SCHOOL ACCOUNTABILITY AND PRINCIPAL BEHAVIORS

by

Laura Casey Amo
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ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

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ABSTRACT

School accountability policies were created in response to concerns that the United States was under-performing and losing its position as an international leader in education. These policies are currently an integral part of the American educational system. The effectiveness of school accountability policies, however, remains unclear and research on how performance-based accountability is related to principal behavior is largely undeveloped. This dissertation examined the relationships between performance-based school accountability and the behaviors of school principals. Using a nationally-representative database of public elementary schools (the Schools and Staffing Survey 2003-04), this dissertation explored the associations between different aspects of performance-based educational policy on principal work engagement, supportive leadership, and shared instructional leadership. Findings suggest that most associations between performance-based rewards and interventions and principal behaviors are negligible or negative. State policy for rewards had a negative association with supportive leadership, and state policy for intervention had a negative association with principal engagement. Among schools meeting all performance goals in the previous academic year, nearly all of the associations were statistically negligible; the only significant association was that between exposure to school-wide monetary rewards and principal engagement. Specifically, exposure to school-wide monetary reward had a significant negative association with principal engagement. Among schools failing to meet all performance goals in the previous academic year, exposure to intervention was negatively related to all three principal behaviors and three associations were statistically significant. Specifically, exposure to evaluation cycle was associated with significantly less supportive leadership, exposure to reduced resources was associated with significantly less shared instructional leadership, as was exposure to school choice. The interactions with school size and school poverty varied by type of incentive and by principal behavior, and generally suggest that the relationships between policy and principal behavior are stable across different contexts. Findings from this dissertation resound previous concerns with present performance-driven school accountability policy and introduce a new point of concern into the argument against the practice. While negative associations between accountability policy and principal behaviors may not be deemed directly pertinent to the bottom line (i.e. student achievement), that the only significant relationships are negative is an important consideration and refutes the theory of action in accountability. Reconsideration of performance-based accountability is recommended, as neither reward nor intervention consistently related positively to principal behavior; state policy for reward and intervention, exposure to monetary rewards, and exposure to nearly all interventions were negatively related to at least one principal behavior.

CHAPTER ONE:

OVERVIEW

School accountability policies are complex and manifest in different ways at various points in the educational system. School accountability refers to processes for evaluating how a school is performing based on student performance measures (Figlio & Loeb, 2011); it is a very broad concept that is used to describe extremely different types of policies in education. For example, there are market-based accountability systems designed to hold schools accountable to parents (i.e. school choice), peer-based systems designed to hold teachers more accountable for student performance (i.e. Race to the Top), student-based systems designed to motivate students to achieve (i.e. minimum-competency tests and graduation exams), and school-based systems designed to hold schools and administrators more accountable for student performance.

Over the past 10 years, the number of states that reward high performance or school improvement has increased, and so has the number of states that intervene in low-performing schools (Editorial Projects in Education Research Center [EPE], 2013). However, the increased emphasis on school accountability is not backed by evidence that such accountability policies are associated with positive school or student outcomes. In fact, most research suggests that such policies make little to no difference in student outcomes. For example, financial incentives for teachers based on school performance have not been linked to increased student achievement (Bacolod et al. 2011), attendance, or graduation rates (Fryer, 2011). Similarly, schools that were targeted for intervention do not perform any differently on standardized achievement tests compared to similar schools not targeted for intervention (Ahn & Vigdor, 2013) and in some instances, these schools performed worse (Lee, Shin, & Amo, 2013).

Beyond there being very little evidence that school accountability policies positively impact student outcomes, there has been limited research on the relationships between school accountability policies and organizational outcomes such as principal engagement and leadership. Research on school accountability tends to use data from before No Child Left Behind [NCLB] (Billger, 2007; Marks & Nance, 2007; Smith, 1991; Weathers, 2011) or data from within a single district or state (e.g. Jacobson et al., 2004; Sun & Youngs, 2009; Daly, Der-Martirosian, Ong-Dean, Park, &Wishard-Guerra, 2011) while other research has focused on how state policy is related to student achievement and academic outcomes (e.g. Lee, 2010; Lee & Reeves, 2012; Lee & Amo, 2013; Ahn & Vigdor, 2013; Saw, Chen, Schneider, & Frank, 2011). There is some research that has been conducted using data from post-NCLB years (e.g. Schools and Staffing Survey 2003-04) to examine principal-related outcomes (e.g. Price, 2011) however this research did not consider the impact of accountability policy.

Overall, there has not been sufficient investigation into how rewards and interventions in different states and districts are associated with principal behavior in the post-NCLB era. Moreover, there has been no investigation of how different types of rewards and interventions are associated with principal behaviors. Improving student achievement is the ultimate goal in the school accountability movement, and some may argue that the relationships between policy and principals are too far removed from this "bottom line." However, the impact that accountability policy has on principal behaviors is important to explore; if there are negative relationships between policy initiatives and principal behavior, this may trickle down to negatively impact student outcomes. The outcomes in this dissertation study – principal work engagement, supportive leadership, and shared instructional leadership – are related to school performance and positive school climate (Rice, 2010; Jacobson, 2008; Federici & Skaalvik,

2011; Bakker, Gierveld, & Van Rijkswijk, 2006) yet have not been examined in relation to school accountability policy. Moving forward with policy initiatives such as Race to the Top and NCLB waiver-based policy focused on school performance and improvement, it is important to evaluate different rewards and interventions in relation to principal behaviors in order to determine the specific aspects of school accountability policy that are making a difference.

The three dependent variables in this dissertation are work engagement, supportive leadership, and shared instructional leadership. Briefly, principal work engagement is a principal's commitment to, involvement with, and satisfaction with work. Supportive leadership is the extent to which a principal's teachers believe the principal expresses emotional backing and support to the staff. Shared instructional leadership is a type of leadership in which principals share instructional and curricular decision-making and influence with teachers. These behaviors are related to outcomes such as principal satisfaction (Jackson & Marriott, 2012), principal retention (Fraser & Brock, 2006), positive school climate (Hughes & Pickerall, 2013), and school achievement (Marks & Printy, 2003) and reflect optimal practice among school principals.

The three independent variables reflect different dimensions of school accountability: state policy for rewards and/or intervention, exposure to reward, and exposure to intervention. Performance-based rewards include monetary remuneration for school-wide investment, monetary remuneration for teachers, and nonmonetary recognition. Performance-based interventions include school choice, supplemental educational services, school improvement planning, evaluation cycle, reduction in resources, and state takeover of the school. There are diverse types of school accountability examined in this dissertation: state policy for reward and

intervention, market-based interventions (i.e. school choice), peer-based rewards (i.e. teacher rewards), and school-based interventions (i.e. school takeover) and rewards (i.e. school-wide monetary rewards and nonmonetary rewards for schools).

The purposes of this dissertation were to determine (a) whether state policy for receiving rewards and/or for interventions was associated with the three principal behaviors, (b) whether exposure to performance-based rewards was associated with principal behaviors in schools that met all performance goals in the previous academic year, and (c) whether exposure to performance-based interventions was associated with principal behaviors in schools that failed to meet all performance goals in the previous academic year. Additionally, this dissertation sought to examine these relationships in context of school size and school poverty. The research questions guiding this dissertation relate to different dimensions of school accountability policy in relation to principal behaviors:

1. Is state policy for reward and/or intervention associated with a principal's behaviors, specifically: (a) engagement, (b) supportive leadership, and/or (c) shared leadership over instruction?
2. Is exposure to reward associated with principal behaviors in schools meeting all performance goals in the previous year?
3. Is exposure to intervention associated with principal behaviors in schools failing to meet all performance goals in the previous year?
4. Are there interactions between school context (size and poverty) and school accountability policy in relation to principal behaviors?

The conceptual framework in this dissertation is the theory of action of accountability (Smith & O'Day, 1990; O'Day, 2002; Figlio & Ladd, 2007). This theory posits that performance-based accountability will motivate school leaders to behave in ways that are aligned with school success. There is theoretical evidence (Smith & O'Day, 1990; Elmore, 1996) and

empirical evidence (O'Day, 2002) that this theory does not hold and in this dissertation, the theory of action of accountability is explicitly challenged. Directional hypotheses are posited for the first three research questions, while the fourth research question does not have a directional hypothesis. Briefly, all three dimensions of performance-based accountability policy are hypothesized to be negatively related to principal behaviors. Further explanation of the conceptual framework as well as rationale for each of the hypotheses is provided in greater depth in Chapter Two.

This dissertation will contribute to the body of research on performance-based accountability in three main areas: research, policy, and theory. Performance-based accountability remains popular in the U.S. yet its impact on principal behaviors is completely unexamined. First and foremost, this dissertation establishes the importance of such investigation and lays the groundwork for further research of the relationships between performance-based accountability and principal behaviors. Secondly, this dissertation examines different dimensions of accountability in relation to principal behaviors. Three different dimensions of performance-based accountability are explored, each with distinct samples and different implications. This approach provides a more detailed picture of the overall relationship between performance-based accountability and principal behaviors, and offers insight into best practices and policy reform. Third, this dissertation examines how the theory of action of accountability holds up (or fails to hold up) based on empirical evidence. The school accountability movement has hinged on theory that performance-based accountability produces better student outcomes through improved teaching and leadership practices. If findings from this dissertation show otherwise, new theories will need to be adapted and tested.

CHAPTER TWO:

SCHOOL ACCOUNTABILITY AND PRINCIPAL BEHAVIORS

This chapter frames the exploration of performance-based accountability by introducing the theory of action of accountability (Smith & O'Day, 1990; Figlio & Loeb, 2011; Figlio & Ladd, 2007) and briefly discussing the issues surrounding external control on organizational systems (Smith & O'Day, 1990; O'Day, 2002). This chapter also provides an overview of the dependent and independent variables that are examined in this dissertation, and concludes with a specific outline of the hypotheses related to the four research questions.

Theoretical Foundation of School Accountability

The theory of action of accountability purports that incentives such as rewards and interventions will drive educators and school leaders to behave in ways that improve student learning (Smith & O'Day, 1990; Figlio & Ladd, 2007). According to the theory of action of accountability (Smith & O'Day, 1990; Figlio & Ladd, 2007), holding educators and school leaders accountable for student achievement (i.e. performance-based accountability) will motivate them to align behaviors and instructional practices to increase student achievement. This theory has several assumptions that are rarely upheld. The theory assumes that school conditions and context are uniform, equitable, and stable (O'Day, 2002); schools and classrooms, however are extremely dynamic and diverse, and accountability policies have done very little to advance educational equity (Lee & Wong, 2004).

Another assumption of performance-based accountability is that external forces, such as state policy and exposure to rewards or interventions, actually have the capacity to impact the

internal processes of schools (O'Day, 2002). However, theoretical work (e.g. Elmore, 1996) and policy implementation studies in the school accountability literature (e.g. Lee, Shin, & Amo, 2013) demonstrate that implementation of policy does not ensure positive change in organizational processes or student outcomes. As discussed by Elmore (1996), large-scale reform efforts such as performance-based accountability do very little in the way of changing the most important aspects of teaching and learning (i.e. raising educational standards and expectations, implementing more challenging educational material, and using effective instructional techniques). When external forces (i.e. the government) impose control (i.e. performance-based incentives) on schools, the internal structure of the school may actually be adversely affected (Shipps, 2012; O'Day, 2002). Likewise, policy implementation studies demonstrate that performance-based interventions are not associated with improvement in student achievement gains (Lee, Shin, & Amo, 2013).

Thus, while the premise of performance-based accountability may be to enact positive change among school leaders and educators in order to improve student learning and achievement, there are fundamental flaws in its assumptions. For one, the implicit assumption that schools are uniform and stable is often violated. Secondly, the external accountability measures imposed upon schools tend not to have the desired positive impact on school outcomes. In this dissertation, the theory of action of accountability is challenged and these policies are hypothesized to have the opposite effect on principal behaviors; state policy for reward/intervention, exposure to rewards, and exposure to interventions are all expected to have a negative impact on principal behaviors.

Principal Behaviors

Research consistently shows that principal behavior and leadership strongly influence outcomes such as teacher satisfaction (Jackson & Marriot, 2012; Skaalvik & Skaalvik, 2009), recruitment and retention of high-quality teachers (Ladd, 2009; Beteille, Kalogrides, & Loeb, 2009), and teachers' positive perceptions of working conditions (Bakker, Gierveld, and Van Rijkswijk, 2006; Beteille, Kalogrides, & Loeb, 2009; Rice, 2010). While direct linkages between principals and student achievement are tenuous (Witziers et al., 2003), there is evidence that principals indirectly impact student achievement through teachers and school organization (e.g. Heck & Hallinger, 2009). Principal engagement, supportive leadership, and shared instructional leadership are integral elements in healthy schools, and thus deserve closer attention in relation to school accountability policy. Amidst an era of performance-based educational accountability, attention has squarely been on how accountability directly relates to student achievement with very little consideration of how accountability policy is associated with school leaders' organizational behavior. This dissertation addresses this gap in the literature by examining how different aspects of school accountability policy are associated with three principal behaviors related to school effectiveness and success: work engagement, supportive leadership, and shared instructional leadership.

Principal Work Engagement

The concept of work engagement among principals is derived from the research on work engagement among employees and managers (Schaufeli, Bakker, & Salanova, 2006; DeCelles, Tesluk, & Taxman, 2013; Xanthopoulou et al., 2009). There are a number of definitions of work engagement. Work engagement has been described as "a positive, fulfilling work-related state of

mind that is characterized by vigor, dedication, and absorption" (Schaufeli, Bakker, & Salanova, 2006, p. 702), and a work-related, affective-motivational state of fulfillment (Xanthopoulou et al., 2009). Other researchers describe work engagement as the polar opposite of job burnout (Maslach, Jackson, & Leiter, 1996; Hakanen, Bakker, & Schaufeli, 2006). Some researchers assert that work engagement is distinct from related constructs such as job satisfaction (Schaufeli, Bakker, & Salanova, 2006; Schaufeli, Salanova, Gonzalez-Roma, & Bakker, 2002) however, other definitions of work engagement include job satisfaction, job commitment, and work effort in the definition (CIPD, 2013). In this dissertation, principal work engagement is defined as a principal's commitment to, involvement with, and satisfaction with work.

According to theoretical work by Gardner et al. (2005), leaders who demonstrate high levels of authentic engagement are role models to other employees and this has a powerful impact on an organization. Leaders modeling positive engagement inspire employees or "followers" to be engaged as well, and this is related to individual and group performance. The engagement of school principals may likewise have a positive, catching effect on organizational outcomes; principals who are highly engaged in work as a school leader serve as models to teachers and students and have to potential to influence teacher and student engagement.

In the broader organizational literature, empirical research suggests that leaders who demonstrate strong work engagement have the potential to positively influence subordinates, or other employees. Organizational research has shown that employee engagement has the potential to "cross-over" in work teams. For example, Bakker, Van Emmerik, and Euwema (2006) performed a multilevel analysis on 2,229 workers from 85 teams and found that team-level feelings of engagement were related to individual feelings of engagement, after controlling for

job demands and resources. In other words, engagement can spread across individuals, and leaders have the capacity to incite engagement in other employees.

Empirical studies in the school leadership literature also demonstrate that work engagement among principals is associated with a number of positive outcomes. Principals who are engaged and excited about working as a school leader are more likely to remain in the leadership position (Fraser & Brock, 2006). In a qualitative study of 20 elementary school principals working in Catholic schools in New South Wales, Fraser and Brock (2006) found that retention was associated with statements conveying excitement and engagement in work (e.g. "I like the job" and "Everyday is different because I experience new challenges").

Principal work engagement is also related to self-efficacy. According to research by Federici and Skaalvik (2011), school principals exhibiting higher self-efficacy were more engaged. In a sample of 300 principals in Norway, principal self-efficacy was measured by the Norwegian Principal Self-Efficacy Scale and the subscales for instructional leadership self-efficacy and administrative management self-efficacy were positively related to principal engagement measured by the Ultrecht Work Engagement Scale.

Principals demonstrating strong work engagement in schools tend to be seen more positively by teachers and to demonstrate more creativity. Bakker, Gierveld, and Van Rijkswijk (2006) conducted a study involving 105 female school principals and 232 teachers in primary schools in the Netherlands. The researchers concluded that higher engagement scores among principals were associated with higher teacher-ratings of transformational leadership, or leadership that inspired and stimulated co-workers and teachers. Also, principals who demonstrated higher engagement were also deemed by teachers to be better performers, in terms

of both in-role and extra-role tasks, and to demonstrate more creativity by finding multiple solutions to issues arising in the schools (Bakker et al., 2006).

Principal Work Engagement and School Accountability. The degree to which performance-based policy is associated with principal engagement remains largely unexplored in the literature in school accountability. For example, it is unknown whether school accountability is related to principal engagement or how specific types of rewards or interventions positively or negatively relate to the engagement of a principal. There is one existing study (Shipps, 2012) that provides some insight into this line of research. Shipps (2012) explored how interventions were related to principal empowerment and stress; she reported that principals in schools undergoing reform or intervention were much less empowered to lead and more stressed out relative to principals in other schools. Extending Shipps' research to work engagement as an outcome, principals may be less engaged in work as a result of experiencing a performance-based intervention. Principals that are faced with prospects of rewards or whom have received performance-based rewards, on the other hand, may be more enthusiastic about his or her job and demonstrate greater engagement.

According to the theory of action of accountability (O'Day & Smith, 1990), performance-based accountability will positively motivate and engage school leaders however this theory is challenged in this dissertation. Keeping with the research by O'Day (2002) discussed in the first section of this chapter, state policy for reward and intervention and exposure to reward and intervention are expected to have a negative relationship with principal work engagement.

Principal Supportive Leadership

Supportive leadership is leadership that focuses on the personal development of all individuals in an organization or school. Supportive leadership can be conceptualized as the extent to which leaders support subordinates' decisions, demonstrate concern for their welfare, and provide them with psychological support (House & Mitchell, 1974; House, 1996). In this dissertation, principal's supportive leadership was more specifically defined as the degree to which a principal's teachers believe the principal expresses emotional backing and support to the staff.

Supportive leadership has been integrated into theories of effective leadership in organizational environments (House, 1996; House & Mitchell, 1974) and school environments (Leithwood & Riehl, 2005; Leithwood et al., 2004; Leithwood & Jantzi, 2000; Leithwood, 2005; Jacobson, 2008). In models of effective school leadership (Jacobson, 2008; Leithwood & Riehl, 2005), principals' individualized support of teachers is an essential component of effective schools. In a review by Leithwood and Riehl (2005) that outlined four critical areas of effective leadership practices among school principals, the reviewers emphasized the principal's social support of individual teachers as one of the most critical components of effective leadership.

There is empirical evidence that supportive leadership is associated with positive school outcomes. Support from principals is associated with reduced teacher burnout (Kahn et al., 2006; Kim, Lee, & Kim, 2009; Weng, 2004). In a study of 339 teachers in the United States, perceptions of emotional social support were associated with all three dimensions of burnout: emotional exhaustion, cynicism, and sense of achievement. More specifically, as perceptions of emotional support increased, emotional exhaustion and cynicism decreased and sense of

achievement increased (Kahn et al., 2006). This finding is corroborated by research by Kim, Lee, and Kim (2009) who conducted a study on 202 elementary school teachers in Korea exploring the relationship between social support and burnout. Kim et al. (2009) defined burnout in terms of emotional exhaustion, cynicism, and lack of personal accomplishment and defined social support in terms of principal and vice principal support, colleague support and family support. The researchers reported that principal and vice principal support was related to teachers' lack of personal achievement such that as support increased, feelings of underachievement decreased, $r = -.16$, $p < .05$. The relationship between social support and teacher burnout is also documented in a meta-analytic dissertation study. Weng (2004) performed a meta-analysis on 35 studies on teacher burnout in elementary, middle, and high schools. Weng reported that support from the principal was associated with all three dimensions of burnout: emotional exhaustion ($k = 4$ studies, $r = -.24$), depersonalization ($k = 4$ studies, $r = -.15$), and personal accomplishment ($k = 4$ studies, $r = .18$).

There is empirical evidence of relationships between supportive leadership and outcomes such as teacher commitment, engagement, empowerment, and job satisfaction (Hulpia, Devos, & Van Keer, 2011; Hakanen, Bakker, & Schaufeli, 2006; Institute for Educational Leadership, 2008; Skaalvik & Skaalvik, 2009). In a study of 1,522 teachers from 46 secondary schools in Belgium, teachers' organizational commitment was associated with the quality and source of supportive supervisory leadership (Hulpia, Devos, & Van Keer, 2011). Support from the principal was associated with teachers' organizational commitment, $r = .229$, $p < .001$; in fact, support from the principal was more important than support from vice principals ($r = .103$, $p < .001$) and support from the teacher leader ($r = -.01$, $p > .05$).

In a study of teacher engagement, Hakanen, Bakker, and Schaufeli (2006) examined the relationships between job resources and teacher engagement among 2,038 Finnish teachers. The researchers reported that teacher's perceptions of supervisor support were related to four dimensions of engagement: vigor ($r = .21$, $p < .001$), dedication ($r = .22$, $p < .001$), emotional exhaustion ($r = -.16$, $p < .001$), and cynicism ($r = -.22$, $p < .001$).

