladd (2011) found that some specific components of DL are negatively related to teacher turnover. Similarly, Urick (2016) found that teachers who feel empowered through actively participating in decision making processes are less likely to leave their jobs. In short, one could assume that teachers working with supportive principals who incentivize teachers' active participation in decision making processes and teacher collaboration

are more committed to their jobs. Therefore, we can infer that teachers who feel high levels of DL, which entails higher involvement and participation in decision making, collaboration among peers and professional development, principal support and an overall positive environment, are more likely to stay at their current school. Therefore, teacher retention is an outcome that demonstrates the importance of their perceptions and roles in leadership since whether or not a teacher intends to stay or leave depends directly on the way they perceive the school leadership environment. Teachers' perception of school leadership is known as a factor associated with teachers' decision to leave their jobs (Hulpia et al., 2010; Urick, 2016). The results of this study show that at every school level, the higher the teachers' preconceptions of DL dimensions, (leadership function, participative decision making, and teamwork) the lower the probability of teachers leaving their current schools.

It is important to mention that these findings hold after controlling for the influence of a variety of other factors associated in the literature with teacher turnover. How teachers perceive DL in their schools was the only characteristic that was consistently related to teacher turnover at all three levels of schooling. There were other characteristics that were associated with teacher turnover in the results of this study that were specific to individual levels of schooling. For example, teachers with less than 10 years of tenure in elementary- and high- schools are less likely to express their intentions to leave their schools after controlling for a number of other factors. The failure of the variable to achieve statistical significance at the middle school level may be a function of a smaller sample size at the middle school level than the lack of a relationship. Interestingly, teachers working in schools with female principals expressed greater intentions to stay in their schools. This is consistent with research that finds females as more effective leaders (Gates, Ringel, Santibanez, Guarino, Ghosh-Dastidar & Brown, 2006; Price,

2012; Smith & Levinson, 2011; Spillane & Healey, 2010) The same result holds for elementary school principals; teachers are more likely to state their intentions to stay if the principals had less than 10 years of tenure. Additionally, high school female teachers are more likely to leave their schools than their male peers. With respect to principal race/ethnicity, only teachers in high schools with principals from the “Other” race category are more likely to express their intentions to leave their schools when compared to teachers in schools with White principals. Finally, with respect to student characteristics, elementary- and middle- school teachers are more likely to express their intentions to leave their schools when the proportion of students of color increases. In other words, as the percentage of students of color increases in elementary- and middle- schools, the more likely the teachers are to state their intentions to leave their schools—even after controlling for a host of other factors associated with intentions to leave a school. This is consistent with other research (Ingersoll, 2001; Loeb, 2001; Smith & Ingersoll, 2004; Smith & Persson, 2016; Sun & Ni, 2015; Wang & Eccles, 2014). Finally, with respect to the proportion of economically disadvantaged students enrolled in the schools; only high school teachers are more likely to state their intentions to leave their schools as the percentage of economically disadvantaged students in the school increases.

While the current study provides valuable insight into the relationship between teacher perceptions of DL and teachers’ stated intentions of leaving their school, there remains a need for much further research into this area. Indeed, in order to gain a better understanding of the effect of other school characteristics that might interact with teachers' intentions, principals, policy makers, and practitioners need to examine to the policies, strategies, and other factors that facilitate or impede teacher turnover from schools. I argue, in fact, that it is critical for the students, the schools, and school districts to reduce teacher turnover rates. It is important to

recognize that teacher turnover has a negative impact on students and on the school as an organization. School principals, policy makers, and practitioners need to acknowledge that teacher turnover often affects students in most need of better chances. Therefore, district and school level policies need to find ways to incentive teachers to stay in their schools.

Policy makers, educational researchers, and practitioners should emphasize the benefits of adopting a leadership approach that seeks to distribute leadership throughout the school. There are several benefits of sharing knowledge, collectively addressing problems, and sharing expertise in schools. However, teachers and principals need to be provided with alternatives to address issues related with the enactment of DL in their schools. Principals and teachers need to share and concentrate efforts on enacting effective DL. School staff that mutually develops capacity and capability will be more likely to change leadership models and achieve leadership quality.

### **Recommendations for future research**

In this study, teacher and principal perceptions of DL were found to be positively correlated, albeit weakly. In line with prior research (Urlick, 2016), these findings suggest principal and teacher perceptions are different measures that help provide insight about the interactions among DL actors within schools. Studies of leadership style or school effectiveness often aggregate perceptions at the school level; thus, further research should pay closer attention to individual perceptions of how leadership is distributed in schools. This could help us better understand why teacher and principals in the same school have different perceptions of leadership distribution. Moreover, we need longitudinal investigations that examine how changes in the behavior of principals might influence teacher perceptions of DL.

Schools need staff stability in order to achieve a synergism that contributes to school improvement, empowerment, and commitment (Urlick, 2016). Examining what factors influence the congruency and difference between principal and teacher perceptions is important to better understand the ways in which both work together and how principals might increase teacher retention. A deeper study of individual perceptions might also help increasing our knowledge of the ways in which teachers and principal interact in a variety of scenarios and how these situations define their agreements and/or disagreements about DL in their schools.

Additionally, it is also important to analyze interactions across groups of teachers and principals. The results of this study show that school size, percentage of students of color, percentage of students living in poverty, principal tenure, principal gender, and principal race/ethnicity are associated with teachers' perceptions of DL. While this study extends the findings about the effect that principal characteristics have on perceptions of DL, future research should study why these characteristics are associated with the perceptions of both teachers and principals. This could improve professional development practices and teacher retention. Including DL in principal and teacher preparation programs may also increase teacher perceptions of their school leaders and reduce teacher turnover, benefiting everybody involved in the educational process. In addition, understanding teachers' perceptions assists administrative decisions and policies that lead to change within the current school leadership structure. Principals need to realize that applying DL goes beyond simply implementing professional development programs and putting teachers in communities.

This study analyzed the difference between teachers' and principals' perceptions of DL; further research should analyze not only DL as a whole but its dimensions to identify specific areas in which incongruity is higher. The study of these differences in leadership based on

context is actually emerging (Goldring et al., 2015; Urick, 2016). The findings presented here extend the areas of investigation by presenting additional characteristics that affect teachers' perceptions of DL. Examining if these characteristics have the same effect on principals' perceptions of their own DL should be the next step.

Literature suggests that different levels of experience are associated with the ability to make decisions within groups and that homogeneity in tenure improves communication and collaboration among group members (Spillane & Healey, 2010). Nevertheless, it is also been argued that due to individuals tendency to work with their similar others, diversity has been associated with an increase of conflict within groups. Future research should examine if principal and teachers' homogeneity or diversity in terms of experience, tenure, gender, ethnicity, and age affect DL perceptions and their intent to leave or stay in their jobs.

It is important to mention that, in line with previous research, this study found that schools serving higher concentrations of students of color and students living in poverty are not only more likely to suffer from staff instability but also teachers working in these institutions seem to have lower perceptions of DL. High rates of teacher and principal turnover compromise educational outcomes and perpetuate inequities. More attention should be paid to determining why teachers and principals have these perceptions; and even more importantly, if the differences are truly due to school leadership, or if there are other factors that interfere when assessing DL in these types of schools.

Additionally, there is a need to examine principal placement practices. Further research on this area is crucial to better understand *how* DL is viewed and applied in certain schools. As shown in this study, school characteristics have a negative effect on how teachers perceive

leadership distribution in their schools. These results suggest that teachers may interpret these conditions as not optimal for their work, and decide to leave their jobs.

Finally, this study provides evidence of TWCS's concurrent criterion-related validity to assess teachers' perceptions of DL. North Carolina uses the TWCS to analyze and improve teaching-learning conditions and reduce teacher attrition. The survey was developed to assess if teachers perceived their work place to have a positive, collaborative school climate and support from colleagues and administrators; excessive workload; lack of time and frustration with reform efforts as areas in need of focus and improvement, and participative decision making levels to improve student learning (Hirsch & Emerick, 2007). Since its creation, the TWCS has provided educators, stakeholders, policymakers, and the community with a critical understanding of the status of working conditions in schools across North Carolina. This study provides concurrent criterion-related validity evidence of the scores of the 20 TWCS items used in this analysis to assess teachers' perceptions of DL.