The Institute for Educational Leadership [IEL] reported findings from a study of high school principals and teachers from 76 schools[1]. The report asserted that teachers who were in schools with socially supportive principals were more involved with different roles within the school and took on more responsibilities thought to be traditionally associated solely with school administrators (IEL, 2008). Qualitative findings included teacher comments such as "'teachers need to feel supported' and once they do, they are better able to address needs they see either within the system or with particular students" (p. 7). According to the IEL report (2008), support from principals is absolutely critical to teacher leadership and empowerment.

Support from principals has also been examined in relation to teacher satisfaction (Skaalvik & Skaalvik, 2009). In a study of 563 teachers from 28 schools in Norway, researchers examined the extent to which teachers felt cognitive and emotional support from school leadership in relation to other school context variables (time pressure, relations to parents, and autonomy), burnout (emotional exhaustion, depersonalization, and reduced personal accomplishment), and job satisfaction. Skaalvik and Skaalvik (2009) found that supervisor support was positively related to job satisfaction ($r = .29$, $p < .05$), relations with parents ($r = .11$, $p < .05$), and autonomy ($r = .37$, $p < .05$) and that supervisory support was negatively related to

[1] Initially 300 schools were identified but the study criteria reduced this to 76 schools; schools that did not meet AYP in 2-3 years were eliminated from the analysis

time pressure (r = -.23, p < .05), emotional exhaustion (r = -.29, p < .05), depersonalization (r = -.17, p < .05), and reduced personal accomplishment (r = -.23, p < .05).

Principal Supportive Leadership and School Accountability. The impact of reward and intervention policy on principal supportive leadership and the extent to which exposure to reward or intervention is related to principal supportive leadership are relationships that remain unexplored in the literature on school accountability. At this time, it is unknown how school accountability policy is associated with principal supportive leadership. As stated at the beginning of this chapter, the theory of action of accountability is being challenged in this dissertation; while the theory of action purports that a principal will act in ways that are conducive to organizational and academic success, performance-based accountability is expected to have a negative impact on principal behaviors.

Principal Shared Instructional Leadership

Shared leadership, or participative leadership, is the extent to which leaders share decision-making and encourage subordinates to participate in decision-making (House & Mitchell, 1974). Shared leadership is considered integral in healthy schools and in school climate reform (Hughes & Pickerall, 2013). According to Hughes & Pickerall (2013, p.2), "in order for safe, equitable, engaging, and high-quality school climates to become the norm in American schools, schools must encourage, support, and reward shared leadership."

Shared instructional leadership is when principals share instructional and curricular decision-making and influence with teachers. This type of leadership is a key component in models of effective school leadership (Leithwood & Reihl, 2005; Jacobson, 2008), where

principal-teacher collaborative processes, progressive organizational structures, and instructional excellence are strongly emphasized.

Specific styles of instructional leadership are outlined in the organizational leadership model developed by Jackson and Marriott (2012), a model that expanded on an organizational theory developed by Ogawa and Bossert (1995). The organizational leadership model includes four categories (e.g. low teacher influence and low principal influence; low teacher influence and high principal influence; high teacher influence and low principal influence; high teacher influence and high principal influence) related to the level of instructional influence held by the teachers and the principal. This dissertation focused specifically on leadership where principals and teachers both have high levels of instructional influence: shared instructional leadership.

Principals that exhibit shared instructional leadership styles are associated with optimal organizational environments (Jackson & Marriott, 2012), higher quality instruction (Marks & Printy, 203), and better school achievement (Marks & Printy, 2003). In a study of 7,950 schools, Jackson and Marriott (2012) reported that instructional decision-making shared among principals and teachers was related to higher principal satisfaction, $F(3,6970) = 58.85$, $p < .001$, and higher school performance, $F(3, 6970) = 22.53$, $p < .001$. Marks and Printy (2003) examined the leadership styles of principals from 24 schools undergoing reform and characterized schools by the degree to which principals exhibited a combination of shared instructional leadership and transformational leadership (or leadership characterized by mission-centered, performance-centered, and culture-centered leadership; see Leithwood & Jantzi., 2000). Marks and Printy (2003) reported that schools that demonstrated a combination of shared instructional leadership and transformational leadership were associated with higher classroom-level achievement on the

National Assessment of Educational Progress (NAEP), $\beta = .39$, $p < .001$, higher student-level achievement scores, $\beta = .56$, $p < .01$, and better pedagogical quality in classrooms, $\beta = .59$, $p < .05$.

Principal Shared Instructional Leadership and School Accountability. There has been some research conducted on the association between school accountability policy and components of shared instructional leadership. According to research, school accountability policy may impact the degree of influence that a school principal exerts over instruction. More specifically, state control over instruction and test-driven accountability may discourage shared instructional leadership. In a study exploring the effects of state control over instruction on principal leadership, Marks and Nance (2007) reported that principals exercised greater instructional influence in states where there was a high level of state control over curriculum and instructional standards. At the same time, teachers in high-control states reported significantly less instructional influence than teachers in low-control states (Marks & Nance, 2007). In another study on principal accountability for student achievement, Amo (2013) reported that principals in schools that were held accountable for students' performance on standardized tests exhibited significantly greater influence over instruction relative to principals who were not held accountable for students' performance on standardized tests.

Thus, the literature suggests that school accountability policies encourage principals to take tighter control over instructional matters in his or her school (Marks & Nance, 2007; Amo, 2013) and that greater degrees of school accountability for student achievement may be related to principal-centered instructional influence as opposed to shared instructional leadership. These findings challenge the theory of action of accountability (Figlio & Loeb, 2011; Smith & O'Day,

1990) and support O'Day's (2002) argument against it. Instead of motivating principals to share instructional influence and power with teachers, performance-based accountability seems to encourage school leaders to reign over teachers in terms of instructional decision-making. This dissertation hypothesizes that performance-based accountability is negatively related to the practice of shared instructional leadership.

School Accountability

State Policy for Performance-Based Reward and Intervention

After NCLB in 2002, states began introducing incentives (rewards and interventions) that were contingent on student achievement on standardized tests. According to Ahn and Vigdor (2013), a theoretical premise of school accountability policy is that administrators and teachers will naturally react to state policy for reward and intervention (sometimes referred to in terms of "sanctions"). In other words, principals and teachers do not necessarily have to experience rewards or interventions in order to feel pressure to react; their behaviors and attitudes may change simply due to policy being in place in a particular state and/or district. In terms of the theory of action of accountability (Smith & O'Day, 1990; Figlio & Ladd, 2007), the possibility of reward or intervention based on performance will motivate school leaders to behave in ways that are aligned with student achievement on standardized tests.

However, as articulated by researchers (Smith and O'Day 1990; O'Day, 2002), this would entail near perfect conditions in schools and assumes that school leaders and educators are well-informed about where to direct resources and effort to affect student achievement on standardized tests. In practice, external policy has little impact on teaching and learning (Elmore,

1996). As such, state policy for reward and state policy for intervention are hypothesized to be negatively related to principal behaviors in this dissertation (research question one).

Exposure to Performance-based Rewards

During the 2003-04 academic year, certain schools that met all performance goals in the previous academic year (i.e. 2002-03) were provided rewards. Rewards included monetary rewards for school-wide investment, monetary rewards for individual teachers, and non-monetary rewards (i.e. recognition). In this dissertation, exposure to overall rewards and to different types of rewards are examined in relation to principal behaviors (research question two).

The theory of action of accountability (Smith & O'Day, 1990; Figlio & Ladd, 2007) postulates that rewards will motivate school leaders towards practices that are associated with student achievement. However, existing research demonstrates that exposure to certain rewards may have detrimental effects on organizational outcomes. For example, research indicates educators are less comfortable with the idea of being compensated as a group because of the lack of individual influence on the results (Bretz & Judge, 1994; Kuhn & Yockey, 2003). Other research by Milanowski (2007) indicates that educators prefer individual pay-for-performance structures as opposed to school-based reward structures because compensation would be fairer, and less effective educators could not be rewarded for performance that is largely attributed to more effective educators, an issue known as the "free-rider" problem.

Principals may feel that external-based rewards are a threat because the rewards communicate that power and recognition lie beyond the school principal. Challenging the theory

of action of accountability (Smith & O'Day, 1990) in keeping with research by O'Day (2002), performance-based accountability in the form of exposure to performance-based rewards was hypothesized to be negatively associated with principal behaviors.

Exposure to Performance-based Intervention

In the 2003-04 academic year, certain schools that did not meet all performance goals in the previous academic year (2002-03) were subject to interventions designed to improve school and student performance. The relationship between these interventions and principal behavior is examined in research question three.

Performance-based school interventions are intended to support schools and bolster student performance, however these interventions are often interpreted as negative and undesirable. For example, the public tends to interpret interventions as indication that a school is inadequate or failing (Hess, 2006; Daly et al., 2011), and certain types of interventions put stress on administrators and teachers (Daly et al., 2011). Beyond being interpreted as negative and stressful, performance-based interventions for schools that have not met performance goals are often cited as being difficult to implement (Scott, 2008). This is particularly relevant for schools in the restructuring phase of intervention (under NCLB) where schools are required to implement interventions based on specific plans (Scott, 2008). There is evidence that some states provide assistance to schools undergoing such interventions (e.g. Michigan's Department of Education State School Reform/Redesign Office; State of Michigan, 2014), however there is also evidence that such assistance is insufficient in terms of technical support (Taylor et al., 2010). Circling back to the arguments against the theory of action of accountability (Smith & O'Day, 1990; O'Day, 2002), schools that experience interventions are being controlled by external forces and

this has been shown to have a negative impact on the internal organizational environment (O'Day, 2002).

For these reasons, performance-based interventions are hypothesized to be negatively associated with principal behavior. School principals experiencing public acknowledgement of school failure and subsequent intervention may demonstrate lower engagement and exhibit less effective leadership due to feelings of ineffectiveness and failure. Furthermore, the difficulty in implementing school-based interventions (Scott, 2008) may also be associated with less positive principal behavior; principals faced with failing schools coupled with lack of resources may feel completely defeated and exhibit less engagement and exert less effort in demonstrating effective leadership.

School Context, Performance-Based Accountability, and Principal Behavior

The relationships between performance-based accountability policies and principal behavior do not exist in a vacuum. School context makes a difference in how principals behave and interact with faculty and students (Horng, Klaski, & Loeb, 2009; Price, 2011), and may make a difference in how school accountability policy relates to principal behaviors. Research question four addressed this by taking into consideration school size and school poverty.

School Size

School size may make a difference in how accountability policy is related to principal behavior. Smaller schools tend to have climates that are more positive and conducive to learning (Horng, Klaski, & Loeb, 2009) and teachers in smaller schools tend to be more satisfied overall (Price, 2011). In smaller schools, a principal may have deeper relationships with faculty and

students and therefore feel more incentivized by rewards and/or interventions to lead the school and all of its members towards success. This may positively affect principal behaviors such as engagement and productive leadership practices. In larger schools, on the other hand, a principal may feel less connected to all faculty, staff, and students and therefore feel less obligated to the school to respond to external accountability policies behaviorally and emotionally. For example, there is evidence that school size is negatively related to sense of community and professional community in schools. Findings from Weathers (2011) showed that school size was negatively related to teachers' sense of community in a study of 3,327 teachers in 917 urban elementary schools. Research by Sebastian and Allensworth (2012) demonstrated that school size was negatively related to professional community $\beta = -.25$, $p < .01$ in sample of 3,529 teachers in 99 schools in the Chicago Public School district.

On the other hand, school size may affect the relationship between accountability policies and principal behaviors in a completely different way. For example, principals leading larger schools may recognize that a large number of persons are affected by his/her actions and reactions to accountability policy and therefore actually feel a greater sense of obligation to the school and district (and to all associated faculty, staff, and students). Leading a larger school may therefore encourage principals to react to accountability policy in a manner that is more positive.

Overall, the relationships between performance-based rewards and interventions and principal behavior may differ based on school size. However, there is not sufficient research in this area to guide a more informed hypothesis. With regard to school size, no directional hypotheses (i.e. that performance-based rewards will have a greater positive impact on principal behaviors in small schools) were posited in this dissertation.

School Poverty

School poverty may also make a difference in how accountability policy affects principal behavior. Principals leading high-poverty schools are qualitatively different from principals leading low-poverty schools; principals leading high-poverty schools tend to have less experience, be more transient, and have lower quality education relative to principals leading low-poverty schools (Rice, 2010); having less experience and preparation, principals of high-poverty schools may likewise be less organizationally savvy and tend not to exhibit positive organizational behavior particularly when placed under high-accountability conditions. Furthermore, the quality of relationships between principals and teachers tends to be lower in high-poverty schools (Price, 2011) and this may mean that principals of high-poverty schools are less inclined to react to accountability policy on behalf of faculty, staff, and students. However, school poverty may also affect principals in different ways. In terms of rewards, principals of high-poverty schools may be more incentivized by performance-based monetary rewards (relative to low-poverty schools) because of lower access to resources and this may impact principal engagement and leadership behavior.

In terms of performance-based interventions, principals leading high-poverty schools may react differently relative to principals of low-poverty schools. It may be that principals of high-poverty schools become disengaged and distant as a result of being targeted for intervention because he or she is not adequately equipped with the resources to make change happen and other school climate issues (i.e. teacher quality, student engagement, school safety) confound the problem. On the other hand, performance-based interventions may encourage a principal in a high-poverty school to demonstrate behavior that produces effective school change.

Overall, it is likely that school poverty will affect the relationships between accountability policy and principal organizational outcomes. However, there is little research on this and therefore no specific directional hypotheses (i.e. principals in high-poverty schools will have more negative organizational outcomes to performance-based interventions) were posited in this dissertation.

Summary of Literature and Hypotheses

Principal engagement, supportive leadership, and shared instructional leadership are integral components of effective schools and are associated with a multitude of positive outcomes (Federici & Skaalvik, 2011; Hughes & Pickeral, 2013; Jacobson, 2008; Bakker, Gierveld, and Van Rijkswijk, 2006; Beteille, Kalogrides, & Loeb, 2009; Rice, 2010). In response to school underperformance and ineffectiveness, different types of school accountability policies were designed to create and support more effective schools and to improve student achievement (Figlio & Loeb, 2011). However, because school accountability policies have been targeted at student achievement, the research in this area has focused largely on student achievement as outcomes (e.g. Ahn & Vigdor, 2013; Lee, Shin, & Amo, 2013; Lee & Reeves, 2011). The research on how principal behaviors are associated with accountability policy is significantly underdeveloped. The theory of action of accountability (Smith & O'Day, 1990; O'Day, 2002; Figlio & Ladd, 2007) posits that performance-based accountability, such as state policy for reward and intervention and exposure to incentives, will motivate principals to perform in ways that produce effective learning environments. However, existing research (O'Day, 2002; Amo, 2013) suggests that this theory does not hold. This dissertation study explicitly challenges the

theory of action of accountability and examines if school accountability policy has an adverse impact on principal engagement, supportive leadership, and shared instructional leadership.

The first set of hypotheses was related to research question one: Is state policy for reward and/or intervention associated with a principal (a) engagement, (b) supportive leadership, and/or (c) shared leadership over instruction? State policy for reward and state policy for intervention were hypothesized be negatively related to engagement, supportive leadership, and shared instructional leadership.

The second set of hypotheses was related to research question two: Is exposure to reward associated with principal behavior in schools meeting all performance goals? Based on work by O'Day (2002), exposure to any reward is hypothesized to be negatively associated with principal behavior. Among schools where all performance goals were met, principals in schools that received rewards are expected to be less engaged, less supportive, and demonstrate less shared instructional leadership relative to principals in schools that were not rewarded.

The third set of hypotheses was related to research question three: Is exposure to intervention associated with principal behavior in schools that failed to meet all performance goals? Again, based on work by O'Day (2002), exposure to intervention was hypothesized to be negatively associated with principal behavior. In other words, principals that received any type of performance-based intervention are hypothesized to exhibit less engagement, supportive leadership, and shared instructional leadership relative to principals in schools that failed to meet performance goals yet did not receive such interventions.

The fourth set of hypotheses was related to research question four: Does school poverty or school size interact with school accountability policy to impact principal behavior? The hypotheses for both school poverty and school size were that the relationships between school accountability (potential, reward type, and intervention type) and principal behaviors would vary across schools of different poverty levels and would vary across schools of different sizes. For both school poverty and school size, no directional hypotheses are posited.

CHAPTER THREE:

METHODS

This dissertation study was a secondary data analysis that examined performance-based accountability in relation to three principal behaviors using a nationally representative sample of public elementary schools from the Schools and Staffing Survey 2003-04 published through the National Center for Education Statistics (NCES). Three types of school accountability were examined in relation to the principal behaviors. This first type of school accountability was state policy for reward and/or intervention. The second type of school accountability was exposure to performance-based reward. The third type of school accountability was exposure to performance-based intervention.

The analysis of state policy for reward and/or intervention included all principals in the sample of public elementary schools. The analysis of exposure to reward was limited to principals in schools where all performance goals had been met in the previous academic year. The analysis of exposure to intervention was limited to principals in schools where all performance goals had not been met in the previous academic year. Principals were nested within states and all analyses were multilevel.

Research Questions

This dissertation was guided by four research questions (see Figure 1):

1. Does state policy for reward and/or intervention relate to principal behaviors?
2. Among schools meeting all performance goals in the previous academic year, does overall reward or type of reward relate to principal behaviors?
3. Among schools that failed to meet all performance goals in the previous academic year, does overall intervention or type of intervention relate to principal behaviors?
4. Are there interactions between school context and school accountability in relation to principal behaviors?

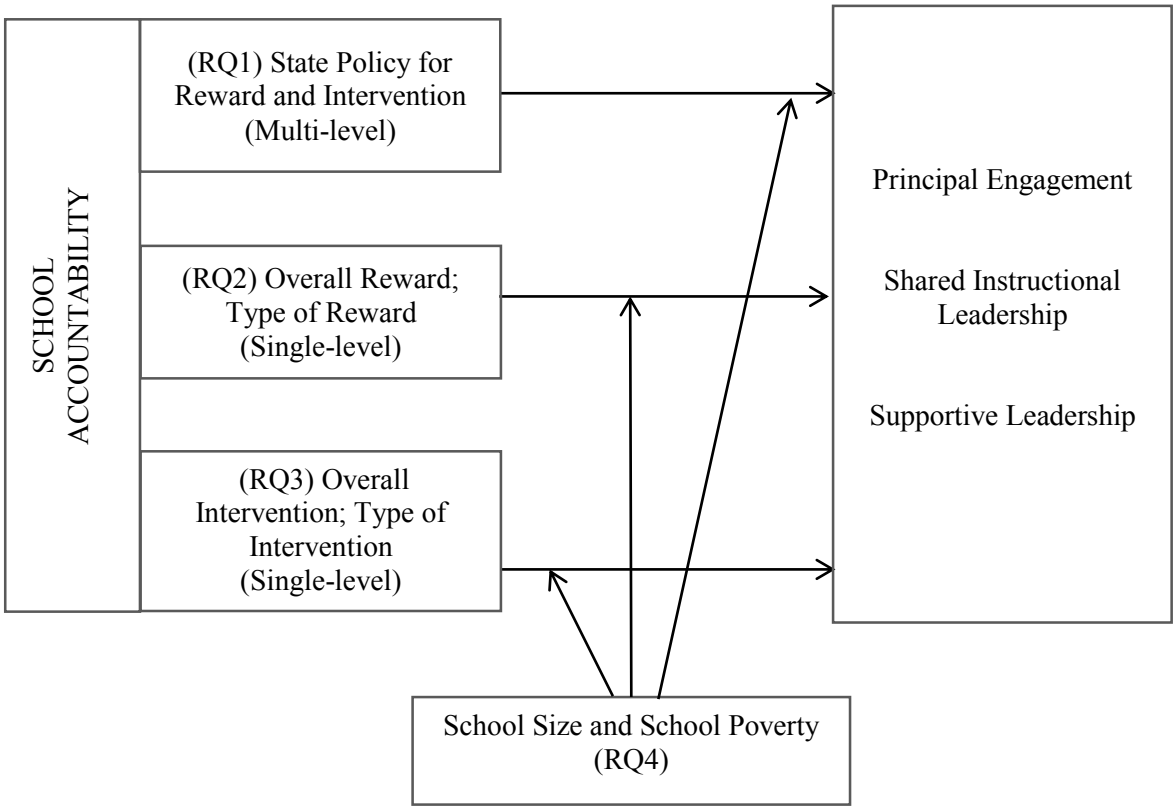

*Figure 1***.** Research Questions Guiding the Dissertation Study. The different types of school accountability are on the left and the principal behaviors are on the right.

Data

The restricted version of the Schools and Staffing Survey [SASS] (2003-2004) database provides information about the state, district, school, and teacher. The data have unique identifiers that allow for linkage across data sources (e.g. state to district, district to school). Data for the SASS are collected through the National Center for Education Statistics (NCES) and the SASS is one of the many studies that are continuously maintained through the NCES. Data are collected based on a multi-stage sampling method (NCES, 2006), and are representative of the nation's school-age population as of 2003-2004. The data in the 2003-04 SASS represent a sampling frame based on 2001 Census data (Common Core of Data).

Stratified Sampling. The data are stratified by state, school, and teacher. Districts are referred to as local education agencies or LEAs; information about the district is captured at the school level. In order to provide accurate representation of schools, the SASS sampling method for 2003-04 addressed five domains including (1) the nation, (2) elementary and secondary levels by public and private sectors, (3) schools with a student population with at least 20% American Indian or Alaska Native, (4) school levels of public schools by state, and (5) private schools by group of association, school level, and region.

In sampling teachers for the SASS, the schools were selected with probability that was proportionate to the square root of the number of teachers in the school. Within selected schools, teachers were sampled at a rate that remained constant within strata with at least one and no more than 20 teachers sampled per school (NCES, 2014).

Weighting. The weights used in the SASS have three different purposes (NCES, 2014). The first purpose is to account for the school's probability of selection in the sample. The second purpose is to reduce bias from non-response. The third purpose is to make use of available external data in order to improve the precision of estimates from the sample. The weights are intended to produce estimates representative of the nation, region, and state with regard public schools, districts, principals, teachers, and libraries in schools.

For the multilevel analyses, the final weight for principals was used to adjust for oversampling and non-response; the HLM software normalizes the weights to preserve effective sample size. For the correlation analyses, a normalized weight was computed such that $w_{Normalized} = \frac{1}{P_i} * \frac{n}{\sum W}$ where $\frac{1}{P_i}$ is the final sample weight provided in the database, n is the number in the respective sample, and $\sum W$ is the sum of the final sample weights.

Missing Values. The data from the NCES undergoes multiple imputation procedures to address missing values (NCES, 2014). There are five methods used to impute values including: (1) using data from other responses on the questionnaire, (2) extracting data from another related component of the instrument, (3) extracting data from the sampling frame for example, the Common Core of Data, (4) extracting data from a sample case with similar characteristics, and (5) clerically determining the response. This minimizes the occurrence of missing values, yet does not eliminate it completely. Missing values were deleted (list-wise) during analysis (see footnotes in the Results section).

Analytical Sample

The school accountability policies and practices that were studied in this dissertation are particularly relevant in public schools, as pointed out by Weathers (2011). Price (2012) discussed how existing research on secondary school leadership suggests that leadership may manifest at the level of the department instead of at the level of the principal (Bidwell, 2001), which could potentially confound the analysis of principal leadership patterns in secondary school settings. There is also more research on elementary school accountability (e.g. Weathers, 2011; Price, 2012; Jacobson, 2008) to which findings from this dissertation may be compared. For these reasons, this dissertation specifically focused on public elementary schools. As discussed above, there were three distinct samples that related to the first three research questions. The analytic sample for research question one included all principals in public elementary schools that reported having performance goals. The sample for research question two included principals in public elementary schools where all performance goals had been met in the previous academic

year. The sample for research h question three included principals in public elementary schools where all performance goals had not been met in the previous academic year.

Constructs and Variables

The variables described in this section correspond to the main constructs in this study, represented by the boxes shown in Figure 1. The reliability estimates of all composite measures were calculated using Cronbach's alpha (1951).

School accountability. Three dimensions of school accountability were examined: *state policy for reward and/or intervention, exposure to reward,* and *exposure to intervention*. *State policy for reward and/or intervention* was evaluated based on all schools in the analytical sample. *Exposure to reward* was evaluated based on all schools meeting the performance goals in the preceding year. *Exposure to intervention* was evaluated based on all schools not meeting performance goals in the preceding year.

State policy for reward and/or intervention. State policy for reward and/or intervention represented whether or not a state had policy for schools to receive rewards and/or interventions based on student test performance. While NCLB required that Title 1 schools impose interventions based on poor performance, only certain states imposed interventions on schools regardless of Title 1 status. This information was provided by the Editorial Projects in Education Research Center (2013), an online resource that provides information on state-level reward and intervention status since 1999. The information from 2002-03 was used in the analysis. The information is listed in Appendix E.

Exposure to Reward. Reward types include monetary reward for school-wide activities, monetary reward for teachers, and nonmonetary recognition; schools that received these rewards were compared to schools that also met performance goals in 2002-03 but did not receive any rewards. Both overall reward and individual types of rewards were examined. The principal questionnaire includes questions that address whether schools were rewarded based on student performance on standardized tests in the previous academic year, and addresses how such schools were rewarded (Questions 28 and 29).

Exposure to Intervention. Performance-based interventions include supplemental education services, school choice, school improvement, evaluation cycle, reduction in resources, school takeover; schools exposed to these interventions were compared to schools that also did not met performance goals in 2002-03 yet did not receive any interventions. Both overall intervention and individual types of intervention were examined. The principal questionnaire includes questions that address whether schools were exposed to intervention based on student performance on standardized tests in the previous academic year, and addresses the types of interventions received (Questions 28 and 30).

Principal Behaviors. Principal behaviors include work engagement, supportive leadership, and shared instructional leadership. In this dissertation, the construct of work engagement (Kahn, 1990; Chartered Institute of Personnel and Development, 2013) was adapted to define *principal engagement* as the principal's satisfaction with, commitment to, and involvement with work. Principal engagement was measured by a composite variable comprised of the following items: "The stress and disappointments involved in serving as a principal at this school aren't really worth it," "The faculty and staff at this school like being here; I would

describe them as a satisfied group," "I like the way things are run in this district," "If I could get a higher paying job, I'd leave education as soon as possible," "I think about transferring to another school," "I don't have as much enthusiasm now as I did when I began my career as a principal," and "I think about staying home from school because I am just too tired to go." Principals were asked to respond on a four-point scale such that 1 = "Strongly agree" and 4 = "Strongly Disagree;" the composite item was created such that higher values reflect higher levels of principal engagement.

An instrument that has been used for measuring employee engagement in organizational research is the Utrecht Worker Engagement Scale ([UWES] Schaufeli, Bakker, & Salanova, 2006). The 17-item UWES includes items that are all positively worded such as "When I get up in the morning, I feel like going to work" and "I am immersed in my work." Seven survey items related to employee engagement from the 2003-04 SASS Questionnaires are similar to the items of the UWES, yet five of the seven items on the SASS are negatively worded, for example, "I think about staying home from school because I'm just too tired to go" and "The stress and disappointments involved in serving as a principal in this school aren't really worth it." After an item analysis, two of the items on the principal engagement scale were dropped ("The faculty and staff at this school like being here; I would describe them as a satisfied group," and "I like the way things are run in this district,") because reliability significantly improved for the scale when these items were removed. Overall, the estimate of reliability for principal engagement for the five items was .710. All of the items were negatively worded, thus original scoring was retained. Conceptually, higher scores corresponded to lower levels of disengagement.

Principal supportive leadership was defined as the degree to which a principal's teachers believe the principal expresses emotional backing and support to the staff. This variable was measured by an composite variable corresponding to average teachers' response to the following four items: "The principal lets staff members know what is expected of them," "The school administration's behavior toward the staff is supportive and encouraging," "My principal enforces school rules for student conduct and backs me up when I need it," "The principal knows what kind of school he/she wants and has communicated it to the staff." Teacher responses ranged from 1 = "Strongly agree" to 4 = "Strongly disagree" and were reverse-scored such that high scores reflect higher perceived supportive leadership. Researchers in school accountability (see Weathers, 2011) have used these same items in earlier versions of the SASS[2]. The estimate of reliability for these four items measuring principal supportive leadership was .851, as estimated using Cronbach's alpha (1951). Based on an item analysis of the principal supportive leadership items, all of the items were retained in the scale because reliability was highest when all four items were considered.

Shared instructional leadership was defined as a type of leadership in which teachers believe that (s)he share instructional influence and control with the principal both at the school level and within the classroom. Teachers who feel that he/she are influential and have control over classroom instructional matters are in schools were instructional leadership is shared, based on the organizational leadership model (Jackson & Marriot, 2012).

The construct of shared instructional leadership was measured in terms of the degree to which decision-making over instruction was shared by the principal with teachers in the school.

[2] Weathers referred to this set of behaviors as leadership behaviors

This item was based on average teacher responses to five questions; two questions related to teacher influence over instructional policy in the school and three questions related to teacher influence over instructional matters in the classroom. The two questions related to teacher influence over school instructional policy were: "How much actual influence do you think teachers have over school policy in setting performance standards for students at this school?" and "How much actual influence do you think teachers have over school policy in establishing curriculum at this school?" The three questions related to teacher control over instruction in his/her classroom were: "How much actual control do you have in your classroom over selecting textbooks and other instructional materials?"; "How much actual control do you have in your classroom over selecting content, topics, and skills to be taught?" and "How much actual control do you have in your classroom in selecting teaching techniques?". For all of the items, responses ranged from 1 = *No influence*, and 4 = *Major influence*. Thus values of the composite variable ranged from 1 (*no influence*) – 4 (*major influence*). The estimate of reliability using Cronbach's alpha (1951) was .794.

Control Variables. A number of control variables were used in the analyses. Control variables related to the principal include years' experience as a principal (continuous), gender (dichotomous), and salary (continuous). These variables have been used in existing studies of principal behavior (see Leithwood, 2005) and school accountability (see Daly et al., 2011). Control variables at the school level included average daily attendance of the students, percentage of female teachers, percentage of White teachers, average years' experience teaching among teachers, percentage of teachers with Master's degree or higher, and percentage of teachers that were fully certified. These variables have been included as control variables in existing studies of principal leadership (see Weathers, 2011). Based on recommendations of the

committee, the number of vice principals was also included in all analyses. School size and percentage of students eligible for free or reduced price lunch were also included as control variables. Control variables at the state level included region of the country by U.S. Census classification, the average percentage of students eligible for free or reduced price lunch within the state, and the extent to which the state influenced the curriculum (the average within-state response of principals to the item).

School Context. To examine the contextual effect of school characteristics on these relationships, school size and poverty were included in the models. In the school questionnaire, respondents provide the enrollment for the schools and also provide the number of students who are eligible for free or reduced price lunch. School size was based on reported enrollment. The percentage of students eligible for free- or reduced-price lunch was used as a proxy for school poverty. The number of students eligible for free or reduced price lunch was divided by the total number of enrolled students, yielding the percentage. These variables served as control variables, and were used in the interaction terms with accountability variables to explore the effects on principal behavior.

Statistical Analysis

Descriptive statistics (e.g. means, standard deviations) are reported for all of the variables in the study. Across all of the public elementary schools in the sample[3], the correlation between principal engagement and shared instructional leadership was close to zero (-.022, $p > .05$), the correlation between principal engagement and supportive leadership was very small (.091, $p < .001$), and the correlation between shared instructional leadership and supportive leadership was

[3] The correlations were based on all principals, including those without performance goals ($n = 1950$)

also small (.211, $p < .001$). As such, the outcomes were estimated separately with the other principal variables included in the models as control variables. The other dependent variables were included as predictors because the constructs are theoretically different and occur simultaneously; this is consistent with organizational research that models behaviors such as job satisfaction and organizational commitment as reciprocally related (Mathieu, 1991; Saridakis, Muñoz, & Tracey, 2009). Supplemental analyses were conducted to ensure that estimates from other models where the other dependent variables were excluded as predictors were not significantly different than the ones presented from this analysis (see Appendix C).

Multilevel models were used to address all of the research questions. The research questions related to nested units (e.g. principals and schools nested within states) and were developed and tested in HLM version 7 software. Research question 1 (Does state policy for reward and/or intervention relate to principal behaviors) and 4A – D (Does school size or school poverty impact the relationship between state policy for reward and/or intervention and principal behaviors) included policy information at the state level. Research questions 2 (Is exposure to rewards associated with principal behavior?) and 3 (Is exposure to intervention associated with principal behavior?) were also evaluated in multilevel models, and the accountability information was captured at the level of the principal/school (level 1). The statistical plans for addressing each research question are outlined in the following section. Across all of the analyses, the log-likelihood estimates were recorded for each model and nested models were compared using $\chi 2$ difference test (Raudenbush & Bryk, 2002) in order to evaluate the most parsimonious model

with the best fit. [4]All of the analyses were weighted by the final principal weight provided by the SASS dataset.

Statistical Analysis Plan for Research Question One. Research question one (i.e. Does state policy for rewards and/or interventions relate to principal engagement, supportive leadership, and/or shared instructional leadership?) addressed the relationships between state-level policy for rewards and/or interventions and the three principal behaviors. This research question was addressed with a multilevel model with a policy indicator at level-2. Figure 2 provides a graphic display of the between-state analysis.

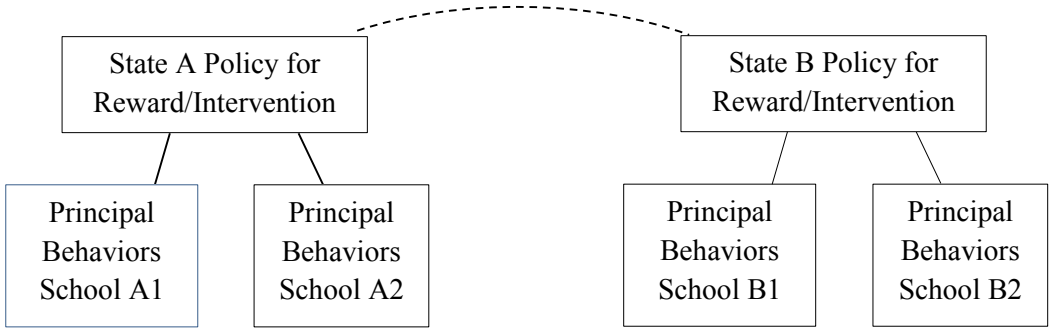

Figure 2. Research Question One. Multilevel investigation of state policy impact on principal behaviors among all public elementary schools that had performance goals

Analysis of this research question included all schools in the analytical sample, including schools that did and did not meet all performance goals in the previous year. In order to evaluate research question one, several statistical models were run. The procedures were similar across each analysis. First, a null model for each outcome estimated the variance between states in the three outcomes. The partially conditional model estimated the variance in principal outcomes

[4] The results from these tests are referred to as tests of incremental fit in the Results.

across states after controlling for covariates at each level. The fully conditional model included the same covariates, and also included the indicators for state reward and state intervention at level-2. Comparison of the partially conditional model and the fully conditional model revealed the relationship between state policy for reward and/or intervention on principal behaviors across all schools in the sample after controlling for principal, school, and state covariates. The χ^2 difference test evaluated the fully conditional model with the partially conditional model in terms of variance accounted for.

Statistical Analysis Plan for Research Question Two. Analysis of research question two (i.e. Is exposure to reward associated with principal behavior) included only schools that met performance goals in the prior year (n = 1030). Schools that were rewarded (n = 370) were compared with schools that were not rewarded (n = 660) in order to determine if there is an association with principal behavior. There were two types of relationships that were analyzed: (1) the association between overall reward and principal behaviors, and (2) the association between specific types of rewards and principal behaviors. See Figure 3 for a display of comparison groups.

Nested multilevel regression models were used to address this research question. The control variables (at both levels) were entered in the partially conditional model and the fully conditional model included the control variables in addition to dummy codes related to reward. The deviance statistics between the two models were compared via a χ^2 difference test in order to determine if the variance in the dependent variable was reduced by the addition of the reward variable. The fixed effects associated with reward were also evaluated.

As shown in Figure 3, there were separate models run to estimate the impact of overall reward (i.e. overall reward), and then individual dummy variables for the reward types (i.e. specific types of rewards) in order to determine the extent to which reward type explains variance in principal behaviors, above and beyond that explained by the control variables. The specific types of rewards that were modeled included (a) monetary reward for school-wide investment, (b) monetary reward for specific teachers, and (c) nonmonetary form of reward or recognition. Each was modeled separately (total of 12 regression models).

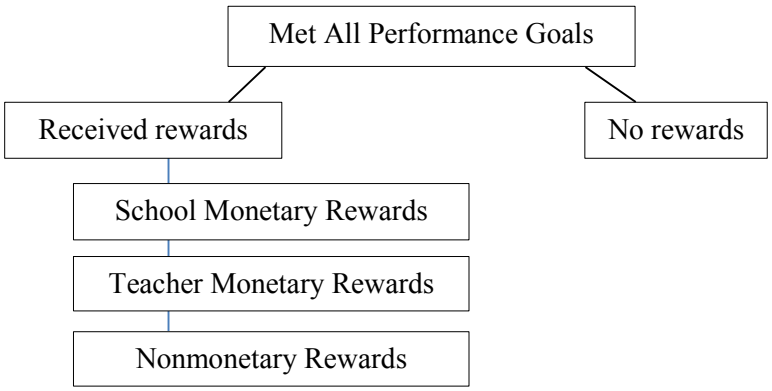

Figure 3. Research Question Two. Principals who received rewards are compared to principals who did not receive rewards, then specific forms of rewards are evaluated.

Statistical Analysis Plan for Research Question Three. Research question three (i.e. Does intervention or type of intervention relate to principal behaviors?) was addressed among schools where not all performance goals were met in the previous academic year. Principals in schools that received interventions (n = 490) were compared with principals in schools that did not receive interventions (n = 230). Again, there were two types of sub-questions addressed: (1) the association between overall intervention and principal behaviors, and (2) the association

between specific types of intervention and principal behaviors. See Figure 4 for a graphic display of comparison groups.

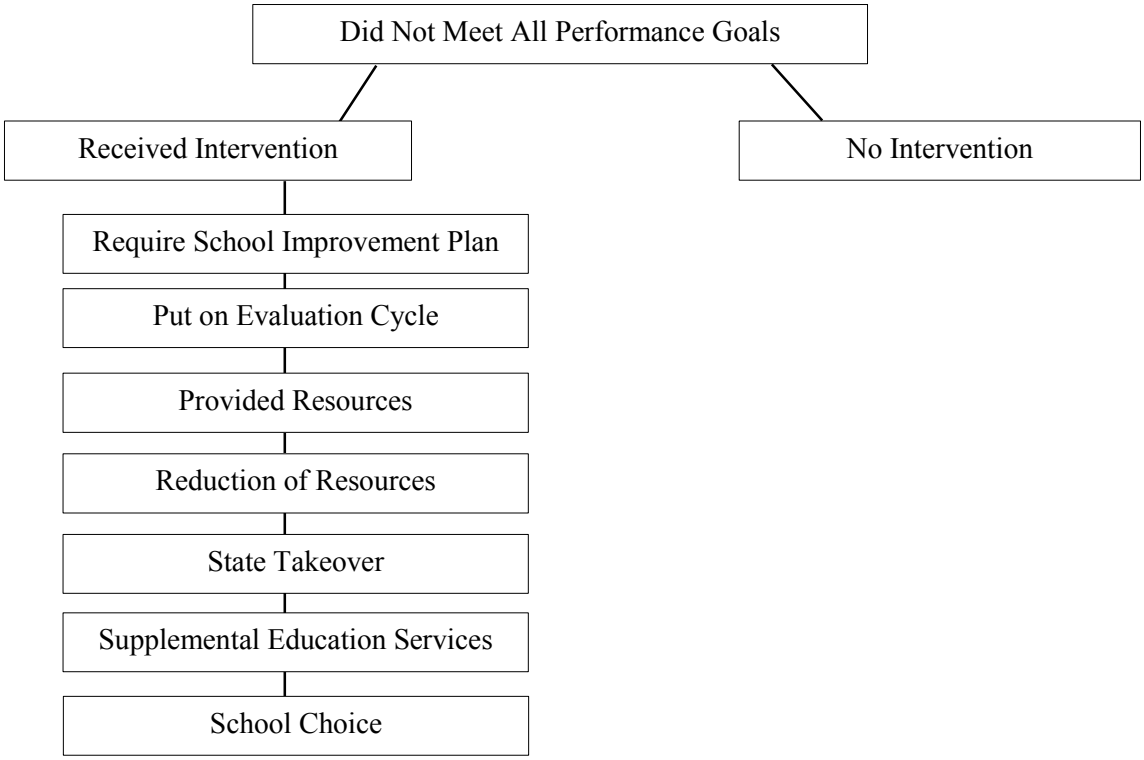

Figure 4. Research Question Three: Principals who received interventions are compared to principals who did not receive interventions, followed by evaluation of specific interventions.

The first regression model included the control variables and the second model included the control variables as well as the dummy code for the respective intervention; the deviance statistics were compared between the two using χ^2 difference test. There were eight models run where the intervention model was compared with the control variable model. The first model included a dummy variable indicating whether or not a school had experienced any intervention as a result of poor performance in the prior year (i.e. to evaluate the relationship between overall intervention and principal behavior). The subsequent seven statistical models included the

dummy variable for the respective interventions in the second model (i.e. to evaluate the relationship between specific types of intervention and principal behavior). The models were run for each of the three dependent variables (total of 24 multilevel regression models).

Statistical Analysis Plan for Research Question Four: School Size. Research questions 4A, 4C, 4E, and 4G (Is there an interaction between school size and school accountability in relation to principal behaviors?) were addressed with interaction terms. For questions 4A (Is there an interaction between school size and state policy for reward in relation to principal behaviors?) and 4C (Is there an interaction between school size and state policy for intervention in relation to principal behaviors?), the state-level reward and intervention variables were added to the equation predicting the slope for school size. As discussed by Raudenbush and Bryk (2002) and Hofmann and Gavin (1998), cross-level interaction models should be developed using group-mean centering at level-1 and a corresponding aggregate measure on level-2 intercept in order to provide an unbiased estimate. Thus, for these research questions, school size was group-mean centered at level-1 and a state level school size mean was included at level-2 to account for the between-state variation in school size.