A common way to assess the utility of scores is to use them to predict other variables of interest (Kline, 2005). In this case, teachers' perceptions of DL scores were used to predict the probability of teacher turnover. The results of the binary logistic regression used to predict the probability of teacher turnover reveal that at all levels of schooling, teachers' perceptions of DL account for unique and significant variance above and beyond the other nine covariates included in the analysis. The importance of these findings is given by their potential use in predictive studies. Further research could use the scores of the 20 items identified in this study as representative of teachers' perceptions of DL to predict the probability of teachers leaving their job during the consecutive year (Kline, 2005). Additionally, evidence suggests that there is no need to use complex weighting schemes for the predictors in the model, since it does not offer

much improvement over not doing it (Kline, 2005). Thus, this study provides an instrument that reliably assesses teachers' perceptions of three DL dimensions: leadership function, participative decision making, and collaboration among school staff, according to the existent literature (Heck & Hallinger, 2010; Hulpia et al, 2012; Spillane & Healey, 2010).

## REFERENCES

- Angelle, Pamela S. "An organizational perspective of distributed leadership: A portrait of a middle school." *Rmle Online* 33.5 (2010): 1-16. Retrieved from: <http://www.tandfonline.com/doi/pdf/10.1080/19404476.2010.11462068>
- Auwarter, A. E., & Aruguete, M. S. (2008). Effects of student gender and socioeconomic status on teachers' perceptions. *The Journal of Educational Research*, 101(4), 243-246.  
Retrieved from: <http://www.jstor.org/stable/27548242>
- Bass, B. M. (1985). *Leadership and performance beyond expectations*. Free Press; Collier Macmillan.
- Badaracco, J.L. (2001). We don't need another hero. *Harvard Business Review*, 79, 120–126.
- Bamburg, J. D., & Andrews, R. L. (1990). *Instructional Leadership, School Goals, and Student Achievement: Exploring the Relationship between Means and Ends*. Retrieved from ERIC database. (ED319783)
- Bandura, A., & Locke, E. A. (2003). Negative self-efficacy and goal effects revisited. *Journal of applied psychology*, 88. doi:10.1037/0021-9010.88.1.87
- Barnett, K., & McCormick, J. (2003). Vision, relationships and teacher motivation: A case study. *Journal of Educational Administration*, 41, 55-73. doi:<http://dx.doi.org/10.1108/09578230310457439>
- Bennett, N., Wise, C., Woods, P., and Harvey, J. (2003). Distributed Leadership: A Review of Literature. *National College for School Leadership*. Retrieved from: <http://oro.open.ac.uk/8534/1/bennett-distributed-leadership-full.pdf>

- Bensimon, E. M., & Marshall, C. (1997). Policy analysis for postsecondary education: Feminist and critical perspectives. *Feminist critical policy analysis II: A perspective from post-secondary education*, 1-21.
- Bogler, R. (2001). The influence of leadership style on teacher job satisfaction. *Educational administration quarterly*, 37, 662-683. doi:10.1177/00131610121969460
- Bogler, R., & Somech, A. (2004). Influence of teacher empowerment on teachers' organizational commitment, professional commitment and organizational citizenship behavior in schools. *Teaching and teacher education*, 20, 277-289. doi:10.1016/j.tate.2004.02.003
- Bossert, S., Dwyer, B. R., and Lee, G. (1982). "The instructional management role of the principal." *Educational Administration Quarterly*, 18, 69-80.
- Branch, G. F., Hanushek, E. A., & Rivkin, S. G. (2012). *Estimating the effect of leaders on public sector productivity: The case of school principals* (No. w17803). National Bureau of Economic Research. Retrieved from: <http://files.eric.ed.gov/fulltext/ED529175.pdf>
- Briggs, K. L., & Wohlstetter, P. (2003). Key elements of a successful school-based management strategy. *School effectiveness and school improvement*, 14, 351-372. doi:10.1076/sesi.14.3.351.15840
- Bryk, A. & Raudenbush, S. (1992). Hierarchical linear models: Applications and data analysis methods. Newbury Park: Sage Publications
- Brookover, W. B., & Lezotte, L. W. (1979). Changes in school characteristics coincident with changes in student achievement. Occasional Paper No. 17. Retrieved from: ERIC database. (ED181005)
- Burns, J. M. (1978). Leadership New York. NY: Harper and Row Publishers.

- Camburn, E. M., & Han, S. W. (2011). Two decades of generalizable evidence on US instruction from national surveys. *Teachers College Record*, 113, 561-610. Retrieved from: [https://www.researchgate.net/profile/Eric\\_Camburn/publication/270284354\\_Two\\_Decades\\_of\\_Generalizable\\_Evidence\\_on\\_U.S.\\_Instruction\\_from\\_National\\_Surveys/links/54bcea4c0cf24e50e940b79b.pdf](https://www.researchgate.net/profile/Eric_Camburn/publication/270284354_Two_Decades_of_Generalizable_Evidence_on_U.S._Instruction_from_National_Surveys/links/54bcea4c0cf24e50e940b79b.pdf)
- Camburn, E., Rowan, B., & Taylor, J. E. (2003). Distributed leadership in schools: The case of elementary schools adopting comprehensive school reform models. *Educational evaluation and policy analysis*, 25, 347-373. doi: 10.3102/01623737025004347
- Chrispeels, J. H. (Ed.). (2004). *Learning to lead together: The promise and challenge of sharing leadership*. Sage Publications.
- Coelli, M., & Green, D. A. (2012). Leadership effects: School principals and student outcomes. *Economics of Education Review*, 31(1), 92-109. Retrieved from: [http://economics.ubc.ca/files/2013/05/pdf\\_paper\\_david-green-leadership-effects-school-principals.pdf](http://economics.ubc.ca/files/2013/05/pdf_paper_david-green-leadership-effects-school-principals.pdf)
- Cohen, B. H. (2008). *Explaining psychological statistics*. John Wiley & Sons.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (Ed.). (2013). *Applied multiple regression/correlation analysis for the behavioral sciences*. Routledge.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *psychometrika*, 16(3), 297-334.
- Currihan, D. B. (2000). The causal order of job satisfaction and organizational commitment in models of employee turnover. *Human resource management review*, 9, 495-524. doi:10.1016/S1053-4822(99)00031-5

- Darling-Hammond, L. (2003). Keeping Good Teachers: Why It Matters, What Leaders Can Do. *Educational leadership*, 60, 6-13. Retrieved from ERIC database. (EJ666108)
- Davis, S., Kearney, K., Sanders, N., Thomas, C., & Leon, R. (2011). The policies and practices of principal evaluation: A review of the literature. *San Francisco, CA: WestEd*.
- De Dreu, C. K., & West, M. A. (2001). Minority dissent and team innovation: the importance of participation in decision making. *Journal of applied Psychology*, 86,1191. doi: <http://dx.doi.org/10.1037/0021-9010.86.6.1191>
- Dee, J. R., Henkin, A. B., & Singleton, C. A. (2006). Organizational commitment of teachers in urban schools examining the effects of team structures. *Urban Education*, 41, 603-627. doi:10.1177/0042085906292512
- Devos, G., Tuytens, M., & Hulpia, H. (2014). Teachers' organizational commitment: Examining the mediating effects of distributed leadership. *American Journal of Education*, 120(2), 205-231. doi: 10.1086/674370
- Dhuey, E., & Smith, J. (2014). How important are school principals in the production of student achievement?. *Canadian Journal of Economics/Revue canadienne d'économie*, 47(2), 634-663. Retrieved from: [http://www.aefpweb.org/sites/default/files/webform/dhuey\\_smith\\_princ\\_nov22.pdf](http://www.aefpweb.org/sites/default/files/webform/dhuey_smith_princ_nov22.pdf)
- Duignan, P., & Bezzina, M. (2006, October). Distributed leadership: The theory and the practice. In *CCEAM Annual Conference, Hilton Cyprus Hotel, Lefkosia, Cyprus* (pp. 12-17). Retrieved from:<http://www.topkinisis.com/conference/CCEAM/wib/index/outline/PDF/DUIGNAN%20Patrick.pdf>
- Duignan, P. (2007). *Educational leadership: Key challenges and ethical tensions*. Cambridge University Press.