For questions 4E (Is there an interaction between school size and exposure to reward in relation to principal behaviors?) and 4G (Is there an interaction between school size and exposure to intervention in relation to principal behaviors?), interaction terms were created in SPSS before converting data into the multivariate data matrix. Interaction terms were mean-centered to address multicollinearity (Aiken & West, 1991). Interaction terms were created with each type of reward and each type of intervention. Specifically, the interactions related to exposure to rewards included: size X monetary reward for schools; size X monetary reward for

teachers; and size X nonmonetary reward. Interaction terms related to exposure to intervention included size X supplemental education services; size X school choice; size X school improvement plan; size X evaluation cycle; size X reduced resources; and size X school take-over. Interaction terms were entered one at a time in separate models yet appear in the same table as the main effects; the statistical tables are annotated with a reminder. There were nine interaction models in relation to reward exposure (i.e. three types of reward with three dependent variables), and twenty-one interaction models for exposure to intervention (i.e. seven interventions with three dependent variables).

Each of the interaction terms were evaluated in separate models, and the interaction models were compared to the model with the main effect using a χ^2 difference test. For example, the model with all of the control variables and the indicator for monetary school reward was compared with the model with the control variables, the indicator for monetary school reward, and the interaction between school size and monetary school reward. There were three interaction models for state policy, nine interaction models in relation to reward exposure, and twenty-one interaction models in relation to intervention for a total of 33 separate statistical models relating to this research question.

Statistical Analysis Plan for Research Question Four: School Poverty. Research questions 4B, 4D, 4F, and 4H (Is there an interaction between school poverty and school accountability in relation to principal behaviors?) were addressed with interaction terms. The variable used as a proxy for school poverty was the percentage of students eligible for free or reduced price lunch. For questions 4B (Is there an interaction between school poverty and state policy for reward in relation to principal behaviors?) and 4D (Is there an interaction between

school poverty and state policy for intervention in relation to principal behaviors?), the state-level reward and intervention variables were entered into the equation predicting the slope for school poverty. Again, Raudenbush and Bryk (2002) and Hofmann and Gavin (1998) recommend group-mean centering at level-1 and aggregate measure on level-2 intercept. Thus, for these research questions, school poverty was group-mean centered at level-1 and a state level school poverty mean was included at level-2 to account for the between-state variation in school size.

For questions 4F and 4H, interaction terms were created in SPSS and were mean-centered to address multicollinearity (Aiken & West, 1991). Interaction terms for exposure to reward included: poverty X monetary reward for schools; poverty X monetary reward for teachers; and poverty X nonmonetary reward. Interaction terms related to intervention type included: poverty X supplemental education services; poverty X school choice; poverty X school improvement plan; poverty X evaluation cycle; poverty X reduced resources; and poverty X school reconstitution or take-over. The same nested model approach described in the above section was used. There were three interaction models for state policy, nine interaction models in relation to reward exposure, and twenty-one interaction models in relation to intervention for a total of 33 separate statistical models relating to this research question. The statistical tables are annotated with reminders.

CHAPTER FOUR:

RESULTS

Each of the outcome variables was examined for normality. The three outcomes were normally distributed (see Appendix B for Q-Q plots).

Descriptive Statistics

There were 1,950 principals of public elementary schools across 50 states in the overall sample. Of these principals, 94.3% (n = 1,840) reported that the state and/or district had school performance goals; among these principals, 1,730 reported that the school was evaluated based on the performance standards. Among these 1,730 schools, 1,030 passed all district and state performance standards in the previous year, 430 passed most district and state performance standards, 250 were in schools that passed some district and state performance standards, and 20 principals were in schools where no district and/or state performance standards were passed.

Research questions that related to state policy for reward and/or intervention (i.e. research questions 1, 4A, 4B, 4C, and 4D) were addressed based on the 1,730 principals who reported that the school was evaluated based on performance goals. Research questions that related to exposure to reward (i.e. research questions 2, 4E, and 4F) were evaluated based on the 1,030 principals in schools that passed all district and state performance standards in the previous academic year. Research questions that related to exposure to intervention (i.e. research questions 3, 4G, and 4H) were addressed based on the principals in the 700 schools that did not pass all of the performance standards in the previous academic year. Descriptive statistics related

to each of the samples are provided in Tables 1, 5, and 9. Correlation matrices related to the different samples are provided in Appendix D (Table D1, D2, and D3).

Research Question 1: State Policy for Reward and/or Intervention and Principal Behavior

For addressing research question one, principals in 1,720 schools across 50 states were included in the analysis[5]. These were principals in schools where performance goals were used to evaluate schools. Descriptive information on this sample is located in Table 1. The data show that the majority of principals in the sample were female (61%), had about 8.5 years of experience, and had an average salary of $72,233. On average, principals were in schools with an average of 88% female teachers, 88% White teachers, 44% Master's teachers, and 91% fully certified teachers. The principals were fairly equitably distributed across the country: 18% were from the Northeast, 24% were from the Midwest, 32% were from the South, and 26% were from the West. In terms of accountability policy, 42% of principals were in states that had reward policy and 20% of principals were in states with intervention policy.

Correlations

Looking first at the correlations (see Tables 2A – 2D), the three principal behaviors were related to certain control variables. Only key correlations (i.e. statistically significant correlations, correlations with context variables, and correlations with accountability variables)[6] are provided. As shown in Table 2A, principal engagement was not correlated with many control variables. Principal engagement was positively correlated with percentage White teachers (r = .059, $p < .05$), salary (r = .104, $p < .01$), and region of the U.S. (Northeast r = .131, $p < .01$);

[5] 10 schools were dropped at run-time deletion due to missing values.
[6] This term is used throughout the Results section.

principal engagement was negatively correlated with school poverty (r = -.094, p < .01). School size was not significantly correlated to principal engagement. Table 2B shows that supportive leadership was also not correlated with many control variables. Similar to principal engagement, supportive leadership was positively correlated with percentage White teachers (r = .109, p < .01) and was negatively correlated with school poverty (r = -.132, p < .01), and was uncorrelated with school size. Supportive leadership was also positively correlated with percentage certified teachers (r = .079, p < .01), and experience (r = .068, p < .01).

Table 1.
Descriptive Statistics on Overall Sample

	VARIABLE NAME	N	MINIMUM	MAXIMUM	MEAN	SD
Level 1	Shared Instructional Leadership	1690	1.3	4	2.84	0.43
	%Female teachers	1690	0	1	0.88	0.18
	%White teachers	1690	0	1	0.88	0.24
	%Master's teachers	1690	0	1	0.44	0.32
	%Fully certified teachers	1690	0	1	0.91	0.17
	Supportive Leadership	1690	1.5	4	3.46	0.42
	Experience	1720	0	41	8.53	7.47
	Salary	1720	23000	124610	72233.21	14815.37
	Vice Principals	1720	0	4	0.31	0.53
	Female	1720	0	1	0.61	0.49
	Hours per week spent with students	1720	1	100	21.07	12.11
	School Size	1720	23	3023	458.75	232.04
	Average Daily Attendance	1720	0	100	92.87	14.47
	Principal Engagement	1720	1	4	3.34	0.59
	School Poverty	1720	0	1	0.45	0.28
Level 2	Northeast	50	0	1	0.18	0.39
	Midwest	50	0	1	0.24	0.43
	South	50	0	1	0.32	0.47
	West	50	0	1	0.26	0.44
	Reward Policy	50	0	1	0.42	0.5
	Intervention Policy	50	0	1	0.2	0.4
	Average school poverty	50	0.22	0.8	0.44	0.13
	Average state influence over instruction	50	6.51	7.89	7.24	0.39
	Average school size	50	187.37	680.58	417.18	110.06

Table 2A.
Key Correlations between Control Variables and Principal Engagement among Principals with Performance Goals

	Principal Engagement
%White teachers	.059*
Salary	.104**
Northeast	.131**
School size	-.014
School poverty	-.094**

Note: *$p < .05$, ** $p < .01$

Table 2B.
Key Correlations between Control Variables and Supportive Leadership among Principals with Performance Goals

	Supportive Leadership
%White teachers	.109**
% certified teachers	.09**
Experience	.068**
School size	-.007
School poverty	-.132**

Note: * $p < .05$, ** $p < .01$

Relative to the dependent variables principal engagement and supportive leadership, shared instructional leadership was correlated with more control variables (Table 2C). This dependent variable was positively correlated with percentage of White teachers ($r = .081$, $p < .01$), experience ($r = .05$, $p < .05$), Midwest region of the U.S. ($r = .102$, $p < .01$). Shared instructional leadership was negatively correlated with female principal ($r = -.056$, $p < .01$), number of vice principals ($r = -.14$, $p < .01$), salary ($r = -.190$, $p < .01$), weekly hours spent in contact with students ($r = -.054$, $p < .05$), school size ($r = -.172$, $p < .01$), school poverty ($r = -.118$, $p < .01$), and Western region of the U.S. ($r = -.113$, $p < .01$)

There were significant correlations between principal engagement and supportive leadership ($r = .082$, $p < .01$), and shared instructional leadership and supportive leadership ($r =$

.253, $p < .01$). As shown in Table 2D, the principal behaviors were also correlated with the accountability policy. Principal engagement was significantly negatively correlated with state intervention policy ($r = -.114$, $p < .01$) and was also negatively related to state reward policy ($r = -.023$, $p > .05$) although the relationship was not significant. Shared instructional leadership was negatively related to state reward policy ($r = -.152$, $p < .01$) and to state intervention policy ($r = -.287$, $p < .01$); both of the negative associations were statistically significant. Supportive leadership was negatively correlated with state reward policy ($r = -.032$, $p > .05$) and state intervention policy ($r = -.063$, $p > .05$), although the relationship between state reward policy and supportive leadership was not statistically significant.

Table 2C.
Key Correlations between Control Variables and Shared Instructional Leadership among Principals with Performance Goals

	Shared Instructional Leadership
% White teachers	.081**
Female principal	-.056*
Experience	.05*
Midwest	.102*
West	-.113*
# Vice Principals	-.14**
Salary	-.19**
Weekly student contact hours	-.054**
School size	-.172**
School poverty	-.118**

Note: *$p < .05$, ** $p < .01$

Table 2D.
Correlations between State Accountability Policy and Principal Behaviors among Principals with Performance Goals

	PE	SL	SIL
State policy for reward	-.023	-.032	-.152**
State policy for intervention	-.114**	-.063*	-.287**

Note: *$p < .05$, ** $p < .01$

Based on the correlation analyses, further investigation of the relationships between state policy and principal behavior was warranted. The correlation results confirm that certain covariates need to be statistically controlled and that the key covariates differ by dependent variable. After controlling for the different covariates, the negative relationships between state policy for reward and/or intervention may change. Furthermore, the correlations related to school poverty confirm that the context of poverty deserves further examination with all three dependent variables and school size should also be explored because of the relationship with shared instructional leadership.

Results from Multilevel Regression

Results from fully unconditional models showed that principal behavior significantly varied across states. The intercept term in the final estimation of variance components was statistically significant for each of the dependent variables: principal engagement χ^2 (50, 1690) = 89.19, $p < .001$; supportive leadership χ^2 (50, 1690) = 78.73, $p < .01$; shared instructional leadership χ^2 (50, 1690) = 227.55, $p < .001$. The intra-class correlations ($\tau_{00}/\tau_{00} + \sigma^2$) for the null models showed that 2% of the variance in principal engagement, 1.7% of the variance in supportive leadership, and 9% of the variance in shared instructional leadership was at the state level.

The control variables at level-1 and level-2 were included in subsequent partially conditional models. Results indicated that the control variables accounted for the majority of the variance in the dependent variables. For principal engagement, there was no residual variance after the control variables had been accounted for χ^2 (50, 1690) = 45.814, $p > .05$. For supportive leadership, there was still significant variance beyond that accounted for by the control variables,

χ^2 (50, 1690) = 66.9, $p < .05$. For shared instructional leadership, χ^2 (50, 1690) = 154.54, $p < .001$.

In order to determine whether indicators for state reward and intervention policy helped explain variance in the dependent variables, tests of incremental model fit were run and were evaluated alongside the fixed effects in the fully conditional models (Table 3). Results from the fully conditional models were compared to results from the partially conditional model in order to determine if the state policy variables accounted for variance in the dependent variables, above and beyond that explained by the control variables. Results from χ^2 difference test are presented in Table 3.

Table 3.
Incremental Model Fit: State Policy

	Principal Engagement		Supportive Leadership		Shared Instructional Leadership	
	χ^2	*p*-value	χ^2	*p*-value	χ^2	*p*-value
State policy for reward and/or intervention	6.482	.038	5.523	.061	3.569	.166
State policy for reward and/or intervention x Size	4.110	.126	2.754	.251	1.986	>.500
State policy for reward and/or intervention x Poverty	7.364	.024	0.069	>.500	1.234	>.500

Results from the fully conditional models are presented in Table 4. Results in the table demonstrate that state policy for rewards was associated with only one of the principal behaviors. There was a relationship between state policy for reward and principal supportive leadership; principals in states that would potentially reward schools based on good student performance

Table 4.
Multilevel Regression: State Policy for Rewards and Interventions

	Principal Engagement		Principal Supportive Leadership		Shared Instructional Leadership	
	β	SE	β	SE	β	SE
Level-1						
%Female teachers	.1770	.17	.0177	.17	-.184	.18
%White teachers	.2263	.21	.4268**	.15	-.2382	.16
%Master's	.01	.21	.0823	.12	.1211	.09
%Fully certified	-.1756	.15	.4248*	.17	-.1751	.18
%Daily attendance	.0022	.00	-.0003	.00	.0017	.00
Hours/week spent with students	.0038	.00	.0058*	.00	-.0047**	.00
Vice Principals	.1247	.08	.006	.06	-.0728	.07
Experience	.0017	.00	-.009*	.00	.0127***	.2
Salary (x1000)	.006*	.00	.006**	.00	-.001***	.00
Female	.0618	.06	.037	.07	-.0092	.05
School size	-.0003	.00	.0000	.00	-.0003*	.00
School poverty	-.171	.14	-.3393**	.04	-.3355**	13
Principal engagement	---	--	.0665*	.03	.001	.02
Principal supportive leadership	.0695*	.03	---	--	.2568***	.03
Shared instructional leadership	-.0009	.02	.266***	.04	---	--
Level-2						
Intercept	0.1134*	.03	.1635*	.07	-0.01	.10
State influence over instruction	.1306	.05	.26**	.07	-.45***	.15
Northeast	.1708*	.05	-.3268	.18	.180	.17
Midwest	-.06	.04	-.2053**	.07	.0364	.12
South	-.0113	.05	.0274	.09	.1016	.07
State-level reward	-.0977	.03	-.14*	.06	.0328	.10
State-level intervention	-.1306*	.03	-.0515	.07	-.225	.16
*Size slope	-.0005	.00	-.0002	.00	-.0003	.00
State-level reward	.0005	.00	.0005	.00	-.0003	.00
State-level intervention	-.0002	.00	.0000	.00	.0005	.00
*Poverty slope	-.0215	.11	-.3028	.13	-.285	.19
State-level reward	-.4241*	.16	-.0492	.19	-.2134	.27
State-level intervention	.4303*	.21	.0122	.22	.1757	.23

NOTE: *Size and poverty slope results shown in the table are from separate models with state reward and intervention as predictors of the size slope and the poverty slope. The models included the same predictors at level 1 shown in the table. Findings from a total of 12 regression models are represented in the table. *$p < .05$, ** $p < .01$, *** $p < .001$

(regardless of school Title 1 status) were significantly less supportive of teachers, β = -.14, p < .05. There was no relationship between state policy for reward and principal engagement, β = -.0977, p > .05. There was no relationship between state policy for reward and shared instructional leadership, β = .0328, p >.05.

State policy for intervention was also associated with one of the principal behaviors. State policy for intervention was associated with significantly lower principal engagement, β = -.1306, p < .05. Specifically, principals in states where schools could be targeted for intervention had significantly lower engagement relative to principals in states where performance-based intervention was not a possibility. In terms of supportive leadership, principals in states with the potential for intervention were not any less supportive of teachers relative to principals in states without such potential for intervention, β = -.0515, p >.05. Similarly, there was no relationship between state policy for intervention and shared instructional leadership; principals in states where intervention was possible were not significantly less likely to share instructional leadership with teachers, β = -.225, p > .05.

Research Question 2: Exposure to Reward and Principal Behavior

For this analysis, there were 1000[7] principals in 50 states that met all of the performance goals in the previous academic year, 2002-03. Table 5 provides descriptive statistics on the principals and respective schools. Most the principals were female (58%), had about 9 years of experience as a principal, and earned about $73,000. On average, these principals worked in schools that were medium sized (about 460 students) and in schools that had high percentages of average daily attendance (about 93%), female teachers (88%), White teachers (91%),and fully

[7] 30 schools were dropped due to missing values

certified teachers (92%). Principals were in schools with an average of 460 students and where about 38% of the students were eligible for free or reduced price lunch.

Table 5.
Descriptive Statistics on Sample of Principals Meeting All Performance Goals

	N	Minimum	Maximum	Mean	SD
State Poverty	1030	.22	.80	.4484	.12371
State influence over instruction	1030	2.00	9.00	7.2364	1.11184
Northwest	1030	0	1	.1229	.328
Midwest	1030	0	1	.2283	.4199
South	1030	0	1	.3307	.4707
West	1030	0	1	.3180	.4660
% Female teachers	1010	0	1	.8856	.17153
% White teachers	1010	0	1	.9052	.21148
% Teachers with Master's degrees	1010	0	1	.4465	.32389
% Fully Certified teachers	1010	0	1	.9219	.16179
School Poverty	1030	0	1	.3872	.26010
Average daily attendance	1030	1	100	92.73	15.596
School size	1030	23	3023	461.09	240.150
Number of vice principals	1030	0	3	.29	.520
Female	1030	0	1	.5827	.49336
Years' experience as a principal	1030	0	37	8.91	7.579
Salary	1030	27000	124610	73220.24	14899.756
Hours per week spent with students	1030	1	70	20.59	11.48
Principal Engagement	1030	1.20	4.00	3.3621	.58644
Supportive Leadership	1000	1.83	4.00	3.4899	.40863
Shared Instructional Leadership	1010	1.33	4.00	2.8759	.41149
Monetary School	1030	0	1	.1167	.32126
Monetary Teacher	1030	0	1	.1138	.31774
Nonmonetary	1030	0	1	.2928	.45527
Overall Reward	1030	0	1	.3609	.48049

About 36% (N = 360) of the principals in this analysis were in schools that were rewarded in the previous academic year as a result of good student performance on standardized tests. 120 principals were in schools that received monetary funds for the entire school as a result of good performance, 120 were in schools that received monetary funds for teachers as a result of good performance, and 300 were in schools that received nonmonetary recognition as a result of good performance. There were 80 principals in schools that received monetary forms of recognition for both the school and the teachers; there were 50 principals in schools that received both monetary and nonmonetary forms of recognition.

Correlations

The full correlation matrix for research question two is provided in Table D2 in Appendix D. Key correlations are summarized in Tables 6A-6D. As in the analysis for Research Question 1 related to state policy, shared instructional leadership was correlated to more control variables relative to principal engagement and supportive leadership.

Table 6A.
Key Correlations between Control variables and Principal Engagement among Schools that Met All Performance Goals

	Principal Engagement
Northeast	.16**
West	-.065*
Salary	.134**
%White teachers	.07*
%Master's teachers	.072*
School size	.012
School poverty	-.106*

Note: *$p < .05$, ** $p < .01$

As shown in Table 6A, principal engagement was correlated with Northeast region of the US (r = .16, $p < .01$), Western region of the U.S. (r = -.065, $p < .01$), percentage White teachers

($r = .07$, $p < .05$), percentage Master's teachers ($r = .072$, $p < .05$), salary ($r = .134$, $p < .01$), school poverty ($r = -.106$, $p < .05$). School size was uncorrelated with principal engagement. Supportive leadership was correlated with only one control variables. As shown in Table 6B, supportive leadership was correlated with % White teachers ($r = .153$, $p < .01$) and school poverty ($r = -.134$, $p < .01$), yet was unrelated to school size.

Table 6B.
Key Correlations between Control variables and Supportive Leadership among Schools that Met All Performance Goals

	Supportive Leadership
% White teachers	.153**
School size	-.036
School poverty	-.134**

Note: *$p < .05$, ** $p < .01$

Shared instructional leadership was significantly correlated with Western region of the U.S. ($r = -.103$, $p < .05$), Midwest region of the U.S. ($r = .105$, $p < .05$), % White teachers ($r = .094$, $p < .05$), # vice principals ($r = -.103$, $p < .01$), salary ($r = -.219$, $p < .01$), and school size ($r = -.163$, $p < .01$).

Table 6C.
Key Correlations between Control Variables and Shared Instructional Leadership among Schools that Met All Performance Goals

	Shared Instructional Leadership
West	-.103*
Midwest	.105**
% White teachers	.094*
# Vice principals	-.103**
Salary	-.219**
School size	-.163**
School poverty	-.056

Note: *$p < .05$, ** $p < .01$

Two of the principal behaviors were correlated with reward as well (see Table 6D). Principal engagement was significantly correlated with school monetary reward ($r = -.11$, $p <$

.01) and teacher monetary reward ($r = .081$, $p < .01$) but not to nonmonetary reward. Supportive leadership was significantly correlated with overall reward monetary reward ($r = .07$, $p < .05$). Shared instructional leadership was not significantly correlated with any reward.