- Eckman, E. W. (2004). Similarities and differences in role conflict, role commitment, and job satisfaction for female and male high school principals. *Educational administration quarterly*, 40(3), 366-387.
- Edmonds, R. R. (1981). Making public schools effective. *Social Policy*, 12, 56-60. Retrieved from ERIC database. (EJ254572)
- Elmore, R. F. (2000). Building a new structure for school leadership. *Albert Shanker Institute*.
- Farr, S. (2010). *Teaching as leadership: The highly effective teacher's guide to closing the achievement gap* (1st ed.). San Francisco: Jossey-Bass.
- Firestone, W. A., & Pennell, J. R. (1993). Teacher commitment, working conditions, and differential incentive policies. *Review of educational research*, 63, 489-525. doi:10.3102/00346 543063004489
- Fisman, R. J., Khurana, R., Rhodes-Kropf, M., & Yim, S. (2013). Governance and CEO turnover: Do something or do the right thing?. *Management Science*, 60, 319-337. doi: [http://dx. doi.org/10.1287/mnsc.2013.1759](http://dx.doi.org/10.1287/mnsc.2013.1759)
- Fuller, E., & Hollingworth, L. (2014). A bridge too far? Challenges in evaluating principal effectiveness. *Educational Administration Quarterly*, 50(3), 466-499. doi: 10.1177/0013161X13506595
- Fuller, E., Hollingworth, L. & Pendola, A. (in press). The every Student Succeeds Act, State efforts to improve access to effective educators, and the importance of school leadership. *Educational Administration Quarterly*. Doi: 10.1177/0013161X17711481
- García-Retamero, R., & López-Zafra, E. (2006). Congruencia de rol de género y liderazgo: el papel de las atribuciones causales sobre el éxito y el fracaso. *Revista Latinoamericana de*

- Psicología*, 38, 245-257. Retrieved from: <http://www.scielo.org.co/pdf/rlps/v38n2/v38n2a02>
- Gates, S. M., Ringel, J. S., Santibanez, L., Guarino, C., Ghosh-Dastidar, B., & Brown, A. (2006). Mobility and turnover among school principals. *Economics of Education Review*, 25(3), 289-302.
- Glass, G. V., & Hopkins, K. D. (1996). Statistical methods in psychology and education. *Allyn & Bacon, Needham Heights, MA*.
- Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2001). *Supervision and instructional leadership: A developmental approach*. Allyn & Bacon/Longman Publishing, a Pearson Education Company, 1760 Gould Street, Needham Heights, MA 02494. Web site: <http://www.abacon.com>. Retrieved from ERIC database. (ED482619)
- Goldstein, J. (2003). Making sense of distributed leadership: The case of peer assistance and review. *Educational Evaluation and Policy Analysis*, 25, 397-421. doi:10.3102/01623737025004397
- Gordon, R. (2010). Dispersed leadership: exploring the impact of antecedent forms of power using a communicative framework. *Management Communication Quarterly*, 24, 260-287
- Greenleaf, R. K., Frick, D. M., & Spears, L. C. (1996). *On becoming a servant-leader* (No. D10297).
- Griffith, J. (2004). Relation of principal transformational leadership to school staff job satisfaction, staff turnover, and school performance. *Journal of Educational Administration*, 42, 333-356. Retrieved from: <http://dx.doi.org/10.1108/09578230410534667>

- Grissmer, D., & Kirby, S. N. (1997). Teacher Turnover and Teacher Quality. *Teachers College Record*, 99, 45-56. Retrieved from ERIC database. (EJ557686)
- Gronn, P. (2000). Distributed properties: A new architecture for leadership. *Educational Management Administration Leadership* 28, 317–338. doi:10.1177/0263211X000283006
- Gronn, P. (2002). Distributed leadership as a unit of analysis. *Leadership Quarterly*, 13, 423–451. doi: 10.1016/S1048-9843(02)00120-0
- Hallinger, P. (1992). The evolving role of American principals: From managerial to instructional to transformational leaders. *Journal of Educational Administration*, 30. Retrieved from <http://dx.doi.org/10.1108/09578239210014306>.
- Hallinger, P. (2003). Leading educational change: Reflections on the practice of instructional and transformational leadership. *Cambridge Journal of education*, 33, 329-352. doi:10.1080/0305764032000122005
- Hallinger, P. (2005). Instructional leadership and the school principal: A passing fancy that refuses to fade away. *Leadership and policy in schools*, 4, 221-239. doi:10.1080/15700760500244793
- Hallinger, P. (2010). A review of three decades of doctoral studies using the Principal Instructional Management Rating Scale: A lens on methodological progress in educational leadership. *Educational Administration Quarterly*. doi: 10.1177/0013161X10383412
- Hallinger, P., Bickman, L., & Davis, K. (1996). School context, principal leadership, and student reading achievement. *The Elementary School Journal*, 96, 527-549. doi:10.1086/461843

- Hallinger, P., & Heck, R. H. (1996a). Reassessing the principal's role in school effectiveness: A review of empirical research, 1980-1995. *Educational administration quarterly*, 32, 5-44. doi:10.1177/0013161X96032001002
- Hallinger, P., & Heck, R. H. (1996b). The principal's role in school effectiveness: An assessment of methodological progress, 1980–1995. *International handbook of educational leadership and administration*, 723-783. Springer Netherlands. doi:10.1177/0013161X96032001002
- Hallinger, P., & Murphy, J. (1985). Assessing the instructional management behavior of principals. *The Elementary School Journal*, 86, 217-247. Retrieved from <http://www.jstor.org/stable/1001205>
- Hammersley-Fletcher, L., & Brundrett, M. (2005). Leaders on leadership: the impressions of primary school head teachers and subject leaders. *School leadership & management*, 25, 59-75. doi:10.1080/1363243052000317064
- Harris, A. (2005). Teacher leadership: More than just a feel-good factor? *Leadership and policy in schools*, 4, 201-219. doi:10.1080/15700760500244777
- Harris, A., & Muijs, D. (2005). Improving schools through teacher leadership. Berkshire: Open University Press.
- Harris, A. (2013). Distributed Leadership Friend or Foe?. *Educational Management Administration & Leadership*, 41, 545-554.
- Heck, R. H., & Hallinger, P. (2009). Assessing the contribution of distributed leadership to school improvement and growth in math achievement. *American Educational Research Journal*, 46, 659-689. doi: 10.3102/0002831209340042

- Heck, R. H., & Hallinger, P. (2010). Testing a longitudinal model of distributed leadership effects on school improvement. *The leadership quarterly*, 21, 867-885. doi:10.1016/j.leaqua.2010.07.013
- Heck, R. H., Larsen, T. J., & Marcoulides, G. A. (1990). Instructional leadership and school achievement: Validation of a causal model. *Educational Administration Quarterly*, 26, 94-125. doi:10.1177/0013161X90026002002
- Heinicke, C. M. and R. F. Bales (1953). "Developmental trends in the structure of small groups." *Sociometry* 16, 7-38.
- Heller, M. F., & Firestone, W. A. (1995). Who's in charge here? Sources of leadership for change in eight schools. *The Elementary School Journal*, 65-86. doi:  
<http://www.jstor.org/stable/1001666>
- Hirsch, E., & Emerick, S. (2007). Teacher Working Conditions Are Student Learning Conditions: A Report on the 2006 North Carolina Teacher Working Conditions Survey. *Center for Teaching Quality*. Retrieved from: <http://files.eric.ed.gov/fulltext/ED498770.pdf>
- Holtz, R. (2004). Group cohesion, attitude projection, and opinion certainty: Beyond interaction. *Group Dynamics: Theory, Research, and Practice*, 8, 112. doi:<http://dx.doi.org/10.1037/1089-2699.8.2.112>
- Hom, P. W., & Griffeth, R. W. (1995). Employee turnover. Cincinnati, OH: South-Western.
- Hosmer, D., Lemeshow, S., & NetLibrary, I. (2000). *Applied logistic regression* (2nd ed.). New York: Wiley.