Table 6D.
Correlations between Exposure to Rewards and Principal Behaviors among Schools that Met All Performance Goals

	PE	SL	SIL
Overall	-.024	.07*	-.018
Monetary School	-.110**	.05	-.053
Monetary Teacher	-.081**	.026	.016
Nonmonetary	.005	.039	-.008

Note: *$p < .05$, ** $p < .01$

Based on the results from the correlation analysis for research question two, further investigation of the relationships between exposure to reward and principal behaviors was warranted. Different covariates were related to the three principal behaviors, sometimes in different ways. For example, principal salary was positively correlated to principal engagement yet negatively associated with shared instructional leadership. The correlation analyses demonstrated that certain rewards were correlated with the principal behaviors, and these relationships may change after the different covariates are statistically controlled for. The correlations also support the investigation of school context, as school poverty was correlated with two of the principal behaviors, and school size was correlated with shared instructional leadership.

Results from Multilevel Regression

In this section, results from χ^2 difference tests are presented along with results of the fixed effects for the overall reward models and the fixed effects for the three specific reward

models. Based on the test of χ^2 difference (see Table 7), overall rewards explained significant variation in supportive leadership, $\chi^2 = 4.924$, $p <. 05$ but not in principal engagement, $\chi^2 = .143$, $p >. 05$ or in shared instructional leadership, $\chi^2 = .0135$, $p >. 05$. As shown in Table 8, overall reward was positively related to principal engagement ($\beta = .0264$, $p >.05$) and principal supportive leadership ($\beta = .1497$, $p >.05$) and was negatively related to shared instructional leadership ($\beta = -.008$, $p >.05$). However, none of the fixed effects were significant.

Table 7.
Incremental Model Fit: Exposure to Reward

	Principal Engagement		Supportive Leadership		Shared Instructional Leadership	
	χ^2	*p*-value	χ^2	*p*-value	χ^2	*p*-value
Overall reward	.143	> .5	4.924	.025	.0135	> .500
Monetary School	10.988	.001	7.089	.008	5.0518	.023
Monetary Teacher	4.735	.028	.007	> .50	1.924	.162
Nonmonetary	1.189	.275	1.359	.242	.1829	>.500
Monetary School x Size	3.389	.062	2.716	.112	2.608	.102
Monetary Teacher x Size	.0013	> .5	.0057	>.500	.4423	>.500
Nonmonetary x Size	2.4687	.112	.0000	>.500	.006	>.500
Monetary School x Poverty	1.9117	.163	.0058	>.500	.1363	>.500
Monetary Teacher x Poverty	1.2618	.260	.2807	>.500	.3038	>.500
Nonmonetary x Poverty	3.9717	.043	.6654	>.500	.1323	>.500

In terms of the relationships between specific types of rewards and the three principal behaviors, the direction and magnitude of the relationships varied. In terms of monetary school-wide rewards, results from the χ^2 difference tests demonstrated that statistical models with this predictor fit the data significantly better than models with only control variables. As shown in Table 7, models with monetary school-wide reward had significantly lower deviance statistics for principal engagement $\chi^2 = 10.988$, $p < .001$, supportive leadership, $\chi^2 = 7.089$, $p < .01$ and shared instructional leadership, $\chi^2 = 5.0518$, $p < .05$. The fixed effect for school-wide monetary reward was statistically significant for principal engagement, $\beta = -.326$, $p < .001$; principals in

schools that received monetary school-wide rewards in the previous academic year demonstrated engagement that was .3σ lower than principals in schools that had not received such rewards. The fixed effect for school-wide monetary reward was not statistically significant for supportive leadership (β = .2864, p >.05) or shared instructional leadership (β = -.2497, p >.05). These results are consistent with the results from the correlation analysis and demonstrate that the negative relationship between school-wide monetary reward and principal engagement persists after accounting for the various control variables and for school context.

Monetary rewards distributed to individual teachers were generally unrelated to the three principal behaviors. The tests of χ^2 difference demonstrated that for the principal engagement model, the statistical model with this predictor fit the data significantly better than the model with only control variables, $\chi^2 = 4.735$, $p < .05$ (Table 7). However, the fixed effect associated with monetary reward for teachers was not statistically significant in the model predicting principal engagement, β = -.2131, $p > .05$ (Table 8). Relating this back to the results from the correlation analysis, it appears that the significant negative relationship between teacher monetary reward and principal engagement was minimized after accounting for the control variables in the multilevel regression models. As shown in Table 7, the nested model that included the predictor for monetary rewards for teachers was not associated with significantly lower deviance for supportive leadership ($\chi^2 = .007$, p >.05) or for shared instructional leadership ($\chi^2 = 1.924$, p >.05). Likewise, the fixed effect associated with monetary teacher rewards was not significant in the supportive leadership model (β = -.0086, $p > .05$) or the shared instructional leadership model (β = .16, p >. 05). This is consistent with the results from the correlation analyses for the principal behaviors where the extremely small positive relationships were not statistically significant.

Table 8.
Multilevel Regression: Exposure to Rewards

	Principal Engagement		Supportive Leadership		Shared Instructional Leadership	
	β	SE	β	SE	β	SE
Level-1						
%Female teachers	-.0201	.29	-.0845	.23	-.184	.26
%White teachers	.4849	.33	.8028**	.22	-.2399	.18
%Master's	.0811	.17	.048	.11	.1443	.12
%Fully certified	-.3300	.20	.3315*	.17	-.3184	.27
%Daily attendance	.0014	.00	-.002	.00	.0022	.00
Hours/week spent with students	.0049	.00	.007**	.00	-.0062*	.00
Vice Principals	.1912*	.08	.0481	.09	-.0293	.09
Experience	-.0004	.01	-.0062	.00	.0125*	.00
Salary (x1000)	.0080*	.00	.005*	.00	-.002*	.00
Female	.0738	.08	.107	.08	-.0299	.07
School size	-.0002	.00	.00010	.00	-.0022	.00
School poverty	-.2327	.16	-.4418***	.11	-.0863	.13
Principal engagement	---	--	.0083	.04	-.0047	.03
Principal supportive leadership	.0141*	.04	---	--	.303***	.05
Shared instructional leadership	-.0009	.03	.3028***	.04	---	--
Overall reward	.0264	.08	.1497	.06	-.008	.06
Monetary School	-.3260***	.07	.2864	.15	-.2497	.15
Monetary Teacher	-.2131	.14	-.0086	.09	.16	.10
Nonmonetary	.0763	.08	.0775	.07	.0286	.07
Monetary School x Size	.0007*	.03	-.0006	.00	.0006	.00
Monetary Teacher x Size	.0000	.00	-.0000	.00	-.0002	.00
Nonmonetary x Size	-.0005	.00	.0000	.00	.0000	.00
Monetary School x Poverty	-.3319	.20	.0173	.19	-.0827	.23
Monetary Teacher x Poverty	-.3925	.44	.1749	.26	.1817	.35
Nonmonetary x Poverty	-.696*	.33	.2695	.28	-.1200	.41
Level-2						
Intercept	-0.077	.08	.0052	.06	-0.106	.11
State influence over instruction	.0147	.12	.3169*	.14	-.5173***	.12
Northeast	.3306*	.11	-.164	.18	.3568*	.17
Midwest	.0196	.09	-.1029	.12	.1378	.10
South	.0319	.14	-.0274	.11	.1981	.18

NOTE: Results from this table are from 30 different multilevel models. Findings related to the control variables are from the fully conditional model with overall reward. Findings related to school size and school context interactions are from separate statistical models.

In general, nonmonetary rewards were not related to the three principal behaviors. As shown in Table 7, the nested models with the predictor for nonmonetary reward were not associated with significantly less deviance for principal engagement ($\chi^2 = 1.189$, $p > .05$), supportive leadership ($\chi^2 = 1.359$, $p > .05$), or shared instructional leadership ($\chi^2 = .1829$, $p > .05$). While all of the fixed effects presented in Table 8 show that nonmonetary rewards had a positive relationship with the principal behaviors, these fixed effects were not statistically significant; nonmonetary rewards were not significantly related principal engagement ($\beta = .0763$, $p > .05$), supportive leadership ($\beta = .0775$, $p > .05$), or to shared instructional leadership ($\beta = .0286$, $p > .05$). Again, this is consistent with the results from the correlation analyses where the relationships between nonmonetary rewards and the three principal behaviors were positive yet not statistically significant. Thus, after accounting for the control variables and nested nature of principals within states, the positive relationships between nonmonetary rewards and principal behaviors were neither statistically nor practically significant.

Research Question 3: Exposure to Intervention and Principal Behavior

There were 690[8] principals in the analysis of research question three. Principals in schools that did not meet performance goals in the previous academic year had an average of about 8 years of experience as a principal, and had an average salary of about $71,412. On average, these principals worked in schools that had about 87% female teachers, 83% White teachers, 43% teachers with Master's degrees, and 89% teachers who were fully certified. Schools tended to be medium-large with an average of about 453 students. On average, 56% of

[8] 30 schools were dropped due to missing values

students in these schools were eligible for free or reduced price lunch and the average daily attendance rate was about 89% (see Table 9).

Table 9.
Descriptive Statistics for Schools that Did Not Meet Performance Goals

	N	Minimum	Maximum	Mean	SD
Northeast	690	0	1	.1749	.3801
Midwest	690	0	1	.2413	.4282
South	690	0	1	.2919	.4550
West	690	0	1	.3006	.4559
State Poverty	720	.22	.8	.4588	.12639
State influence over instruction	720	2	10	7.2737	1.10330
% Female teachers	700	0	1	.8675	.19460
% White teachers	700	0	1	.8255	.28714
% Teachers with Master's degrees	700	0	1	.4284	.31548
% Fully Certified teachers	700	0	1	.8948	.18480
School Poverty	720	0	1	.5604	.28408
Average daily attendance	720	0	100	93.14	12.446
School size	720	23	1828	453.53	217.822
Number of vice principals	720	0	4	.34	.538
Female	720	0	1	.6439	.4792
Experience	720	0	41	8.00	7.297
Salary	720	23000	117700	71412.94	14870.474
Hours per week spent with students	720	1	100	21.99	13.007
Principal Engagement	720	1	4	3.2972	.60353
Supportive Leadership	700	1.5	4	3.4250	.43669
Shared Instructional Leadership	700	1.2	3.9	2.7771	.45231

Correlations

The full correlation matrix for research question three is provided in Table D3. Tables 10A – 10D provide key correlations for the sample of principals in schools that did not meet all performance goals. As shown in Table 10A, principal engagement was correlated with Northeast region of the U.S. ($r = .095$, $p < .01$) and percentage female teachers ($r = .091$, $p < .05$) but not to school size ($r = -.072$, $p > .05$) or poverty ($r = -.046$, $p > .05$).

Table 10A.
Key Correlations between Control Variables and Principal Engagement among Schools that Did Not Performance Goals

	Principal Engagement
Northeast	.095**
% Female teachers	.091*
School size	-.072
School poverty	-.046

Note: *$p < .05$, ** $p < .01$

As shown in Table 10B, supportive leadership was correlated with Northeast region of the U.S. ($r = -.10$, $p < .05$) and the percentage certified teachers ($r = .124$, $p < .01$) but not to school size ($r = -.07$, $p > .05$) or school poverty ($r = -.069$, $p > .05$). As shown in Table 10C, shared instructional leadership was also correlated with some control variables: Midwest region of the U.S. ($r = .091$, $p < .01$), salary ($r = -.181$, $p < .01$), number of vice principals ($r = -.196$, $p < .01$), school size ($r = -.209$, $p < .01$), and school poverty ($r = -.139$, $p < .01$).

Table 10B.
Key Correlations between Control Variables and Supportive Leadership among Schools that Did Not Performance Goals

	Supportive Leadership
Northeast	-.100*
% Certified teachers	.124**
School size	-.07
School poverty	.069

Note: *$p < .05$, ** $p < .01$

Table 10C.
Key Correlations between Control Variables and Shared Instructional Leadership among Schools that Did Not Performance Goals

	Shared Instructional Leadership
Midwest	.091**
Salary	-.181**
# Vice principals	-.196**
School size	-.209**
School poverty	-.139**

Note: *$p < .05$, ** $p < .01$

The principal behaviors were correlated. Principal engagement and supportive leadership were correlated ($r = .139$, $p < .01$), and shared instructional leadership and supportive leadership were positively correlated ($r = .198$, $p < .01$). As shown in Table 10D, the principal behaviors were negatively correlated with exposure to the interventions. Principal engagement was negatively correlated with state takeover ($r = -.119$, $p < .01$) and being put on a school improvement plan ($r = -.075$, $p < .05$). Supportive leadership was negatively correlated with overall interventions ($r = -.885$, $p < .01$), evaluation cycle ($r = -.096$, $p < .01$), supplemental education services ($r = -.08$, $p < .01$), and school choice ($r = -.084$, $p < .01$). Shared instructional leadership was also negatively correlated with overall interventions ($r = -.142$, $p < .01$), school improvement plan ($r = -.09$, $p < .01$), additional resources ($r = -.125$, $p < .01$), reduced resources ($r = -.107$, $p < .01$), supplemental education services ($r = -.19$, $p < .01$), and school choice ($r = -.226$, $p < .01$).

Table 10D.
Key Correlations between Exposure to Intervention and Principal Behavior among Schools that Did Not Performance Goals

	PE	SL	SIL
Overall intervention	-.061	-.088*	-.142**
School improvement	-.075*	-.051	-.091*
Evaluation cycle	-.07	-.096*	-.067
Additional resources	.026	-.041	-.125**
Reduced resources	-.013	-.021	-.107**
State takeover	-.119**	-.072	-.064
Supplemental Educational services	-.018	-.08*	-.19**
School choice	-.059	-.084*	-.226**

Note: *$p < .05$, ** $p < .01$

Based on the results from the correlation analysis, further investigation of the relationships between exposure to intervention and principal behaviors was warranted. The principal behaviors were related to some of the control variables, yet in different ways. As shown

in Table 10D, the separate intervention types were correlated with certain principal behaviors (in 10 out of 21 correlations) and these relationships may change after controlling for the covariates, or may differ according to school size or poverty.

Results from Multilevel Regression

In this section, results from χ^2 difference tests are presented along with results of the fixed effects associated with overall reward models as well as the models for the specific rewards. Based on the test of χ^2 difference (see Table 11), overall intervention explained significant variation in shared instructional leadership, $\chi^2 = 5.7112$, $p <. 05$ but not in principal engagement $\chi^2 = 1.1387$, $p >. 05$ or in shared instructional leadership $\chi^2 = 1.7779$, $p >. 05$. The fixed effects associated with overall intervention were all negative but were not statistically significant for principal engagement ($\beta = -.0848$, $p > .05$), supportive leadership ($\beta = -.1125$, $p > .05$), or shared instructional leadership ($\beta = -.1932$, $p > .05$). Relating this back to the correlation analyses, the negative relationships that overall intervention had with both supportive leadership and shared instructional leadership were not statistically significant after accounting for the control variables.

For all three principal behaviors, the intervention for requirement of a school improvement plan was not associated with a reduction in deviance for nested models nor was its fixed effect statistically significant. As shown in Table 11, the deviance statistic associated with the model containing the predictor for school improvement plan was not significantly lower for principal engagement ($\chi^2 = 3.5577$, $p >. 05$), supportive leadership ($\chi^2 = .89$, $p >. 05$), or shared instructional leadership ($\chi^2 = 1.946$, $p >. 05$). Likewise, the fixed effect for school improvement plan was not significantly associated with principal engagement ($\beta = -.1361$, $p > .05$), supportive

leadership (β = -.0729, $p > .05$), or shared instructional leadership (β = -.1037, $p > .05$). The statistically significant negative relationship between school improvement plan and shared instructional leadership from the correlation analysis no longer existed after accounting for the control variables.

The intervention of evaluation cycle was negatively associated with supportive leadership. The model containing the predictor for this intervention had a significantly lower deviance statistic when compared to the model with control variables, $\chi^2 = 4.732$, $p <. 05$ (see Table 11) and the fixed effect was related to supportive leadership, β = -.1946, $p < .05$ (see Table 12). Principals in schools that were put on an evaluation cycle demonstrated supportive leadership that was .2σ lower than that demonstrated by principals in schools that were not put on an evaluation cycle. However, while this relationship was statistically significant, the relationship may not be considered practically significant. The evaluation cycle intervention was not significantly associated with principal engagement or with shared instructional leadership. The χ^2 difference test associated with principal engagement was not statistically significant, $\chi^2 = 1.0876$, $p > .05$, and the fixed effect was not statistically significant either, β = -.0878, $p > .05$. Similarly, the deviance associated with the evaluation cycle model was not significantly lower than that of the control variable model for shared instructional leadership ($\chi^2 = .0403$, $p > .05$), and the fixed effect was also not significant, β = -.0173, $p > .05$. The intervention for additional resources was not associated with a reduction in deviance for nested models nor was its fixed effect statistically significant. As shown in Table 11, the deviance statistic associated with the model containing the predictor for additional resources was not significantly lower for principal engagement ($\chi^2 = .3434$, $p >. 05$), supportive leadership ($\chi^2 = .318$, $p >. 05$), or shared instructional leadership ($\chi^2 = 3.239$, $p >. 05$). Similarly, the fixed effect for additional resources

was not significantly associated with principal engagement (β = .0433, $p > .05$), supportive leadership (β = -.0442, $p > .05$), and shared instructional leadership (β = -.1355, $p > .05$). The statistically significant negative relationship between additional resources and shared instructional leadership from the correlation analysis no longer existed after accounting for the control variables.

Table 11.
Incremental Model Fit: Exposure to Intervention

	Principal Engagement		Supportive Leadership		Shared Instructional Leadership	
	χ^2	*p*-value	χ^2	*p*-value	χ^2	*p*-value
Overall intervention	1.1387	.286	1.7779	.179	5.7112	.016
Require improvement plan	3.5577	.056	.89	> .50	1.946	.159
Evaluation cycle	1.0876	.297	4.732	.028	.0403	> .50
Additional resources	.3434	>.500	.318	> .50	3.2385	.068
Reduced resources	.0045	>.500	.0492	> .50	6.835	.009
State Takeover	4.6188	.03	1.42	.231	.0059	> .50
Free SES	.2741	> .500	.343	> .50	9.7613	.002
Free Choice	1.4465	.227	.1512	> .50	18.4219	< .001
Require improvement plan X size	8.7524	.003	2.4758	.111	1.5072	.217
Evaluation cycle X size	3.8146	.048	.1030	> .50	.2761	> .50
Additional resources X size	.6579	> .500	.0091	> .50	1.1126	.292
Reduced resources X size	.3165	> .500	.5877	> .50	.1457	> .50
State Takeover X size	3.3939	.062	.3031	> .50	2.846	.09
Free SES X size	.0112	> .500	.0169	> .50	2.3197	.124
Free Choice X size	1.8324	.172	.0312	> .50	3.3222	.065
Require improvement plan X poverty	.2647	> .500	.704	> .50	.051	> .50
Evaluation cycle X poverty	1.7424	.184	.487	> .50	.0143	> .50
Additional resources X poverty	3.7992	.048	.21	> .50	1.1781	.277
Reduced resources X poverty	.0001	> .500	.25224	> .50	2.3472	.121
State Takeover X poverty	3.446	.06	.0722	> .50	.0489	> .50
Free SES X poverty	.0311	> .500	5.3878	.019	1.4261	.230
Free Choice X poverty	4.786	.027	3.2647	.067	.49	> .50

The intervention of reduced resources was associated with significantly lower shared instructional leadership. As shown in Table 11, the deviance statistic associated with the model containing the predictor for reduced resources was significantly lower for shared instructional leadership ($\chi^2 = 6.835$, $p <. 01$). The results from the correlation analyses where reduced resources had a significant negative association with shared instructional leadership were supported by the multilevel regression analysis. Specifically, reduced resources had a significant negative association with shared instructional leadership ($\beta = -.4729$, $p < .01$) as shown in Table 12. This relationship may be considered practically significant; principals in schools that were subjected to a reduction in resources due to poor performance had nearly .5s lower shared instructional leadership compared to principals in schools that were not subjected to such an intervention. The intervention of reduced resources did not have the same relationship with the other two principal behaviors as the models with this indicator did not have significantly lower deviance statistics for principal engagement ($\chi^2 = .0045$, $p >. 05$) or for supportive leadership ($\chi^2 = .049$, $p >. 05$), as shown in Table 11. Corroborating results from the correlation analysis, the fixed effects associated with reduced resources were not significant for principal engagement ($\beta = -.0219$, $p > .05$) or for supportive leadership ($\beta = -.0421$, $p > .05$).

Table 12
Multilevel Regression: Exposure to Intervention

	Principal Engagement		Principal Supportive Leadership		Shared Instructional Leadership	
	β	SE	β	SE	β	SE
Level-1						
%Female teachers	.462*	.23	-.1892	.20	-.1244	.19
%White teachers	.0206	.25	.1055	.16	-.3573	.27
%Master's	-.1097	.15	.1268	.21	.124	.15
%Fully certified	-.0388	.22	.5128	.22	-.0477	.22
%Daily attendance	.0036	.00	.003	.00	.001	.00
Hours/week spent with students	.0033	.00	.0051	.00	-.0033	.00
Vice Principals	.0378	.10	.0142	.08	-.1503	.1
Experience	.0029	.00	-.01*	.01	.0083	.00
Salary (x1000)	.002	.00	.007	.00	-.001***	.00
Female	.0579	.06	-.0364	.15	.0242	.11
School size	-.0003	.00	-.0002	.00	-.0003	.00
School poverty	.006	.17	-.2076	.20	-.2992	.23
Principal engagement	---	--	.1429**	.05	.0000	.04
Principal supportive leadership	.1273*	.04	---	--	.18**	.06
Shared instructional leadership	-.0002	.04	.1942**	.07	---	--
Overall intervention	-.0848	.10	-.1125	.1	-.1932	.12
Require plan	-.1361	.11	-.0729	.11	-.1037	.08
Evaluation cycle	-.0878	.11	-.1946*	.09	-.0173	.09
Additional resources	.04331	.10	-.0442	.10	-.1355	.09
Reduced resources	-.0219	.33	-.0421	.18	-.4729**	.17
State Takeover/Reconstitution	-.4576	.32	-.2722	.18	-.0169	.20
FreeSES	-.0497	.11	-.0591	.13	-.3028	.16
FreeChoice	-.1183	.12	-.0412	.13	-.4331**	.15
Require Plan x Size	.001	.00	.0006	.00	.004	.00
Evaluation Cycle x Size	.0007	.00	-.0001	.00	-.0002	.00
Additional Resources x Size	-.0003	.00	-.0000	.00	.0004	.00
Reduced Resources x Size	.0005	.00	.0007	.00	.0003	.00
Reconstitution x Size	.0015	.00	-.0005	.00	.0014*	.00
Free SES x Size	.0000	.00	.0000	.00	.0006	.00
Free Choice x Size	-.0006	.00	.0000	.00	.0008	.00
Require Plan x Poverty	-.1412	.10	-.2254	.31	.0582	.26
Evaluation Cycle x Poverty	.3909	.41	-.2184	.37	-.0361	.24
Additional Resources x Poverty	-.5004	.32	-.125	.28	.2839	.27
Reduced Resources x Poverty	.1300	.31	-.3672	.51	-1.066	.59
Reconstitution x Poverty	1.2926	1.0	-.1997	.28	-.159	.53
Free SES x Poverty	-.0638	.56	-.889*	.36	-.4397	.48
Free Choice x Poverty	.8072	.53	-.7109*	.32	-.263	.43

Table 12 (*cont'd.*)

	Principal Engagement		Principal Supportive Leadership		Shared Instructional Leadership	
	β	SE	β	SE	β	SE
Level-2						
Intercept	.1028	.10	.1036	.08	.013	.14
State influence over instruction	.0217	.15	-.017	.13	-.4828*	.23
Northeast	.2101	.14	-.3942	.26	.3002	.20
Midwest	.0225	.11	-.0936	.10	.1507	.17
South	-.1264	.14	.0999	.16	.1709	.18

Note: *$p < .05$, ** $p < .01$, $p < .001$. Results shown are from 69 different statistical models.

From a statistical perspective, the intervention of state takeover was overall not related to the three principal behaviors. While the model with the indicator for state takeover had a significantly lower deviance statistic relative to the model with control variables ($\chi^2 = 4.619$, $p <$. 05), the fixed effect associated with state takeover was not statistically significant ($\beta = -.4576$, $p >$ .05). From a practical significance perspective, however, this difference seems important to consider; principals in schools subjected to reconstitution or state takeover had nearly .5σ lower engagement compared to principals in other low-performing schools. The intervention of state takeover or reconstitution did not have the same relationship with the other two principal behaviors as the models with this indicator did not have significantly lower deviance statistics for supportive leadership ($\chi^2 = 1.42$, $p >$. 05) or for shared instructional leadership ($\chi^2 = .0059$, $p >$. 05), as shown in Table 11. Corroborating results from the correlation analysis, the fixed effects associated with reduced resources were not significant for supportive leadership ($\beta = -.2722$, $p >$ .05) or for supportive leadership ($\beta = -.0169$, $p > .05$).

The intervention of supplemental educational services was not related to principal engagement or supportive leadership. As shown in Table 11, the models with this indicator did

not have significantly lower deviance statistics for principal engagement (χ^2 = .2741, p >. 05), supportive leadership (χ^2 =.343, p >. 05). Similar to the correlation analysis, the negative association between supplemental educational services and principal engagement was not statistically significant (β = -.0497, p > .05). While the correlation between supplemental educational services and supportive leadership was significant, the relationship was not statistically significant in the multilevel model (β = -.0591, p > .05). The model with the indicator for supplemental educational services predicting shared instructional leadership had a significantly lower deviance statistic relative to the control variable model (χ^2 =9.7613, p <. 01) however the small relationship demonstrated by the .2 correlation was not statistically upheld in the multilevel model because the fixed effect associated with this intervention was not statistically significant (β = -.3028, p > .05).

The intervention of school choice was negatively associated with all three principal behaviors. However, the models with this indicator did not have significantly lower deviance statistics for principal engagement (χ^2 = 1.45, p >. 05) or supportive leadership (χ^2 =.1512, p >. 05) nor were the fixed effects for this indicator statistically significant, β = -.1183, p > .05 and β = -.0412, p > .05, for principal engagement and supportive leadership, respectively. The model for shared instructional leadership however demonstrated that the indicator for school choice intervention did significantly reduce the variance (χ^2 =18.422, p <. 001). Specifically, principals in schools that were required to offer students school choice or the option to transfer at the expense of the school demonstrated significantly less shared instructional leadership, β = -.4331, p < .01. This corroborates the findings from the correlational analysis where a small relationship was detected; compared to principals in other low-performing schools, principals in schools with the school choice intervention demonstrated .43σ lower shared instructional leadership.

Research Question 4: School Context, Accountability, and Principal Behaviors

State Policy for Reward and/or Intervention, School Size, and Principal Behaviors

State policy for reward and/or intervention did not alter the relationship between school size and the principal behaviors. Table 3 shows that for all three principal behaviors, model fit was not improved after including the indicators for reward policy and intervention policy. As shown in Table 4, the indicator for state policy for reward on the slope for school size was not significant for principal engagement $\beta = .0005$, $p > .05$, supportive leadership $\beta = .0005$, $p > .05$, or shared instructional leadership $\beta = -.0003$, $p > .05$. Similarly, the indicator for state policy for intervention was not significant for the size slope in the models for principal engagement $\beta = -.0002$, $p > .05$, supportive leadership $\beta = .0000$, $p > .05$, and shared instructional leadership $\beta = .0005$, $p > .05$. In summary, the relationship between school size and principal behavior was the same regardless of state policy for reward or state policy for intervention.

State Policy for Reward and/or Intervention, School Poverty, and Principal Behaviors

State policy for reward and/or intervention did alter the relationship between school poverty and one of the principal behaviors. As shown in Table 3, the model fit for principal engagement improved when state policy for reward and state policy for intervention were added to the poverty slope, $\chi^2 = 7.364$, $p <. 05$. As shown in Table 4, the interaction between school poverty and state reward policy was significant for principal engagement $\beta = -.4241$, $p < .05$. The negative impact that school poverty had on principal engagement was weaker in states with reward policy. Also, the interaction between state policy for intervention and school poverty was

significant for principal engagement β = .4303, $p < .05$. The negative relationship between school poverty and principal engagement was exacerbated in states that had intervention policy.

State policy for reward and/or intervention did not explain additional variance in the poverty slope for the other two dependent variables. As shown in Table 3, the model fit for supportive leadership and shared instructional leadership was not improved when the indicators for state reward and state policy were added to the poverty slope, χ^2 =0.069, $p >$. 05 for supportive leadership and χ^2 =1.234, $p >$. 05 for shared instructional leadership. Similarly, the fixed effects in Table 4 demonstrated that the interactions between state policy for reward and school poverty was not significant for supportive leadership β = -.0492, $p > .05$, or shared instructional leadership β = -.2134, $p > .05$. In other words, the negative impact of school poverty on supportive leadership and shared instructional leadership was the same regardless of state policy for reward. Similarly, state policy for intervention did not significantly relate to the relationship between school poverty and supportive leadership, β = .0122, $p > .05$ or the relationship between school poverty and shared instructional leadership, β = .1757, $p > .05$.

Exposure to Reward, School Size, and Principal Behaviors

Overall, there were no differences in how exposure to different types of rewards related to principal behavior across schools of different sizes. As shown in Table 7, the model fit did not significantly improve after including interaction terms in the statistical models. Looking first at principal engagement, the model fit for monetary school wide reward did not improve after including the interaction with school size, $\chi^2 = 3.389$, $p >$. 05. The fixed effect associated with the interaction term, however, was statistically significant, β = .0007, $p < .05$ (see Table 8). In other words, the negative relationship between monetary school reward and principal

engagement was slightly exaggerated in larger schools. The model fit for monetary teacher reward did not significantly improve after accounting for the interaction with school size (χ^2 = 0.0013, p >. 05) and the fixed effect was not significant, β = .0000, p > .05. The model fit for nonmonetary reward did not significantly improve after accounting for the interaction with school size (χ^2 =2.4867, p >. 05) and the fixed effect was not significant, β = -.0005, p > .05.

In terms of supportive leadership, there were no interactions between rewards and school size. As shown in Table 7, all of the tests of incremental model fit revealed that including the interaction term for reward and school size did not improve model fit for monetary school reward (χ^2 = 2.716, p > .05), monetary teacher reward (χ^2 = .0057, p > .05), or for nonmonetary reward (χ^2 = 0.000, p > .05). Similarly, the fixed effects associated with each of the interaction terms were not statistically significant. The interactions between monetary school reward and school size (β = -.0006, p > .05), monetary teacher reward and school size (β = -.0000, p > .05), and nonmonetary reward and school size (β = .0000, p > .05) all indicated that school size did not affect the relationships between different types of rewards and supportive leadership.

In terms of shared instructional leadership, there were no interactions between rewards and school size. As shown in Table 7, all of the tests of incremental model fit revealed that including the interaction term for reward and school size did not improve model fit for monetary school reward (χ^2 = 2.608, p > .05), monetary teacher reward (χ^2 = .4423, p > .05), or for nonmonetary reward (χ^2 = .006, p > .05). Similarly, the fixed effects associated with each of the interaction terms were not statistically significant. The interactions between monetary school reward and school size (β = .0006, p > .05), monetary teacher reward and school size (β = -.0002, p > .05), and nonmonetary reward and school size (β = .0000, p > .05) all indicated that school

size did not affect the relationships between different types of rewards and shared instructional leadership.

Exposure to Reward, School Poverty, and Principal Behaviors

For the most part, school poverty did not impact the relationships between rewards and principal behavior. There was one exception with regard to principal engagement, however. While the interactions between monetary school reward and school poverty and monetary teacher reward and school poverty were not significant in predicting principal engagement, the interaction between nonmonetary reward and school poverty was. In other words, results from tests of incremental model fit (Table 7) and fixed effects (Table 8) indicated that the relationship between nonmonetary reward and principal engagement was impacted by school poverty. Specifically, the overall model fit improved after accounting for this interaction ($\chi^2 = 3.9717$, $p < .05$), and the fixed effect associated with the interaction was statistically significant, $\beta = -.696$, $p < .05$; the very small positive relationship between nonmonetary reward and principal engagement was reduced in schools with higher poverty (see Tables 7-8). Model fit for principal engagement models did not improve after accounting for monetary school reward and school poverty interactions ($\chi^2 = 1.9117$, $p > .05$), or monetary teacher reward and school poverty interactions ($\chi^2 = 1.2618$, $p > .05$). Likewise, the fixed effects associated with these interactions were not significant for monetary school, $\beta = -.3319$, $p > .05$, and for monetary teacher, $\beta = -.3925$, $p > .05$.

The model predicting supportive leadership was not improved after accounting for the interaction between different reward types and school poverty. The test statistics associated with the incremental change were $\chi^2 = .0058$, $p > .05$ for monetary school reward, $\chi^2 = .2807$, $p > .05$

for monetary teacher reward, and $\chi^2 = .6654$, $p > .05$ for nonmonetary reward. The fixed effects associated with these interaction terms were likewise not statistically significant for monetary school reward, $\beta = .0173$, $p > .05$, monetary teacher reward, $\beta = .1749$, $p > .05$, and for nonmonetary reward, $\beta = .2695$, $p > .05$.

School poverty also did not affect the relationships between reward types and shared instructional leadership models. Tests of incremental model fit (Table 7) demonstrated that including interaction terms between reward types and school poverty did not result in significantly better model fit; likewise, none of the fixed effects associated with the interaction terms were statistically significant (Table 8). The change statistic for monetary school reward and school poverty interaction was $\chi^2 = .1363$, $p > .05$, for monetary teacher reward and school poverty interaction was $\chi^2 = .3038$, $p > .05$, and for nonmonetary reward and school poverty interaction was $\chi^2 = .1323$, $p > .05$. The fixed effects were $\beta = -.0827$, $p > .05$ for monetary school and poverty interaction, $\beta = .1827$, $p > .05$ for monetary teacher and school poverty interaction, and $\beta = -.1200$, $p > .05$ for nonmonetary reward and school poverty interaction.

Exposure to Intervention, School Size, and Principal Behaviors

The relationships between different types of interventions and the principal behaviors were generally not impacted by school size. Overall, the change statistics indicated that addition of interactions between specific intervention types and school size did not significantly improve model fit for any of the outcomes (see Table 11). There were two exceptions in models predicting principal engagement. In the model with requirement of improvement plan, the addition of the interaction term significantly improved overall model fit ($\chi^2 = 8.7524$, $p < .01$) however the corresponding fixed effect was not significant ($\beta = .001$, $p > .05$). Similarly, in the

model with evaluation cycle intervention predicting principal engagement, the addition of the interaction between intervention and school size significantly improved model fit ($\chi^2 = 3.8146$, $p < .05$) however the corresponding fixed effect was not significant ($\beta = .0007$, $p > .05$). In the model with the state takeover intervention predicting shared instructional leadership, addition of the interaction between intervention and school size did not significantly improved model fit ($\chi^2 = 2.846$, $p < .05$) however the fixed effect associated with the interaction term was statistically significant ($\beta = .0014$, $p < .05$) and indicated that the negative impact of reconstitution on shared instructional leadership was slightly exacerbated in larger schools.

Other than these three exceptions, the relationships between each of the interventions and each of the principal behaviors was consistent across schools of different sizes. Context of school size did not appear to strongly impact how intervention related to principal behavior.

Exposure to Intervention, School Poverty, and Principal Behaviors

For the most part, school poverty did not impact the relationships between specific intervention types and principal behaviors. The majority of the change statistics for models including interaction terms between intervention and school poverty were not statistically significant (see Table 11), and neither were the fixed effects associated with the interaction terms (see Table 12).

There was one intervention that had a statistically significant interaction with poverty in relation to supportive leadership; accounting for the interaction between free SES and poverty reduced the variance in supportive leadership, $\chi^2 = 5.3878$, $p < .05$, and the fixed effect associated with this interaction was significant, $\beta = -.889$, $p > .05$. The negative relationship

between offering free SES and supportive leadership was not as pronounced in higher poverty schools.

There were a few interventions where findings for the change statistics and the fixed effects were inconsistent; either the change statistic or the fixed effect was statistically significant, but not both. The fit of the model with additional resources intervention predicting principal engagement was significantly improved after adding the interaction between intervention and poverty, ($\chi^2 = 3.7992$, $p < .05$). The corresponding fixed effect, however, was not statistically significant ($\beta = -.5004$, $p > .05$). The same was true for the model with school choice predicting principal engagement; while the overall model fit was significantly improved upon addition of the interaction between intervention and school poverty, ($\chi^2 = 4.786$, $p < .05$), the fixed effect associated with the intervention was not significant, $\beta = .8072$, $p > .05$.

In the model with school choice predicting supportive leadership, addition of the interaction between intervention and school poverty did not significantly improve overall model fit, ($\chi^2 = 3.2647$, $p > .05$) however the fixed effect associated with this interaction was statistically significant, ($\beta = -.7109$, $p < .05$) and suggested that the negative relationship between school choice and supportive leadership was weaker in schools with higher poverty.

CHAPTER FIVE:

DISCUSSION

Performance-based rewards and interventions remain at the forefront of the school accountability movement. The goal of school accountability and its incentives is to improve student achievement. Research has demonstrated that direct relationships between principals and student achievement are tenuous (e.g. Hallinger & Heck, 1996; Hallinger, Bickman, & Davis, 1998) meaning that realization of this goal may not necessarily involve principals. However, research has also shown that principals indirectly impact student outcomes through teacher recruitment, selection, retention, and strategic goal-setting (Brewer, 1993; Rice, 2010; Witziers, Bosker, & Krüger, 2003; Hallinger, Bickman, & Davis, 1996). Drawing on this logic, the ways in which principals react to accountability measures is important to investigate because it may indirectly impact student achievement.

This perspective is aligned with the logic behind the theory of action of accountability policies (Smith & O'Day, 1990; Figlio & Ladd, 2007; Figlio & Loeb, 2011) which posits that incentive-based policies will impact student performance, in part by motivating school principals and teachers to behave in ways that are aligned with performance standards, effective practice, and student achievement. However, as outlined in the preceding chapters, there are significant limitations to this theory (Elmore, 1996; O'Day, 2002) and findings from this dissertation demonstrate that the theory of action of accountability was not empirically supported. When faced with incentives such as performance-based reward(s) or intervention(s), principals were not consistently motivated towards leadership practices that have been associated with positive outcomes in existing research. State policy for rewards and state policy for interventions were

negatively associated with certain principal behaviors, exposure to rewards had both positive and negative associations with principal behaviors, and exposure to intervention generally had negative relationships with all three principal behaviors. While the goal of performance-driven accountability is strictly on student achievement, that there is a null and sometimes negative impact on school leaders is not a particularly promising finding with regard to policy efficacy and sustainability. If there are no positive effects on student achievement and only negative effects on principal behavior, then performance-based accountability is arguably not effective practice.

Findings that suggest a negative association between policy and principal behaviors are particularly troubling because states continue to move towards incentives-based practices for schools. Figure 5 shows the growth in the number of states participating in incentive programs for Title 1 and non-Title 1 schools since 2000. As of 2012, 32 states reported using interventions in low-performing schools and 37 states reported using rewards for schools that were demonstrating improvement or good performance (EPE, 2014). Indeed, much of this growth had to do with NCLB rollout in 2003 because the policy mandated interventions in consistently low-performing Title 1 schools. In response to concerns that 100% proficiency mandated under NCLB could not be met by 2014, most states have applied for and been granted flexibility (i.e. waivers) for meeting proficiency deadlines and implementing performance-based incentives (Polikoff et al., 2014); as of December 2014, the majority of states (45 states) had been granted waivers for NCLB following guidelines from the Department of Education.

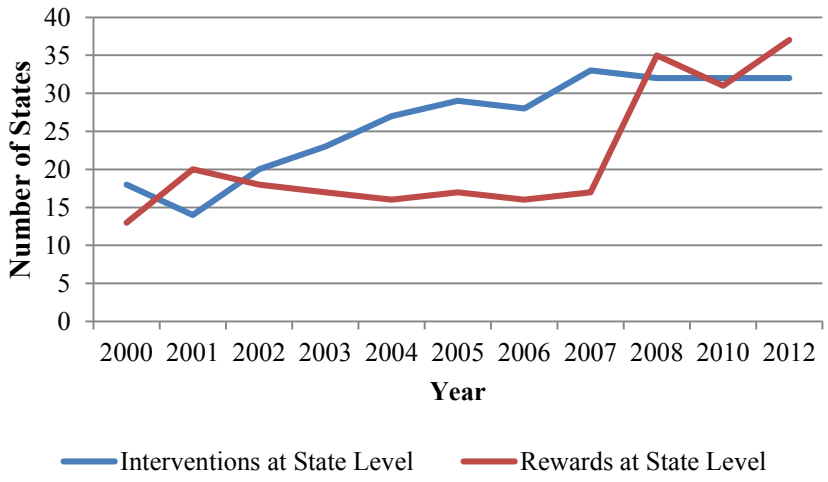

Figure 5. Growth in School Reward and Intervention in U.S. states between 2000 and 2012 for Title 1 and non-Title 1 schools. This figure shows the number of states implementing reward and intervention policy across the past decade. There are no data available for 2009 and 2011.