- Hughes, G. 2012. Teacher Retention: Teacher Characteristics, School Characteristics, Organizational Characteristics, and Teacher Efficacy. *The Journal of Educational Research*, 105. doi:10.1080/00220671.2011.584922
- Hulpia, H., Devos, G., & Rosseel, Y. (2009). The relationship between the perception of distributed leadership in secondary schools and teachers' and teacher leaders' job satisfaction and organizational commitment. *School Effectiveness and School Improvement*, 20, 291-317. doi:10.1080/09243450902909840.
- Hulpia, H., Devos, G., Rosseel, Y., & Vlerick, P. (2012). Dimensions of distributed leadership and the impact on teachers' organizational commitment: a study in secondary education. *Journal of applied social psychology*, 42(7), 1745-1784.
- Hulpia, H., & Devos, G. (2010). How distributed leadership can make a difference in teachers' organizational commitment? A qualitative study. *Teaching and teacher education*, 26, 565-575. doi:10.1016/j.tate.2009.08.006
- Hulpia, H., Devos, G., & Van Keer, H. (2011). The relation between school leadership from a distributed perspective and teachers' organizational commitment examining the source of the leadership function. *Educational Administration Quarterly*, 47, 728-771. doi:10.1177/0013161 X11402065
- Imper, M., Neidt, W.A. and Reyes, P. (1990), "Factors contributing to teacher satisfaction with participative decision making." *Journal of Research and Development in Education*, 23(4), 216-225.
- Ingersoll, R. (2001). Teacher Turnover and Teacher Shortages: An Organizational Analysis. *American Educational Research Journal*, 38(3), 499-534. Retrieved from <http://www.jstor.org.ezaccess.libraries.psu.edu/stable/3202489>

- Ingersoll, R. (2012). Beginning teacher induction: What the data tell us. Retrieved from [http://repository.upenn.edu/gse\\_pubs/234](http://repository.upenn.edu/gse_pubs/234)
- Ingersoll, R. M., & Smith, T. M. (2003). The wrong solution to the teacher shortage. *Educational leadership*, 60, 30-33. Retrieved from: <http://citeseerx.ist.psu.edu/viewdoc/download?doi:10.1.1.182.106&rep=rep1&type=pdf>.
- Iverson, R. D. (1996). Employee acceptance of organizational change: the role of organizational commitment. *International Journal of Human Resource Management*, 7, 122-149. doi: 10.1080/ 09585199600000121
- Iverson, R. D., & Roy, P. (1994). A causal model of behavioral commitment: Evidence from a study of Australian blue-collar employees. *Journal of management*, 20, 15-41. doi: 10.1177/0149 20639402000102
- Jacques, C., Clifford, M., & Hornung, K. (2012). State policies on principal evaluation: Trends in a changing landscape. *Washington, DC: National Comprehensive Center for Teacher Quality*.
- Jacob, B. (2007). The challenges of staffing urban schools with effective teachers. *The Future of*
- Krezmien, M. P., Leone, P. E., & Achilles, G. M. (2006). Suspension, race, and disability: Analysis of statewide practices and reporting. *Journal of Emotional and Behavioral Disorders*, 14(4), 217-226. Retrieved from: <http://ezaccess.libraries.psu.edu/login?url=http://search.proquest.com.ezaccess.libraries.psu.edu/docview/214913481?accountid=13158>
- Kline, T. J. (2005). *Psychological testing: A practical approach to design and evaluation*. Sage Publications.

- Ladd, H. F. (2011). Teachers' perceptions of their working conditions: How predictive of planned and actual teacher movement? *Educational Evaluation and Policy Analysis*, 33(2), 235-261. doi:10.3102/0162373711398128
- Ladson-Billings, G. (2006). From the achievement gap to the education debt: Understanding achievement in US schools. *Educational researcher*, 35, 3-12. doi:10.3102/0013189X035007003
- Lance, C. E. (1991). Evaluation of a structural model relating job satisfaction, organizational commitment, and precursors to voluntary turnover. *Multivariate Behavioral Research*, 26, 137-162. doi: [http://dx.doi.org/10.1207/s15327906mbr2601\\_7](http://dx.doi.org/10.1207/s15327906mbr2601_7)
- Lashway, L. (1997a). The limits of shared decision making. *Teacher Librarian*, 25(1), 43.
- Lashway, L. (1997b). Shared Decision Making. *Research Roundup*, 13, n3. Retrieved from ERIC database. (ED406744)
- Lee, T. W., & Mitchell, T. R. (1994). An alternative approach: The unfolding model of voluntary employee turnover. *Academy of Management Review*, 19, 51-89. doi:10.5465/AMR.1994.9410122008
- Leithwood, K. (1994). Leadership for school restructuring. *Educational administration quarterly*, 30, 498-518. doi:10.1177/0013161X94030004006
- Leithwood, K. (2012). Core Practices. IN LEITHWOOD, K. & SEASHORE-LOUIS, K.(Eds.) *Linking Leadership to Student Learning*.
- Leithwood, K. A., Begley, P. T., & Bradley Cousins, J. (1990). The nature, causes and consequences of principals' practices: an agenda for future research. *Journal of educational administration*, 28. doi: <http://dx.doi.org/10.1108/09578239010001014>

- Leithwood, K., & Jantzi, D. (2000). The effects of transformational leadership on organizational conditions and student engagement with school. *Journal of Educational Administration*, 38, 112-129. doi: <http://dx.doi.org/10.1108/09578230010320064>
- Leithwood, K., & Jantzi, D. (2005). A review of transformational school leadership research 1996–2005. *Leadership and policy in schools*, 4, 177-199. doi: 10.1080/15700760500244769.
- Leithwood, K., Jantzi, D., & Steinbach, R. (1999). *Changing leadership for changing times*. McGraw-Hill Education (UK).
- Leithwood, K., Mascal, B., Strauss, T., Sacks, R., Memon, N., & Yashkina, A. (2007). Distributing leadership to make schools smarter: Taking the ego out of the system. *Leadership and Policy in Schools*, 6, 37-67. doi:10.1080/15700760601091267
- Leithwood, K., Patten, S., & Jantzi, D. (2010). Testing a conception of how school leadership influences student learning. *Educational Administration Quarterly*, 46, 671-706. doi: 10.1177/0013161X10377347.
- Leithwood, K. A., & Riehl, C. (2003). *What we know about successful school leadership*. Nottingham: National College for School Leadership.
- Leithwood, K.; Seashore, K., Anderson, S, Wahlstrom, K., Center for Applied Research and Educational Improvement. (2004). *Executive Summary: Review of Research: How Leadership Influences Student Learning*. University of Minnesota, Center for Applied Research and Educational Improvement. Retrieved from: <https://conservancy.umn.edu/bitstream/handle/11299/2102/CAREI%20ExecutiveSummary%20How%20Leadership%20Influences.pdf?sequence=1&isAllowed=y>

- Lezotte, L. (2001). Revolutionary and evolutionary: The effective schools movement. *Okemos, MI: Effective Schools Products, Ltd.* Retrieved from <http://www.edutopia.org/pdfs/edutopia.org-closing-achievement-gap-lezotte-article.pdf>
- Lincoln, J. R., & Kalleberg, A. L. (1996). Commitment, quits, and work organization in Japanese and US plants. *Industrial & Labor Relations Review*, 50, 39-59. doi:10.1177/001979399605000103
- Little, J. W. (1990). The persistence of privacy: Autonomy and initiative in teachers' professional relations. *Teachers college record*, 91, 509-536. Retrieved from [https://www.researchgate.net/profile/Judith\\_Warren\\_Little/publication/247944039\\_The\\_persistence\\_of\\_privacy\\_Autonomy\\_and\\_initiative\\_in\\_teachers'\\_professional\\_lives/links/569c191b08aea147695471c4.pdf](https://www.researchgate.net/profile/Judith_Warren_Little/publication/247944039_The_persistence_of_privacy_Autonomy_and_initiative_in_teachers'_professional_lives/links/569c191b08aea147695471c4.pdf)
- Loeb, S., Darling-Hammond, L., & Luczak, J. (2005). How teaching conditions predict teacher turnover in California schools. *Peabody Journal of Education*, 80, 44-70. doi:10.1207/s15327930pje8003\_4
- Louis, K. S., Marks, H. M., & Kruse, S. (1996). Teachers' professional community in restructuring schools. *American Educational Research Journal*, 33, 757-798. doi:10.3102/00028312033004757
- Lortie, D. C., & Clement, D. (1975). *Schoolteacher: A sociological study*, 12-29. Chicago: University of Chicago Press.
- MacBeath, J. (2005). Leadership as distributed: A matter of practice. *School leadership and management*, 25, 349-366. doi:10.1080/13634230500197165

- Marks, H. M., & Printy, S. M. (2003). Principal leadership and school performance: An integration of transformational and instructional leadership. *Educational administration quarterly*, 39, 370-397. doi:10.1177/0013161X03253412.
- Mascal, B., Leithwood, K., Straus, T., & Sacks, R. (2008). The relationship between distributed leadership and teachers' academic optimism. *Journal of Educational Administration*, 46(2), 214-228.
- Mathieu, J. & Zajac, D. 1990. A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological Bulletin*, 108, 171–194. doi: [http:// dx.doi.org/10.1037/0033-2909.108.2.171](http://dx.doi.org/10.1037/0033-2909.108.2.171)
- Mayrowetz, D., Murphy, J., Seashore L., K., & Smylie, M. A. (2007). Distributed leadership as work redesign: Retrofitting the job characteristics model. *Leadership and Policy in Schools*, 6, 69-101. doi:10.1080/15700760601091275
- McCreight, C. (2000). Teacher attrition, shortage, and strategies for teacher retention. Retrieved from ERIC database. (ED444986).
- Mcgarvey, B., Marriott, S., Morgan, V., & Abbott, L. (1997). The role of the core subject coordinator in supporting differentiation in Northern Ireland primary schools. *School Leadership & Management*, 17, 375-386. doi: 10.1080/13632439769926
- Mehra, A., Smith, B. R., Dixon, A. L., & Robertson, B. (2006). Distributed leadership in teams: The network of leadership perceptions and team performance. *The Leadership Quarterly*, 17(3), 232-245. doi:10.1016/j.leaqua.2006.02.003
- Morrow, J. (1999). The teacher shortage: Wrong diagnosis, phony cures. *Education Week*, 64, 48.

- Messick, S. (1995). Validity of psychological assessment: Validation of inferences from persons' responses and performances as scientific inquiry into score meaning. *American psychologist*, 50(9), 741.
- Mueller, C. W., Boyer, E. M., Price, J. L., & Iverson, R. D. (1994). Employee attachment and noncoercive conditions of work the case of dental hygienists. *Work and occupations*, 21, 179-212. doi:10.1177/0730888494021002002
- Mueller, C. W., & Lawler, E. J. (1996). Commitment to different foci: The case of nested organizational units. *Department of Sociology*. The University of Iowa, Iowa.
- Muijs, D., & Harris, A. (2003). Teacher leadership-Improvement through empowerment? An overview of the literature. *Educational Management & Administration*, 31, 437-448. doi:10.1177 /0263211X030314007
- Muijs, D., & Harris, A. (2007). Teacher leadership in (In) action three case studies of contrasting schools. *Educational management administration & leadership*, 35, 111-134. doi:10.1177/17411 43207071387
- Murgatroyd, S., & Reynolds, D. (1984). The creative consultant: The potential use of consultancy as a method of teacher education. *School Organisation*, 4, 321-335. doi:10.1080/026 0136840040405
- Murphy, J. (Ed.). (2005). *Connecting teacher leadership and school improvement*. Corwin Press.
- National Policy Board for Educational Administration (2015, October). Educational leadership policy standards: ISLLC 2015. Washington, DC: Author. Retrieved from: <http://www.ccsso.org/Documents/2015/ProfessionalStandardsforEducationalLeaders2015forNPBEAFINAL.pdf>.

- Neuman, M., & Simmons, W. (2000). Leadership for student learning. *The Phi Delta Kappan*, 82, 9-12. doi:10.1177/003172170008200105
- No Child Left Behind Act of 2001: Qualifications for Teachers and Professionals, 20 U.S.C. § 6319 (2008). Retrieved from: <http://www2.ed.gov/policy/elsec/leg/esea02/107-110.pdf>
- North Carolina Professional Teaching Standards Commission. (2008). North Carolina Professional Teaching Standards. Retrieved from <http://www.ncptsc.org/Final%20Standards%20Document.pdf>
- Odland, G., & Ruzicka, M. (2009). An investigation into teacher turnover in international schools. *Journal of Research in International Education*, 8, 5-29. doi:10.1177/1475240908100679
- Ovando, M. N. (1994). Effects of teachers' leadership on their teaching practices. Retrieved from ERIC database. (ED380446)
- Paradise, L. V., & Wall, S. M. (1986). Children's perceptions of male and female principals and teachers. *Sex Roles*, 14(1), 1-7. doi:10.1007/BF00287843
- Pearson, L. C., & Moomaw, W. (2005). The relationship between teacher autonomy and stress, work satisfaction, empowerment, and professionalism. *Educational research quarterly*, 29, 37. Retrieved from: <http://ezaccess.libraries.psu.edu/login?url=http://search.proquest.com.ezaccess.libraries.psu.edu/docview/216183844?accountid=13158>
- Portugal, E., & Yukl, G. (1994). Perspectives on environmental leadership. *The Leadership Quarterly*, 5(3), 271-276.
- Pounder, D. G., Ogawa, R. T., & Adams, E. A. (1995). Leadership as an organization-wide phenomena: Its impact on school performance. *Educational Administration Quarterly*, 31, 564-588. doi:10.1177/0013161X9503100404

- Price, H. E. (2012). Principal–teacher interactions: How affective relationships shape principal and teacher attitudes. *Educational Administration Quarterly*, 48(1), 39-85. Retrieved from: <http://sk8es4mc2l.scholar.serialssolutions.com/?sid=google&auinit=HE&aulast=Price&atitle=Principal%E2%80%93teacher+interactions:+How+affective+relationships+shape+principal+and+teacher+attitudes&id=doi:10.1177/0013161X11417126&title=Educational+administration+quarterly&volume=48&issue=1&date=2012&spage=39&issn=0013-161X>
- Printy, S., Marks, H., & Bowers, A. (2010). Integrated leadership: How principals and teachers share transformational and instructional influences. *Jsl*, 19(5), 504.
- Rayner, S., & Gunter, H. (2005). Rethinking leadership: perspectives on remodeling practice. *Educational Review*, 57, 151-161. doi:10.1080/0013191042000308332
- Rice, E.M. and Schneider, G.T. (1994), "A decade of teacher empowerment: an empirical analysis of teacher involvement in decision making, 1980-1991". *Journal of Educational Administration*, 32. 43-58. Retrieved from: <http://dx.doi.org/10.1108/09578239410051844>
- Rowland, G., & Adams, A. M. (1999). Systems thinking in instructional design. In *design approaches and tools in education and training* (pp. 29-44). Springer Netherlands. doi: 10.1007/ 978-94-011-4255-7\_3
- Robinson, V. M., Lloyd, C. A., & Rowe, K. J. (2008). The impact of leadership on student outcomes: An analysis of the differential effects of leadership types. *Educational administration quarterly*. doi:10.1177/0013161X08321509
- Rosenholtz, S. 1989. "Workplace Conditions That Affect Teacher Quality and Commitment: Implications for Teacher Induction Programs." *The Elementary School Journal* 4, 420-439. doi:10.1086/461584.

- Sammons, P. (1995). *Key characteristics of effective schools: A review of school effectiveness research*. B & MBC Distribution Services, 9 Headlands Business Park, Ringwood, Hants BH24 3PB, England, United Kingdom. Retrieved from ERIC database. (ED389826)
- Sammons, P., Gu, Q., Day, C., & Ko, J. (2011), "Exploring the impact of school leadership on pupil outcomes: Results from a study of academically improved and effective schools in England". *International Journal of Educational Management* 25, 83 - 101. Retrieved from: <http://dx.doi.org/10.1108/09513541111100134>
- Scribner, J. P., Sawyer, R. K., Watson, S. T., & Myers, V. L. (2007). Teacher teams and distributed leadership: A study of group discourse and collaboration. *Educational Administration Quarterly*, 43, 67-100. doi:10.1177/0013161X06293631
- Smith, R. J., & Levinson, J. D. (2011). The impact of implicit racial bias on the exercise of prosecutorial discretion. *Seattle UL Rev.*, 35, 795. Retrieved from: <http://digitalcommons.law.seattleu.edu/cgi/viewcontent.cgi?article=2082&context=sulr>
- Smith, S.C., & Piele, P.K. (Eds.). (1997). *School leadership. Handbook for excellence*. Eugene, OR: ERIC Clearinghouse on Educational Management.
- Smith, T. M., & Ingersoll, R. M. (2004). What are the effects of induction and mentoring on beginning teacher turnover? *American Educational Research Journal*, 41(3), 681-714. Retrieved from: <http://ezaccess.libraries.psu.edu/login?url=http://search.proquest.com.ezaccess.libraries.psu.edu/docview/200367436?accountid=13158>
- Smith, W. C., & Persson, A. M. (2016). Teacher Satisfaction in High Poverty Schools: Searching for Policy Relevant Interventions in Estonia, Georgia, and Latvia. *Вопросы образования*, (2 (eng)). Retrieved from: <http://cyberleninka.ru/article/n/teacher->

satisfaction-in-high-poverty-schools-searching-for-policy-relevant-interventions-in-estonia-georgia-and-latvia

Somech, A. (2010). Participative decision making in schools: A mediating-moderating analytical framework for understanding school and teacher outcomes. *Educational Administration Quarterly*, 46(2), 174-209. doi:10.1177/1094670510361745

Somekh, B., & Lewin, C. (2005). *Research methods in the social sciences*. Sage.