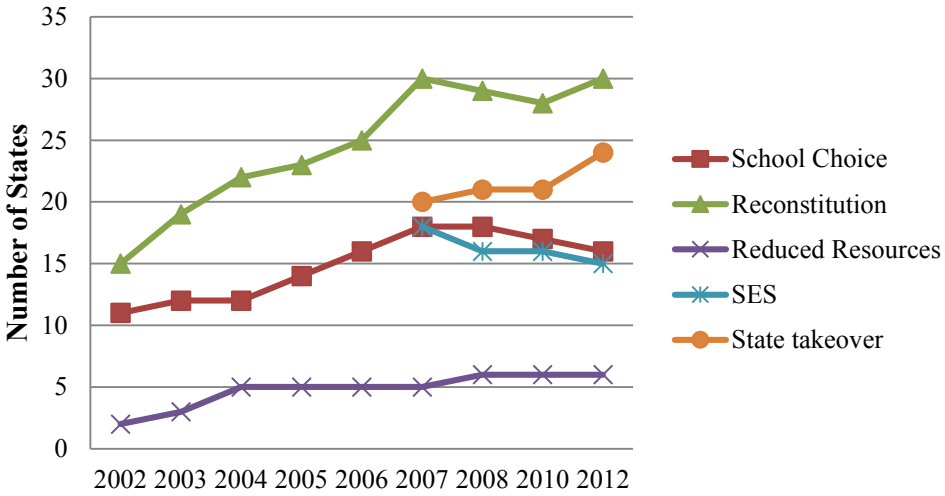

*Figure 6.*Growth in Specific Types of Performance-Based Interventions in U.S. States between 2002 and 2012 for Title 1 and non-Title 1 schools. This figure shows the number of states implementing different interventions in the past decade. There was no data available for 2009 and 2011.

In order to qualify for a waiver, states are required to detail a system for categorizing schools that include "reward," "priority," and "focus" schools. In terms of interventions, waiver states now have more flexibility with regard to the number of schools in which to intervene because these states are not required to intervene in every school that fails to meet AYP as was the case under NCLB. As shown in Figure 6, there was enormous growth in the number of states using interventions in both Title 1 and non-Title 1 schools over the past decade, again due largely to NCLB. For example, more states were using school choice, reconstitution, reduced resources, and state takeover in 2012 compared to 2002[9]. Moving forward with the waiver-based accountability system, there will be changes related to intervention type and target; for example, certain interventions such as supplemental educational services and school choice interventions appear to be phasing out in specific states (e.g. New York State).

However, performance-based incentives are still an integral part of the new waiver-based accountability system and interventions are required components of individual state assessment plans. States are still required to intervene on "focus" schools and, as the name implies, it would appear that "reward" schools will be rewarded. In other words, even with waivers for accountability, performance-based incentives are not disappearing. So are we moving in the right direction in terms of school accountability? In the following sections, this question is revisited as findings are summarized in relation to the hypotheses articulated in Chapter 2. The

[9] In terms of specific types of interventions as of 2012, 18 states reported intervening in the form of school closure, 30 states reported intervening by reconstitution of schools, 16 states reported intervention by means of mandating school choice, 6 states reported reducing resources or withholding funds, 18 states reported intervening school conversion to charter schools, 15 states reported offering supplemental educational services, 25 states reported implementing new curriculum, and 24 states reported state takeover.

limitations of the study and data are discussed. Plans for future research are then presented as well as policy implications, followed by discussion of theory development in this area.

Summary of Findings in Relation to Hypotheses

The underlying hypothesis that performance-based accountability would generally have negative relationships with principal behaviors was weakly supported. Below, the findings from this dissertation are discussed in relation to the specific hypotheses from chapter two. Table 13 provides a brief summary of the findings for hypotheses 1-3, along with information on effect size (i.e. standardized beta coefficients in relation to standardized outcomes).

Table 13.
Summary of Findings in Relation to Hypotheses 1 - 3

	Hypothesis	Status	Summary of Statistically Significant Relationships
H1	State policy for reward and/or intervention will have negative impact on principal behaviors	Weakly supported	**Negative Relationships** • State policy for reward and supportive leadership Effect size -0.14σ, $p < .05$ • State policy for intervention and principal engagement Effect size -0.13σ, $p < .05$ **No Positive Relationships**
H2	Exposure to rewards will have negative impact on principal behaviors	Not supported	**One Negative Relationships** • School-wide reward and engagement, Effect size of -0.3σ, $p < .001$ **No Positive Relationships**
H3	Exposure to interventions will have negative impact on principal behaviors	Moderately supported	**Three Negative Relationships** • Evaluation cycle and supportive leadership, Effect size of -0.2σ, $p < .001$ • Reduced resources and shared instructional leadership Effect size of -0.47σ, $p < .001$ • School choice and shared instructional leadership Effect size of -0.43σ, $p < .001$ **No Positive Relationships**

State Policy for Performance-Based Rewards and Interventions

The first set of hypotheses was that state policy for reward and state policy for intervention would be negatively related to principal behavior. This hypothesis was upheld (see Table 13, top row). State policy for incentives across all types of schools (i.e. Title 1 and non-Title 1) had a general negative impact on principal behavior; performance-based rewards were negatively related to two principal behaviors, and state policy for performance-based intervention was negatively related to all three principal behaviors. The negative relationship between state policy for reward and principal supportive leadership was statistically significant and so was the negative relationship between state policy for intervention and principal engagement. Thus, the first hypothesis was weakly supported; five out of the six relationships were negative and two of these were statistically significant. However, the practical significance of these effects was very small because the effect sizes associated with the policy effects were negligible.

Researchers have speculated that reward policy could have adverse effects on different outcomes, and findings from this study support these claims. As pointed out by Darling-Hammond (2014), "if rewards are competitively allocated, (performance-based) evaluation is likely to undermine efforts towards collective improvements, to the ultimate detriment of teacher and student learning" (p.6). Principals in states exercising performance-based rewards may feel more competitive with other schools and principals, and therefore be less engaged and focus less on being supportive towards teachers. In states with reward policies, the priority is not on creating effective learning environments but on increasing student achievement and this narrow focus may undercut effective leadership. It may also be that performance-based monetary rewards are considered by principals to depreciate school leadership; arguably, educators are not

drawn to the field for reasons related to compensation so monetary rewards may devalue the profession.

Performance-based interventions carry negative stigma, and state policy for this incentive will likewise carry negative stigma. A number of researchers have cautioned against performance-based accountability (e.g. Firestone & Shipps, 2003; Levy & Murnane, 2001; O'Day, 2002). Based on findings from this dissertation, this caution appears to be warranted because state policy for reward and intervention has a negative impact on principal behavior. Principals don't have to even experience the consequences associated with incentives; simply knowing that these incentives are in place is enough to negatively impact behavior. Principals in states with performance-based incentives are experiencing the negative consequences cautioned by policy researchers. O'Day (2002) and Elmore (1990) have discussed the limitations of performance-based accountability and argued that a top-down, large-scale policy approach cannot effectively penetrate all schools and elicit positive change in school leaders and educators. That there are systematic differences in the behaviors of school principals based on state policy for performance-based rewards and interventions suggests that perhaps large-scale policy is actually able to penetrate schools yet its impact is more negative than positive. If this is the case, then we need to consider the costs associated with this type of policy because the negativity felt by principals could trickle down to negatively impact teachers and students.

Exposure to Performance-Based Rewards

The second hypothesis was that exposure to reward will have a negative association with principal behavior; this hypothesis was not supported. There were both positive and negative associations between the different reward types and principal behaviors. While none of the

positive associations were statistically significant, that only one of the negative associations was statistically significant does not sufficiently support the hypothesis that there is a negative association between exposure to reward and principal behavior.

Relating findings back to the theoretical framework, the theory of action of accountability was neither consistently supported nor refuted. For some rewards, the theory of action of accountability (Smith & O'Day, 1990) was supported—exposure to certain types of rewards had a very small positive relationship with principal behaviors. Nonmonetary rewards such as recognition in the local newspaper or internal school recognition had a positive relationships with all three principal behaviors; principals in schools that received nonmonetary forms of recognition were more engaged, demonstrated more supportive leadership, and practiced greater shared instructional leadership relative to principals in schools that did not receive such rewards. Exposure to school-wide monetary rewards had a positive relationship with principal supportive leadership and exposure to monetary rewards for teachers was positively related to shared instructional leadership. However, all of these relationships were neither statistically nor practically significant.

That recognition and reward had positive relationships with certain principal behaviors is aligned with theories of motivation (e.g. Maslow, 1954; Deci, 1975; Deci & Ryan, 1980; Herzberg, 1966). As discussed by Hansen, Smith, and Hansen (2002), recognition and reward represent different motivation subsystems articulated in theories of motivation by Maslow (1974), Deci (1975), and Herzberg (1966). Put simply, social recognition is an intrinsic motivator while monetary rewards are an extrinsic motivator. Principals seemed to be both intrinsically motivated (by recognition) and extrinsically motivated (by monetary reward). More

specifically, they were intrinsically motivated to be engaged, show supportive leadership, and share instructional influence by means of social recognition, and they were extrinsically motivated to demonstrate supportive leadership and shared instructional leadership.

However, there was also evidence that the theory of action of accountability was not upheld and that performance-based rewards had a negative impact on principal behavior. In support of the second hypothesis, there were rewards that had negative relationships with principal behavior. Most notably, monetary rewards for school-wide resources had a significant negative relationship with principal engagement; principals in schools that received funds for school wide investment as a result of good student performance were significantly less engaged relative to principals in schools that did not receive such rewards. The effect size associated with this negative effect was small (-.32σ) however, and the practical significance associated with this finding was not robust. This type of reward also had a negative relationship with shared instructional leadership, however the effect was not statistically significant and the practical significance was not strong (-.25σ). There was also a negative relationship between monetary reward for teachers and principal engagement; principals that were in schools where individual teachers had been rewarded demonstrated lower engagement relative to principals in schools where teachers had not been rewarded individually. This relationship was not statistically significant, and the practical significance was also not strong because the effect size was small (-.21σ).

The negative relationship between monetary reward and principal behavior supports O'Day's (2002) argument that demonstrations of external control (in this case, rewards) serve to disenchant school leaders and educators and also threaten the school's internal organizational

structure. School-wide monetary rewards may communicate to the principal that power is externally located, and this may lead to lower engagement. External monetary rewards may disrupt the balance of power and influence within the school, and thereby threaten the practice of shared instructional leadership. Principals who were exposed to school-based rewards may be experiencing lower engagement because (s)he may believe that individual job performance (good or bad) does not make a difference. Similarly, external rewards distributed to individual teachers may negatively impact principal engagement by making principals feel that (s)he is not an essential part of school success; in other words, principals may feel dispensable.

That monetary rewards were negatively associated with principal behaviors is aligned with existing research on teacher perceptions of monetary reward structures (Bretz & Judge, 1994; Kuhn & Yockey, 2003; Milanowski, 2007). Again, it has been reported that teachers tend to be uncomfortable with the practice of group rewards based on student performance and tend to prefer individual pay-for-performance structures (Milanowski, 2007). Other research has shown that teacher performance pay is associated with higher stress and lack of enthusiasm (Jones, 2013). Extending research on teachers to the findings from this dissertation, it may be that principals do not feel as if (s)he is directly responsible for the performance of a certain group of students and may therefore feel alienated by rewards that are based solely on students' performance.

Exposure to Performance-Based Intervention

The third hypothesis was that exposure to intervention will have a negative association with principal behavior. This hypothesis was moderately supported. Nearly all of the relationships between exposure to interventions and principal behaviors were negative. There

was only one relationship that was positive – the intervention of additional resources and principal engagement – and this coincides with research suggesting that additional resources boost work engagement, particularly in stressful occupations (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Xanthopoulou et al., 2009).

With the exception of additional resources, all interventions had negative relationships with all of the principal behaviors, and three of these relationships were statistically significant. Collectively, the findings demonstrate that there may be a gap in the theory of action of accountability because principals responded negatively, not positively, to interventions. Thus, findings lend support to O'Day's (2002) argument against performance-based accountability systems.

Performance-based interventions may have significant negative relationships with principal behavior for various reasons. Again, external forms of control (in this case, interventions imposed by the state or district due to poor academic performance) are thought to adversely impact the internal structure of an organization (O'Day, 2002; Elmore, 1996). In the case of performance-based interventions, principals who receive the intervention of a school improvement plan undergo a process of being told by external constituents how to improve the school; this may have negative impact on principal engagement because it indicates that the principal's decisions and resource management have thus far not been sufficient. Faced with creating a plan for school improvement, principals may be so focused on creating a plan for success in the future that the day-to-day upkeep of personal relationships and effective leadership is not maintained; these principals may not put support for teachers or staff empowerment as an immediate priority.

Another type of intervention that was examined in this dissertation was evaluation cycle; this intervention involves a state or district setting a specific date by which the school needs to demonstrate specific improvements. In this type of intervention, principal behavior may be adversely affected because timing and content of the evaluation plan are beyond the control of the principal. The certitude of future evaluation and judgment may detract principals from maintaining important social relationships and lead principals to feel less engaged and less sensitive to the needs of teachers. Another possibility is that principals may feel indignant or resentful towards the state or district and have a difficult time buying into the externally-controlled process; the district and states are far removed from the school and should have no "right" to direct principals on means of improvement.

In terms of the school choice intervention, principals in these schools have to publicly admit "failure" to students and parents and openly allow students the option of transfer to a charter school or private school. This intervention forces the principal to admit that the school has not been able to meet the needs of its students which may have deleterious effects on principal morale and leadership. Furthermore, there are financial implications that need to be considered in relation to school choice; when a student leaves a school, the school does not receive the (state or federal) funding dollars for that particular student. For example, in Arizona, students assigned to a failing public school are entitled to 90% of what the district would have received in state funding for each participating student (Arizona Revised Statute 15-2401-152404).

The intervention of supplemental education services may be negatively associated with principal behavior because it indicates that students' needs are not being met by the available

teaching resources in the school. This intervention may be associated with lower engagement and less supportive leadership because principals may not feel that teachers are doing a fair job of meeting the needs of students, and thus offer less support of the teachers; the principals may exhibit less shared instructional leadership because of the lack of trust in teachers' ability to adequately address the learning needs of students in the school.

The intervention of additional resources was negatively related to both supportive leadership and shared instructional leadership. The negative relationship with supportive leadership may be because the principal suddenly has more responsibility to manage the additional resources, thus detracting from the time spent focusing on teachers. The negative relationship with shared instructional leadership may be explained if the additional resources include curricular or instructional materials. For example, it may that schools that do not meet performance goals may be provided with resources in the form of specific curricular materials and teachers may feel stripped of instructional decision-making if a curriculum is implemented or if certain materials are required to be taught. Interestingly, there was also a negative relationship between reduced resources and shared instructional leadership. It may be that in schools where resources are reduced as a result of poor performance, teachers have less access to materials for teaching and instruction and feel that decision-making and influence over instruction is limited.

Overall, interventions for schools where performance goals were not met were negatively related to principal behavior and there are a multitude of potential explanations for these associations. However, it is important to note that these types of interventions are often not coupled with the necessary support and resources from state administration agencies (e.g. Lee,

Shin, & Amo, 2013). Given the appropriate guidance and training, principals and teachers might respond more positively to interventions, however the resources to support reliable implementation of intervention are not in place in most states. This may change under a differentiated (i.e. waiver-based) accountability system because there are less stringent mandates related to intervention and states are given much more flexibility in terms of resource allocation. However, there is already some concern that a more flexible accountability system will do a severe disservice to certain schools; there will likely be schools that could potentially benefit from interventions yet will slip through the cracks because there is no mandate and the resources are being spent elsewhere (Kober & Riddle, 2012).

School Context

There were no directional hypotheses put forth for interactions with school poverty and school size. Table 14 summarizes interactions related to accountability and school size, and Table 15 summarizes findings related to accountability and school poverty. These tables provide summaries of four types of interactions: positive relationships made weaker, positive relationships made stronger, negative relationships made weaker, and negative relationships made stronger.

Turning first to the exploration of state policy for reward and state policy for intervention, for the most part, policy had the same relationship with principal behaviors across schools of varying sizes and poverty levels (see Tables 14 and 15, top row). There were no significant interactions between state policy and school size in predicting any of the principal behaviors (see Table 14). However, the interactions between school poverty and state policy were significant for principal engagement. School poverty was negatively related to principal

engagement, yet the relationship was significantly less strong for schools in states where there was a policy for reward based on performance. The relationship between school poverty and principal engagement, however, was significantly stronger in states where there was a policy for performance-based intervention. In other words, the negative relationship between school poverty and principal engagement (albeit non-significant) was weaker in states where there was policy for performance-based reward and was exacerbated in states where there was policy for performance-based intervention.

School context made almost no difference in the relationships between exposure to rewards and principal behavior (see Tables 14 and 15, second row). As shown in Table 14 (second row), there was only one relationship that changed according to school size; the negative relationships between exposure to monetary reward for schools and principal engagement was stronger in larger schools. All of the other relationships between specific rewards and the three principal behaviors were unaffected by school size. The same was true for the interactions between reward and school poverty; almost all of the relationships between specific rewards and principal behaviors were the same across schools of different poverty levels (see Table 15, second row). The one exception was that the positive relationship between nonmonetary rewards and principal engagement was significantly weaker in higher poverty schools.

Table 14.
Interactions between Accountability and School Size in relation to Principal Engagement (PE), Supportive Leadership (SL), and Shared Instructional Leadership (SIL)

	Positive relationship weaker in larger schools	Positive relationship stronger in larger schools	Negative relationship weaker in larger schools	Negative relationship stronger in larger schools
State policy for reward and/or intervention	No	No	No	No
Exposure to reward	No	No	No	Yes • School reward and PE
Exposure to intervention	No	No	No	Yes • State takeover and SIL

Table 15.
Interactions between Accountability and School Poverty in relation to Principal Engagement (PE), Supportive Leadership (SL), and Shared Instructional Leadership (SIL)

	Positive relationship weaker in higher poverty schools	Positive relationship stronger in higher poverty schools	Negative relationship weaker in higher poverty schools	Negative relationship stronger in higher poverty schools
State policy for reward and/or intervention	No	No	Yes • Reward policy and PE	Yes • Intervention policy and PE
Exposure to reward	Yes • Nonmonetary and PE	No	No	No
Exposure to intervention	No	No	Yes • Supplemental education and SL • School choice and SL	No

School context also made very little difference in the relationships between exposure to intervention and the three principal behaviors. As summarized in Table 14, school size affected only one of the relationships between specific intervention type and principal behavior; specifically, the negative relationship between school takeover and shared instructional leadership was exacerbated in larger schools. The remaining twenty relationships between specific intervention type and each of the three principal behaviors were unaffected by school size. The majority of relationships between intervention type and principal behavior were also unaffected by school poverty. As shown in Table 15, there were only two relationships where there was a significant interaction with school poverty: the relationship between supplemental education services and supportive leadership and the relationship between school choice and supportive leadership. In both cases, the negative relationship were weaker in higher poverty schools. These interventions may have had less impact on supportive leadership in high-poverty schools because these outcomes were already so low in high-poverty schools (i.e. floor effect). Aside from these two interactions, the remaining nineteen relationships between intervention and principal behavior were consistent across schools of different poverty levels.

Overall, there was no consistent pattern of interactions with regard to school size or school poverty in relation to all types of school accountability. For the most part, the relationships between school accountability and principal behaviors were stable across schools of varying sizes and poverty levels.

Limitations

There were various limitations to this study. First, the relationships are not causal and therefore no causal inference may be drawn. A second limitation is that the data is from 2003-04,

over 10 years ago; these relationships should be explored with more current data particularly because the rate of reward and intervention has increased over the past 10 years, as shown in Figure 2. A third limitation was that the data was not collected by the primary researcher so variables that were not included in the dataset could not be modeled. Thus, this study may have omitted variable bias. For example, supplemental information on the reward and/or intervention was not accounted for. Information on the amount of a monetary reward, or the extent to which an intervention was fully implemented and consistently upheld, was not available in the dataset. Other information that was not included in the dataset was direct indication of school urbanicity; this information would have to be derived by classifying schools according to zip code and was therefore not included in the dissertation.

Another limitation was that the principal behaviors that were studied did not undergo a principal components analysis [PCA]. While factor analysis demonstrated that the scales were psychometrically sound, that a PCA was not performed may be considered a limitation.

A fifth limitation was that variables for state policy were drawn from an external source. This was, however, necessary because the information on state policy for rewards and interventions was extremely heterogeneous. Within six states, there was some discrepancy as to whether a state enforced school accountability policy, more specifically educational interventions. For example, in California, 50 out of 71 districts reported to being potentially sanctioned by the state only however 7 districts reported being potentially sanctioned by the district only and 6 districts reported being potentially sanctioned by either the state or the district. All of the responses related to state policy should be the same within a state, yet this was not the case. There were similar discrepancies in the following states: Maryland, Maine, New Jersey,

Oregon, and Texas. There were no such discrepancies related to rewards; all of the districts within states were consistent in responses regarding policy for rewards.

Future Research

There are different segments of research stemming from this dissertation that are important to pursue in the future. First, the relationships that were investigated in this dissertation need to be reexamined with more recent data. Similar models should be re-examined with data from 2008-09 and data from 2012-13. As articulated by Kober and Riddle (2012), the new waiver-based accountability system will provide a resource for exploring different types of policy and there will be opportunities to explore types or variations of policy that are particularly effective.

Beyond the principal behaviors explored in this study, other outcomes need to be investigated, particularly teacher and student outcomes. Principal behavior may play an important role in the relationships between policy and student outcomes. A potential next step in this line of research is to examine how teachers and students are impacted accountability policy and evaluate if principal engagement and leadership mediate these relationships. For example, how do the negative relationships between interventions and principal engagement impact teacher engagement and satisfaction? Are the relationships between accountability policy and student engagement and achievement impacted by principal behavior?

It is also important to examine how incentives such as rewards and interventions impact schools (i.e. principals and teachers) over time. There may be lagged effects of these types of incentives, meaning that a longitudinal design would be necessary. In fact, different analytical

approaches should be explored for example, the latent variable structure for principal-teacher relationships presented by Raudenbush, Rowan, and Kang (1991).