Spillane, J.P. (2006). *Distributed Leadership*. San Francisco, CA: Jossey-Bass.

Spillane, J. P. (2012). *Distributed leadership* (Vol. 4). John Wiley & Sons.

Spillane, J. P., & Camburn, E. (2006). The practice of leading and managing: The distribution of responsibility for leadership and management in the schoolhouse. *American Educational Research Association*. Retrieved from: [https://learning-connections.org/sites/default/files/meetingpaper/992\\_aera2006thepracticeofleadingandmanaging.pdf](https://learning-connections.org/sites/default/files/meetingpaper/992_aera2006thepracticeofleadingandmanaging.pdf)

Spillane, J. P., & Healey, K. (2010). Conceptualizing school leadership and management from a distributed perspective: An exploration of some study operations and measures. *The elementary school journal*, 111(2), 253-281.

Spillane, J. P., Diamond, J. B., and Jita, L. 2003. Leading instruction: The distribution of leadership for instruction. *Journal of Curriculum Studies*, 35(5), 533-543. doi: 10.1080/0022027021000041972

Spillane, J. P., Camburn, E. M., & Stitzel Pareja, A. (2007). Taking a distributed perspective to the school principal's workday. *Leadership and Policy in Schools*, 6(1), 103-125. . Retrieved from: <http://dx.doi.org/10.1080/15700760601091200>

Spillane, J. P., Camburn, E., Lewis, G., & Pareja, A. S. (2006, April). Taking a distributed perspective in studying school leadership and management: Epistemological and

- methodological trade-offs. In *annual meeting of the American Educational Research Association, San Francisco*. doi: 10.1108/095782308 10863262
- Spillane, J. P., Camburn, E. M., Pustejovsky, J., Pareja, A. S., & Lewis, G. (2009). Taking a distributed perspective in studying school leadership and management: the challenge of study operations. *Distributed leadership*, 47-80. Springer Netherlands. doi:10.1007/978-1-4020-9737-9-4
- Spillane, J. P., and Diamond, J.B. (2007). *Distributed Leadership in Practice*. New York: Teachers College Press
- Spillane, J. P., & Coldren, A. F. (2015). *Diagnosis and design for school improvement: Using a distributed perspective to lead and manage change*. Teachers College Press.
- Spillane, James P., John B. Diamond, and Loyiso Jita. (2003). Leading instruction: The distribution of leadership for instruction. *Journal of Curriculum Studies* 35, 533–543. doi: 10.080 /0022027021000041972
- Spillane, J. P., Halverson, R., & Diamond, J. B. (1999). *Distributed leadership: Toward a theory of school leadership practice*. Evanston, IL: Institute for Policy Research, Northwestern University. Retrieved from <http://www.sesp.northwestern.edu/docs/twdsldrpracticeSPIHALDIA.pdf>
- Spillane, James P., Richard Halverson, and John B. Diamond. 2001. Investigating school leadership practice: A distributed perspective. *Educational Researcher* 30, 23–28. doi: <http://www.jstor.org/stable/3594470>
- Spillane, J. P., Halverson, R., & Diamond, J. B. (2004). Towards a theory of leadership practice: A distributed perspective. *Journal of curriculum studies*, 36, 3-34. doi:10.1080/0022027032000 106726.

- Storey, J. (2004). *Leadership in organizations: Current issues and key trends*. Psychology Press.  
Retrieved from [http://www.englishplaza.vn/flexpaper/pdf/leadership\\_1406046611.pdf](http://www.englishplaza.vn/flexpaper/pdf/leadership_1406046611.pdf).
- Timperley, H. S. (2005). Distributed leadership: Developing theory from practice. *Journal of curriculum studies*, 37, 395-420. doi: <http://dx.doi.org/10.1080/00220270500038545>
- Timperley, H. (2009). Distributing leadership to improve outcomes for students. *Distributed leadership according to the evidence*, 197-222.
- Trammell, J. M. (2016). *The relationship between distributed leadership and teacher affective commitment in public and private schools*. (Doctoral dissertation, Carson-Newman University). Retrieved from: [http://www.cn.edu/libraries/tiny\\_mce/tiny\\_mce/plugins/filemanager/files/Dissertations/John\\_Matt\\_Trammell.pdf](http://www.cn.edu/libraries/tiny_mce/tiny_mce/plugins/filemanager/files/Dissertations/John_Matt_Trammell.pdf)
- Tyack, D. B., & Hansot, E. (1982). *Managers of virtue: Public school leadership in America, 1820-1980*. Basic Books. Retrieved from: <http://www.jstor.org/stable/42589038>
- Uhl-Bien, M. (2006). Relational leadership theory: exploring the social processes of leadership and organizing. *Leadership Quarterly*, 17, 654-676.
- Urlick, A. (2016). The influence of typologies of school leaders on teacher retention: A multilevel latent class analysis. *Journal of Educational Administration*, 54(4), 434-468. doi: 10.1108/JA-08-2014-0090
- Urlick, A., & Bowers, A. J. (2014). What are the different types of principals across the United States? A latent class analysis of principal perception of leadership. *Educational Administration Quarterly*, 50, 96-134. doi:10.1177/0013161X13489019
- Vroom, V. H., & Jago, A. G. (2007). The role of the situation in leadership. *American psychologist*, 62, 17. doi:<http://dx.doi.org/10.1037/0003-066X.62.1.17>

- Wahlstrom, K. L., & Louis, K. S. (2008). How teachers experience principal leadership: The roles of professional community, trust, efficacy, and shared responsibility. *Educational administration quarterly*, 44, 458-495. doi:10.1177/0013161X08321502
- Wang, M. T., & Eccles, J. S. (2014). Multilevel predictors of math classroom climate: A comparison study of student and teacher perceptions. *Journal of Research on Adolescence*.
- Weiss, C. H., & Cambone, J. (1994). Principals, shared decision making, and school reform. *Educational Evaluation and Policy Analysis*, 16(3), 287-301. doi:10.3102/01623737016003287
- Wilcoxon, F. (1945). Individual comparisons by ranking methods. *Biometrics bulletin*, 1(6), 80-83.
- Williams, C. L. (2000). The glass escalator: Hidden advantages for men in the “female” professions. *Gender basics: Feminist perspectives on women and men*, 158-165.
- Williams, K., & O'Reilly, C. (1998). Demography and diversity in organizations: A review of 40 years of research. *Research in Organizational Behavior*, 20, 77–140. Retrieved from: [https://www.researchgate.net/profile/Charles\\_OReilly/publication/234022034\\_Demography\\_and\\_Diversity\\_in\\_Organizations\\_A\\_Review\\_of\\_40\\_Years\\_of\\_Research/links/55b0f45d08aec0e5f430e49e.pdf](https://www.researchgate.net/profile/Charles_OReilly/publication/234022034_Demography_and_Diversity_in_Organizations_A_Review_of_40_Years_of_Research/links/55b0f45d08aec0e5f430e49e.pdf)
- Woods, P. A., Bennett, N., Harvey, J. A., & Wise, C. (2004). Variabilities and dualities in distributed leadership findings from a systematic literature review. *Educational Management Administration & Leadership*, 32(4), 439-457. doi:10.1177/1741143204046497

- Youngs, H. (2009). (Un) critical times? Situating distributed leadership in the field. *Journal of Educational Administration and History*, 41, pp. 377–389. doi:10.1080/00220620903211588
- Zembylas, M., & Papanastasiou, E. C. (2005). Modeling teacher empowerment: The role of job satisfaction. *Educational Research and Evaluation*, 11, 433-459. doi: <http://dx.doi.org/10.1080/13803610500146152>
- Zheng, W., Yang, B., & McLean, G. N. (2010). Linking organizational culture, structure, strategy, and organizational effectiveness: Mediating role of knowledge management. *Journal of Business research*, 63, 763-771. doi:10.1016/j.jbusres.2009.06.005

## **Appendix A**

### **North Carolina Teacher Working Condition 2005-2006 Survey**

The North Carolina Teacher Working Condition 2005-2006 Survey is available at the following link: <https://scholarsphere.psu.edu/downloads/6hd76rz83x>

## Appendix B

### Teachers: Factors of the Distributive leadership function with items and their factor loadings

2006 TWCS items	LF (1)	TPE (2)	CTW (3)	DM- PPI (4)	DM- INST (5)
There is an atmosphere of trust and mutual respect within the school.	<b>0.66</b>	0.32	0.17	0.17	0.19
The faculty are committed to helping every student learn.	0.39	<b>0.43</b>	0.12	0.12	0.00
The school leadership communicates clear expectations to students and parents.	<b>0.71</b>	0.36	0.16	0.14	0.10
The school leadership shields teachers from disruptions, allowing teachers to focus on educating students.	<b>0.71</b>	0.23	0.18	0.17	0.11
The school leadership consistently enforces rules for student conduct.	<b>0.78</b>	0.22	0.15	0.18	0.04
The school leadership support teachers' efforts to maintain discipline in the classroom.	<b>0.78</b>	0.24	0.13	0.14	0.11
Opportunities are available for members of the community to contribute actively to this school's success.	<b>0.41</b>	0.39	0.20	0.22	0.04
The school leadership consistently supports teachers.	<b>0.75</b>	0.32	0.16	0.16	0.17
<b>The faculty and staff have a shared vision.</b>	<b>0.60</b>	<b>0.41</b>	0.22	0.20	0.11
Teachers are held to high professional standards for delivering instruction.	0.36	<b>0.62</b>	0.16	0.10	0.04
Teacher performance evaluations are handled in an appropriate manner.	0.31	<b>0.81</b>	0.14	0.11	0.17
The procedures for teacher performance evaluations are consistent.	0.31	<b>0.80</b>	0.14	0.12	0.16
Teachers receive feedback that can help them improve teaching.	0.34	<b>0.75</b>	0.19	0.12	0.15
Teachers are centrally involved in decision making about educational issues.	<b>0.56</b>	0.12	0.27	0.34	0.32
<b>Teachers are trusted to make sound professional decisions about instruction.</b>	<b>0.53</b>	0.14	0.22	0.16	<b>0.48</b>
In this school we take steps to solve problems.	<b>0.69</b>	0.25	0.21	0.24	0.20
The faculty has an effective process for making group decisions and solving problems.	<b>0.65</b>	0.20	0.25	0.29	0.22
Selecting instructional materials and resources	0.16	0.13	0.15	0.32	<b>0.66</b>
Devising teaching techniques	0.20	0.13	0.10	0.14	<b>0.81</b>
Setting grading and student assessment practices	0.09	0.07	0.11	0.10	<b>0.78</b>
Determining the content of in-service professional development programs	0.20	0.13	0.26	<b>0.57</b>	0.32
Providing input on how the school budget will be spent	0.38	0.12	0.14	<b>0.59</b>	0.18

School improvement planning	0.18	0.10	0.13	<b>0.77</b>	0.10
Establishing and implementing policies and student discipline	0.12	0.07	0.06	<b>0.75</b>	0.06
The selection of teachers new to this school	0.29	0.19	0.15	<b>0.61</b>	0.24
Teachers have time available to collaborate with their colleagues.	0.26	-0.04	0.55	0.01	0.16
Sufficient funds and resources are available to allow teachers to take advantage of professional development activities.	0.08	0.12	<b>0.71</b>	0.15	0.10
Professional development provides teachers with the knowledge and skills most needed to teach effectively.	0.23	0.27	<b>0.61</b>	0.19	0.08
Teachers are provided opportunities to learn from one another.	0.23	0.20	<b>0.70</b>	0.13	0.09
Adequate time is provided for professional development.	0.14	0.18	<b>0.79</b>	0.14	0.07

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Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

Rotation converged in 7 iterations.

## Appendix C

### Principals: Factors of the Distributive leadership function with items and their factor loadings

2006 TWCS items	LF (1)	DM (2)	CTW (3)	DM-PPI (4)	TPE (5)	DM- INST (6)
There is an atmosphere of trust and mutual respect within the school.	<b>0.77</b>	0.04	0.00	0.01	0.17	0.02
The faculty are committed to helping every student learn.	<b>0.57</b>	0.02	-0.01	0.14	0.22	-0.14
The school leadership communicates clear expectations to students and parents.	<b>0.82</b>	0.05	0.02	0.00	0.15	0.02
The school leadership shields teachers from disruptions, allowing teachers to focus on educating students.	<b>0.82</b>	0.04	0.02	-0.03	0.04	0.05
The school leadership consistently enforces rules for student conduct.	<b>0.87</b>	0.05	0.02	-0.02	0.00	0.05
The school leadership support teachers' efforts to maintain discipline in the classroom.	<b>0.87</b>	0.04	0.01	-0.04	0.02	0.08
Opportunities are available for members of the community to contribute actively to this school's success.	<b>0.60</b>	0.03	-0.01	0.10	0.22	-0.09
The school leadership consistently supports teachers.	<b>0.85</b>	0.04	0.01	-0.03	0.14	0.06
The faculty and staff have a shared vision.	<b>0.75</b>	0.05	0.02	0.05	0.25	-0.04
<b>Teachers are held to high professional standards for delivering instruction.</b>	<b>0.55</b>	0.01	0.01	0.09	<b>0.47</b>	-0.09
<b>Teacher performance evaluations are handled in an appropriate manner.</b>	<b>0.51</b>	0.03	0.02	-0.01	<b>0.77</b>	0.03
<b>The procedures for teacher performance evaluations are consistent.</b>	<b>0.52</b>	0.02	0.02	-0.01	<b>0.76</b>	0.04
<b>Teachers receive feedback that can help them improve teaching.</b>	<b>0.54</b>	0.02	0.02	-0.02	<b>0.70</b>	0.02
Teachers are centrally involved in decision making about educational issues.	0.04	<b>0.78</b>	0.14	0.30	0.02	0.08
Teachers are trusted to make sound professional decisions about instruction.	0.07	<b>0.78</b>	0.14	0.16	0.01	0.17
In this school we take steps to solve problems.	0.07	<b>0.80</b>	0.15	0.15	0.03	0.10
The faculty has an effective process for making group decisions and solving problems.	0.08	<b>0.82</b>	0.16	0.19	0.01	0.03
<b>Selecting instructional materials and resources</b>	0.03	0.13	0.06	<b>0.44</b>	0.00	<b>0.57</b>
Devising teaching techniques	0.05	0.14	0.04	0.24	0.02	<b>0.75</b>
Setting grading and student assessment practices	-0.06	0.08	0.14	0.14	-0.01	<b>0.76</b>
Determining the content of in-service professional development programs	0.03	0.12	0.14	<b>0.65</b>	0.00	0.21
Providing input on how the school budget will be spent	0.02	0.14	0.12	<b>0.69</b>	0.00	0.10
School improvement planning	0.03	0.14	0.07	<b>0.69</b>	0.01	0.08
The selection of teachers new to this school	0.01	0.22	0.03	<b>0.61</b>	0.03	0.09
Teachers have time available to collaborate with their colleagues.	-0.03	0.23	<b>0.51</b>	-0.14	0.04	0.33

Sufficient funds and resources are available to allow teachers to take advantage of professional development activities.	0.03	0.02	<b>0.74</b>	0.08	-0.02	0.04
Professional development provides teachers with the knowledge and skills most needed to teach effectively.	0.04	0.18	<b>0.75</b>	0.19	0.00	0.01
Teachers are provided opportunities to learn from one another.	0.01	0.15	<b>0.74</b>	0.19	0.03	0.03
Adequate time is provided for professional development.	-0.01	0.11	<b>0.82</b>	0.03	0.02	0.06

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Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 7 iterations.

## Appendix D

### Teachers: Factors of the Distributive leadership function with items and their factor

2006 TWCS Items	LF	DM
Teachers are centrally involved in decision making about educational issues.	0.27	0.82
Opportunities are available for members of the community to contribute	0.54	0.32
<b>In this school, we take steps to solve problems.</b>	<b>0.43</b>	<b>0.77</b>
The faculty has an effective process for making group decisions and solving	0.33	0.85
<b>There is an atmosphere of trust and mutual respect within the school.</b>	<b>0.55</b>	<b>0.58</b>
<b>The school leadership communicates clear expectations to students and</b>	<b>0.77</b>	0.33
The school leadership shields teachers from disruptions, allowing teachers to	<b>0.76</b>	0.33
The school leadership consistently enforces rules for student conduct.	<b>0.84</b>	0.28
The school leadership support teachers' efforts to maintain discipline in the	<b>0.86</b>	0.28
The school leadership consistently supports teachers.	<b>0.79</b>	0.39

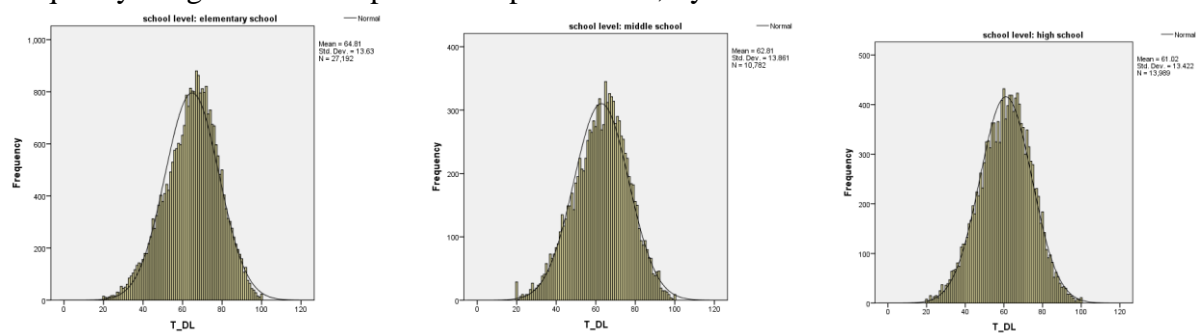
Extraction Method: Principal Component Analysis.

Rotation converged in 3 iterations.

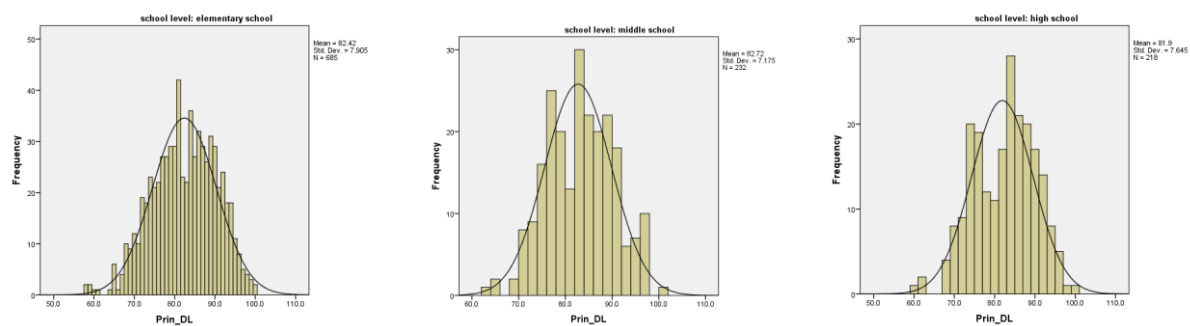
## Appendix E

### Pearson's Correlation Assumptions

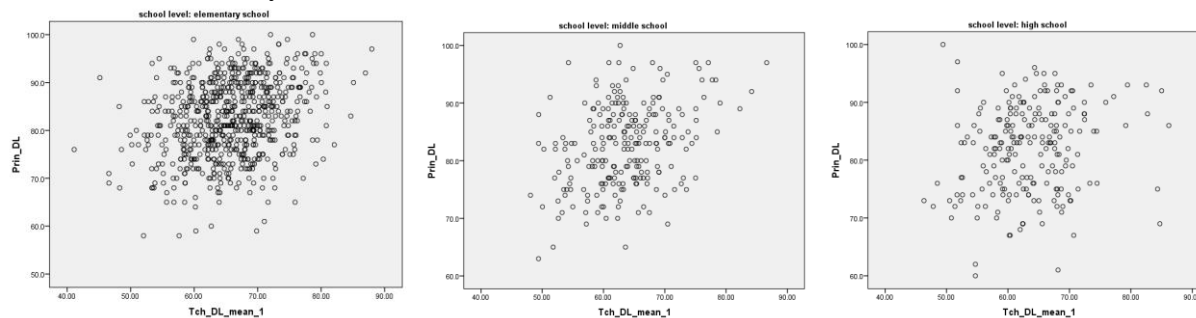
Frequency Diagram of Principals' Perception of DL, by school level



Frequency Diagram of Principals' Perception of DL, by school level  
Normal Distribution Assumption



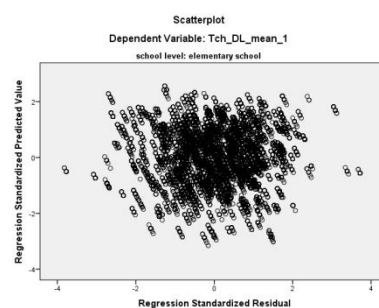
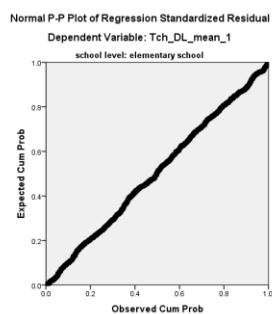
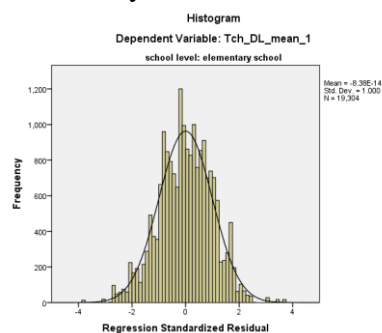
Linear distribution, by school level



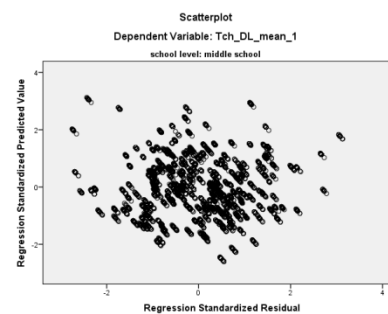
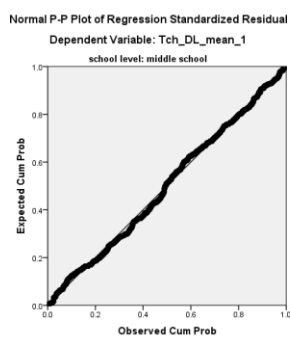
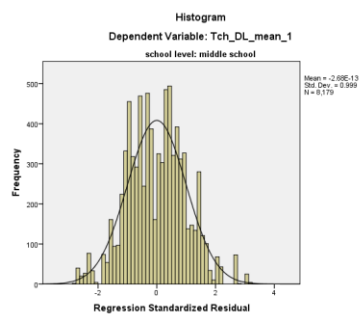
## Appendix F

### Regression linearity and normality assumptions by school level

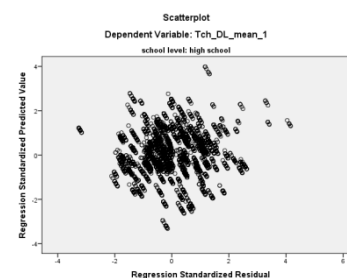
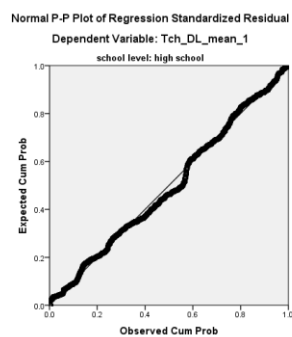
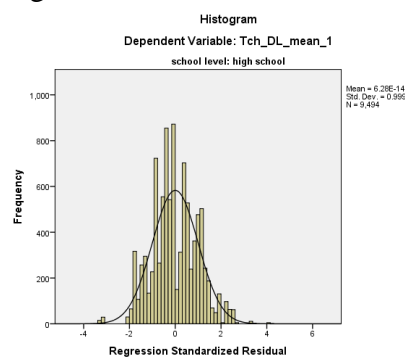
#### Elementary School



#### Middle School



#### High School



## VITA

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### EDUCATION

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Doctoral of Philosophy in Educational Leadership  
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- Research Interests: Distributed Leadership, Principal and Teacher turnover, Research and instrument Design.
- Dissertation: *"The Relationship between Principals' Distributed Leadership and Teacher Turnover in North Carolina schools"*

M. Ed. Educational Leadership  
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Aug 2013- Aug 2015

### TEACHING/PROFESSIONAL EXPERIENCE:

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**Natural Science Teacher**  
Luis Monsalve P. High School, Cuenca, Ecuador  
8th, 9th, and 10th grades

Oct 2011/Aug 2012

**Anatomy, Biology, and Chemistry Teacher**  
Gonzalo Cordero D. High School, Sigüig, Ecuador  
1st, 2nd, and 3th grades

Jan 2011/Apr 2011

### SKILLS

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- Proficient in statistical analysis and software (SPSS).
- Proficient use of qualitative data analysis (NVivo)
- Experience with statistical analysis: Correlation, Multiple Regression, Logistic Regression, Hierarchical Linear Modeling (HLM), and Hazard/Survival Modeling.
- Spanish (Native speaker), and French (basic).