Lastly, it is important to explore more complex context effects associated with the outcomes in this dissertation. School context by student race, classification of size and poverty (e.g. large and high-poverty), and urban-rural-suburban classification should be explored.

Policy Recommendations

Principals are key components in school effectiveness (Jacobson, 2008; Rice, 2010) and the finding that there may be negative relationships between performance-based accountability and principal behaviors is important to consider because it may indirectly impact student outcomes such as engagement or achievement. As discussed at the beginning of this chapter, the U.S. is shifting towards a more differentiated accountability system where states are articulating different plans for achieving outcomes related to student proficiency and college enrollment. Under a differentiated system of accountability (per the states' waiver-based assessment plans), there is more flexibility with regard to incentives and there will be greater variation in the types of incentives used across states. While this new system will provide information on many different approaches, it may also make it more difficult to evaluate effectiveness of incentives because policy and practice will vary from state to state and each accountability system will be very different. Findings from this dissertation therefore provide insight into an accountability system that was relatively more transparent than the one we are transitioning into and may help guide individual state policy.

Looking first at the relationships between state accountability policy and principal behavior, it is clear that principals' awareness and endorsement of accountability policy may be problematic. In terms of awareness, principals need to be knowledgeable about state accountability plans and policy. As demonstrated during the analysis of this dissertation, principals within the same state provided different information on state-level policy. Moreover, principal behavior was negatively related to both reward and intervention policy; principals responded negatively without even experiencing the consequences of state incentives. As leaders, school principals need to buy-in to state policy initiatives and be knowledgeable on current policy and best practices; parents, teachers, and students need to have a leader who is informed and invested in the accountability system. Annual professional development that provides education and background on state-specific policy, hands-on training for data-driven decision-making, and general information/support may be helpful in restoring school leaders' assurance in the state accountability system.

There is no evidence from this dissertation that rewards make a difference in principal behavior. Monetary rewards had both positive and negative associations with principal behavior, and nonmonetary rewards had negligible impact on principal behavior. Rewards also have very little positive impact on student achievement; as shown by Bacolod, DiNardo, & Stevenson (2012), monetary rewards for individual teachers do not have any association with students' standardized achievement. However, it seems that states may still use monetary incentives in the future; for example, New York provides reward schools with an opportunity to "compete for a Commissioner's Schools Dissemination Grant of up to $10,000" (NYSED, 2012). State or district money spent on rewarding schools and teachers may need to be better allocated.

Nonmonetary rewards (i.e. recognition) are more promising, as the associations were all positive (albeit, statistically negligible) and there is no cost.

While interventions are intended to improve school conditions and bolster student performance, findings from this dissertation suggest that performance-based interventions generally have a negative impact on principals. This is consistent with research that shows interventions are negatively associated with student performance in Grade 4 reading and math in New York State (Lee, Shin, & Amo, 2013). This also lends support to O'Day's (2002) research that recommends moving away from performance-based (or bureaucratic) accountability towards professional accountability that emphasizes professional development. Under the revised accountability plans in most waiver states, the number of delivered interventions is significantly reduced because states have more flexibility with resource allocation and are no longer required to intervene in every school that fails to meet AYP. Waiver states are required to identify at least 5% of lowest-performing Title 1 schools as priority schools and at least 10% of lowest-performing Title 1 schools as focus schools. This aspect of waiver-based accountability, however, has already received concern (e.g. Kober & Riddle, 2012) because schools that need help are likely not receiving it (see Hyslop, 2013).

The types of interventions are also changing in the waiver-based accountability system. In New York state, for example, some interventions that were mandated under NCLB such as supplemental educational services have started to phase out while other interventions that were NCLB-mandated such as school choice will remain. Moving forward, it is important that states evaluate the efficacy of these interventions and explore the impact on different outcomes because

if associations of specific interventions are negligible or negative (as is the case with school choice), other interventions should be explored.

Performance-based incentives will likely remain in future accountability systems. Findings from this dissertation tend to suggest that incentives such as rewards and interventions are actually negatively impacting principal engagement and leadership. Anecdotal evidence from several states shows that principals engage in highly immoral behavior when faced with performance-based incentive systems. There is the infamous case of principals and superintendents in the Atlanta Public School district in 2009, where the Georgia Bureau of Investigation found that 44 out of 56 schools cheated on state-administered standardized tests. One-hundred and seventy-eight teachers and principals were found to have changed answers and 35 have been charged with falsifying student answers on standardized tests in order to inflate school performance and stood trial in May 2014. Other cases of principal-led score alteration have been cited in Baltimore (Marbella, 2011), Houston (Mellon, 2013), Denver (Auge & Meyer, 2012), and New York City (New York Daily News, 2013). Kaufmann (2013) made the claim that such immoral acts are directly linked to incentives-based programs such as Race to the Top, as merit-based pay and monetary rewards are tied to strongly to student performance. While this dissertation did not directly explore how accountability incentives are related to acts of principal cheating, findings demonstrated that both state policy and exposure to incentives serve to disengage principals and pull away from leadership policies.

From a general policy perspective, focusing solely on student achievement as an outcome is not the best strategy yet this remains the main focus area in school accountability. In fact, as part of ESEA flexibility, states have to detail a new system for principal and teacher evaluations

that include a student growth component. In other words, performance evaluations of principals and teachers include aspects of student growth and achievement, putting even more emphasis on student achievement. As shown in this dissertation, performance-based incentives are negatively associated with principal behavior and these systems have the potential to promote unintended outcomes (immorality, competition, disengagement, etc.). School accountability that is also focused on student engagement, parental involvement, professional development, and college readiness is a superior approach.

Theoretical Implications

The theory of action of accountability (Smith & O'Day, 1990; O'Day, 2002; Figlio & Ladd, 2007) was not supported in this dissertation. In fact, instead of eliciting productive and/or positive principal behaviors as posited by the theory of action, school accountability was mostly associated with negative principal behaviors. Based on findings from this dissertation, other theories that begin to explain the negative relationships will need to be adapted and empirically tested in the future.

A new theory of accountability should address the different dimensions of accountability such as those that were evaluated in this dissertation, and begin to address the different relationships that emerged. The impact of state policy was very different from that of exposure to incentives. Accountability policy at the state level is fundamentally different than implementation of accountability measures. Furthermore, the term "incentives" is used to refer to both rewards and interventions in the school accountability literature (see Figlio & Ladd, 2007; Figlio & Loeb, 2011). However, findings from this dissertation demonstrate that, at least in terms of exposure, reward and intervention are related to very different principal behaviors. Exposure

to certain rewards was actually positively (although non-significantly) related to principal behaviors while exposure to interventions was almost always negatively related to principal behaviors. A more robust theory of accountability should differentiate between rewards and interventions and also address how exposure to different types of incentives elicits different responses from school leaders.

One theory to consider in light of the findings from this dissertation is the job demands-resources model (Bakker & Demerouti, 2007; Demerouti et al., 2001; Bakker et al., 2007; Schaufeli et al. 2009; Schaufeli & Bakker, 2004). The job demands-resources model posits that there are two simultaneous sources of employee well-being: job demands and job resources. Job demands are aspects of a job that require sustained effort or skill; job resources are aspects of a job that reduce job demands and/or stimulate personal growth, learning, or development. The extent to which job demands and job resources are balanced help to explain organizational well-being (e.g. job strain, or work engagement). Applying this theory to the findings from this dissertation, principals subjected to performance-based accountability, a job demand, may not be provided with the appropriate resources, for example guidance or technical support, and therefore feel less engaged and exhibit poor leadership. In other words, the school principals' job demands are not being sufficiently off-set by the job resources.

The job demands-resource model may also help explain the different relationships that emerged between types of accountability and principal behaviors. In short, some forms of accountability may be considered a burden or job demand (e.g. state policy for reward and/or intervention; exposure to intervention) while other forms of accountability may be considered desirable or a job resource (e.g. nonmonetary rewards and recognition). Recall that there was a

negative relationship between state policy for either reward or intervention and principal behaviors; this type of accountability may be considered a job demand as it puts more responsibility on the principal, thus explaining the negative relationship with principal behaviors. There was a consistent positive relationship between exposure to non-monetary rewards and principal behaviors; this type of accountability may be considered a job resource because it feeds growth and personal fulfillment, thereby explaining the positive relationship with principal behaviors. Exposure to monetary rewards, either school-wide or for individual teachers, were inconsistently related to principal behaviors; this may be because these types of rewards create imbalance of demands and resources, which impacts each principal behavior differently.

Another theory that deserves closer attention in context of the relationships explored herein are principal-agent theories from the economic literature. Principal-agent models are popular in public accountability applications (Gailmard, 2014) and have surfaced in research on labor relations (e.g. Billger, 2007), yet are arguably less popular in educational policy literature. This type of theory recognizes that school leaders (in this case, agents) react to political mandates from the state (in this case, principals), yet that the interpretation of such mandates may be convoluted. In context of this dissertation, school leaders may react to accountability in ways that appease the district or state, even if this is to the detriment of teachers or even students; under performance-based accountability, school principals may be truly motivated to exhibit proficiency even if it is illusory or unsustainable and not at all motivated to create a learning environment that is conducive to teacher and student success.

Moving forward, new theories that address the complex nature of accountability systems need to be adapted or developed. O'Day (2002) effectively analyzed accountability practices

through complex systems theory, and both the job demand-resource model (Bakker & Demerouti, 2007; Demerouti et al., 2001) and principal-agent model discussed above are promising. A theory addressing the intricacies of school accountability – all of its involved parties and all of its unintended effects – is necessary.

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APPENDIX A
STATISTICAL FORMULAE

Research Question One

Fully Conditional Model: Principal Engagement

Level-1 Model

$$Principal\ Behavior_{ij} = \beta_{0j} + \beta_{1j}*(Shared\ Instructional\ Leadership_{ij}) + \beta_{2j}*(\%Female\ Teachers_{ij}) + \beta_{3j}*(\%White\ Teachers) + \beta_{4j}*(\%\ Teachers\ with\ Master's_{ij}) + \beta_{5j}*(\%\ Teachers\ Fully\ Certified_{ij}) + \beta_{6j}*(Supportive\ Leadership_{ij}) + \beta_{7j}*(Years\ Experience_{ij}) + \beta_{8j}*(Salary_{ij}) + \beta_{9j}*(Number\ of\ Vice\ Princpials_{ij}) + \beta_{10j}*(Female_{ij}) + \beta_{11j}*(Hours\ per\ Week\ with\ Students_{ij}) + \beta_{12j}*(Size_{ij}) + \beta_{13j}*(Average\ Daily\ Attendance_{ij}) + \beta_{14j}*(Poverty_{ij}) + r_{ij}$$

Level-2 Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01}*(Northeast_j) + \gamma_{02}*(Midwest_j) + \gamma_{03}*(South_j) + \gamma_{04}*(State\ Policy\ Reward_j) + \gamma_{05}*(State\ Policy\ Intervention_j) + \gamma_{06}*(State\ Control\ over\ Instruction_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$
$$\beta_{2j} = \gamma_{20}$$
$$\beta_{3j} = \gamma_{30}$$
$$\beta_{4j} = \gamma_{40}$$
$$\beta_{5j} = \gamma_{50}$$
$$\beta_{6j} = \gamma_{60}$$
$$\beta_{7j} = \gamma_{70}$$
$$\beta_{8j} = \gamma_{80}$$
$$\beta_{9j} = \gamma_{90}$$
$$\beta_{10j} = \gamma_{100}$$
$$\beta_{11j} = \gamma_{110}$$
$$\beta_{12j} = \gamma_{120}$$
$$\beta_{13j} = \gamma_{130}$$
$$\beta_{14j} = \gamma_{140}$$

The following variables have been centered around the grand mean: *Percentage Female Teachers, Number Vice Principals$_{ij}$ Average Daily Attendance, Percentage White Teachers, Percentage Master'sDegree, Percentage Full Certification, Supportive Leadership, Principal Engagement, Principal Experience, Principal Salary, School Size, Poverty*

Research Question Two

Overall Reward

$\underline{\textit{Principal Behavior}} = \beta_0 + \beta_1*(\%FemaleTeachers) + \beta_2*(\%\ White\ Teachers) + \beta_3*(\%Master'sDegree) + \beta_4*(\%FullCertification) + \beta_{5j}*(Supportive\ Leadership) + \beta_{6j}*(Shared\ Instructional\ Leadership + \beta_7*(Principal\ Experience) + \beta_8*(Principal\ Salary) + \beta_9*(Female) + \beta_{10}*(Average\ Daily\ Attendance) + \beta_{11}*(Number\ Vice\ Principals) + \beta_{12}*(School\ Size) + \beta_{13}*(School\ Poverty) + \beta_{14}*(Hours/Week\ Interacting\ Students) + \beta_{15}*(Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{16}*(Average\ State\ Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{17}*(State\ Poverty) + \beta_{18}*(Northeast) + \beta_{19}*(Midwest) + \beta_{20}*(South) + \beta_{21}*(Overall\ Reward) + r$

Research Question Three

Overall Intervention

$\underline{\textit{Principal Behavior}} = \beta_0 + \beta_1*(\%FemaleTeachers) + \beta_2*(\%\ White\ Teachers) + \beta_3*(\%Master'sDegree) + \beta_4*(\%FullCertification) + \beta_{5j}*(Supportive\ Leadership) + \beta_{6j}*(Shared\ Instructional\ Leadership + \beta_7*(Principal\ Experience) + \beta_8*(Principal\ Salary) + \beta_9*(Female) + \beta_{10}*(Average\ Daily\ Attendance) + \beta_{11}*(Number\ Vice\ Principals) + \beta_{12}*(School\ Size) + \beta_{13}*(Poverty) + \beta_{14}*(Hours/Week\ Interacting\ Students) + \beta_{15}*(Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{16}*(Average\ State\ Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{17}*(State\ Poverty) + \beta_{18}*(Northeast) + \beta_{19}*(Midwest) + \beta_{20}*(South) + \beta_{21}*(Overall\ Intervention) + r$

Research Question Four

State Policy for Reward and /or Intervention and School Size

Fully conditional (slopes-as-outcomes) model

Level-1 Model

$Principal\ Behavior_{ij} = \beta_{0j} + \beta_{1j}*(Shared\ Instructional\ Leadership_{ij}) + \beta_{2j}*(\%Female\ Teachers_{ij}) + \beta_{3j}*(\%White\ Teachers) + \beta_{4j}*(\%\ Teachers\ with\ Master's_{ij}) + \beta_{5j}*(\%\ Teachers\ Fully\ Certified_{ij}) + \beta_{6j}*(Supportive\ Leadership_{ij}) + \beta_{7j}*(Years\ Experience_{ij}) + \beta_{8j}*(Salary_{ij}) + \beta_{9j}*(Number\ of\ Vice\ Princpials_{ij}) + \beta_{10j}*(Female_{ij}) + \beta_{11j}*(Hours\ per\ Week\ with\ Students_{ij}) + \beta_{12j}*(Size_{ij}) + \beta_{13j}*(Average\ Daily\ Attendance_{ij}) + \beta_{14j}*(Poverty_{ij}) + r_{ij}$

Level-2 Model

$\beta_{0j} = \gamma_{00} + \gamma_{01}*(Northeast_j) + \gamma_{02}*(Midwest_j) + \gamma_{03}*(South_j) + \gamma_{04}*(State\ Policy\ Reward_j) + \gamma_{05}*(State\ Policy\ Intervention_j) + \gamma_{06}*(State\ Control\ over\ Instruction_j) + \gamma_{07}(Average\ School\ Size) + u_{0j}$

$\beta_{1j} = \gamma_{10}$

$\beta_{2j} = \gamma_{20}$

$\beta_{3j} = \gamma_{30}$

$\beta_{4j} = \gamma_{40}$

$\beta_{5j} = \gamma_{50}$

$\beta_{6j} = \gamma_{60}$

$\beta_{7j} = \gamma_{70}$

$\beta_{8j} = \gamma_{80}$
$\beta_{9j} = \gamma_{90}$
$\beta_{10j} = \gamma_{100}$
$\beta_{11j} = \gamma_{110}$
$\beta_{12j} = \gamma_{120} + \gamma_{121}(State\ Reward) + \gamma_{122}(State\ Intervention) + u_{12j}$
$\beta_{13j} = \gamma_{130}$
$\beta_{14j} = \gamma_{140}$

For all models, *Size* has been group-mean centered at level-1. All other variables at level-1 were grand-mean centered. *State Control over Instruction* and *Average School Size* were grand-mean centered at level-2.

State Policy for Reward and/or Intervention and School Poverty

Fully Conditional Model
Level-1 Model

$Principal\ Behavior_{ij} = \beta_{0j} + \beta_{1j}*(Shared\ Instructional\ Leadership_{ij}) + \beta_{2j}*(\%Female\ Teachers_{ij}) + \beta_{3j}*(\%White\ Teachers) + \beta_{4j}*(\%\ Teachers\ with\ Master's_{ij}) + \beta_{5j}*(\%\ Teachers\ Fully\ Certified_{ij}) + \beta_{6j}*(Supportive\ Leadership_{ij}) + \beta_{7j}*(Years\ Experience_{ij}) + \beta_{8j}*(Salary_{ij}) + \beta_{9j}*(Number\ of\ Vice\ Princpials_{ij}) + \beta_{10j}*(Female_{ij}) + \beta_{11j}*(Hours\ per\ Week\ with\ Students_{ij}) + \beta_{12j}*(Size_{ij}) + \beta_{13j}*(Average\ Daily\ Attendance_{ij}) + \beta_{14j}*(Poverty_{ij}) + r_{ij}$

Level-2 Model

$\beta_{0j} = \gamma_{00} + \gamma_{01}*(Northeast_j) + \gamma_{02}*(Midwest_j) + \gamma_{03}*(South_j) + \gamma_{04}*(State\ Policy\ Reward_j) + \gamma_{05}*(State\ Policy\ Intervention_j) + \gamma_{06}*(State\ Control\ over\ Instruction_j) + \gamma_{07}(Average\ School\ Poverty) + u_{0j}$

$\beta_{1j} = \gamma_{10}$
$\beta_{2j} = \gamma_{20}$
$\beta_{3j} = \gamma_{30}$
$\beta_{4j} = \gamma_{40}$
$\beta_{5j} = \gamma_{50}$
$\beta_{6j} = \gamma_{60}$
$\beta_{7j} = \gamma_{70}$
$\beta_{8j} = \gamma_{80}$
$\beta_{9j} = \gamma_{90}$
$\beta_{10j} = \gamma_{100}$
$\beta_{11j} = \gamma_{110}$
$\beta_{12j} = \gamma_{120} +$
$\beta_{13j} = \gamma_{130}$
$\beta_{14j} = \gamma_{140} + \gamma_{141}(State\ Reward) + \gamma_{142}(State\ Intervention) + u_{14j}$

For all models, *Poverty* has been group-mean centered at level-1. All other variables at level-1 were grand-mean centered. *State Control over Instruction* and *Average School Poverty* were grand-mean centered at level-2.

Exposure to Reward and School Size

$\underline{Principal\ Behavior} = \beta_0 + \beta_1*(\%FemaleTeachers) + \beta_2*(\%\ White\ Teachers) + \beta_3*(\%Master'sDegree) + \beta_4*(\%FullCertification) + \beta_{5j}*(Supportive\ Leadership) + \beta_{6j}*(Shared\ Instructional\ Leadership + \beta_7*(Principal\ Experience) + \beta_8*(Principal\ Salary) + \beta_9*(Female) + \beta_{10}*(Average\ Daily\ Attendance) + \beta_{11}*(Number\ Vice\ Principals) + \beta_{12}*(School\ Size) + \beta_{13}*(Poverty) + \beta_{14}*(Hours/Week\ Interacting\ Students) + \beta_{15}*(Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{16}*(Average\ State\ Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{17}*(State\ Poverty) + \beta_{18}*\ (Northeast) + \beta_{19}*(Midwest) + \beta_{20}*(South) + \beta_{21}*(Reward) + \beta_{22}*(School\ Size\ X\ Reward) + r$

Exposure to Reward and School Poverty

$\underline{Principal\ Behavior} = \beta_0 + \beta_1*(\%FemaleTeachers) + \beta_2*(\%\ White\ Teachers) + \beta_3*(\%Master'sDegree) + \beta_4*(\%FullCertification) + \beta_{5j}*(Supportive\ Leadership) + \beta_{6j}*(Shared\ Instructional\ Leadership + \beta_7*(Principal\ Experience) + \beta_8*(Principal\ Salary) + \beta_9*(Female) + \beta_{10}*(Average\ Daily\ Attendance) + \beta_{11}*(Number\ Vice\ Principals) + \beta_{12}*(School\ Size) + \beta_{13}*(Poverty) + \beta_{14}*(Hours/Week\ Interacting\ Students) + \beta_{15}*(Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{16}*(Average\ State\ Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{17}*(State\ Poverty) + \beta_{18}*() + \beta_{19}*(School\ Poverty\ X\ Monetary\ Reward\ School) + r$
$\beta_{18}*\ (Northeast) + \beta_{19}*(Midwest) + \beta_{20}*(South) + \beta_{21}*(\ Reward) + \beta_{22}*(\ School\ Poverty\ X\ Reward) + r$

Exposure to Intervention and School Size

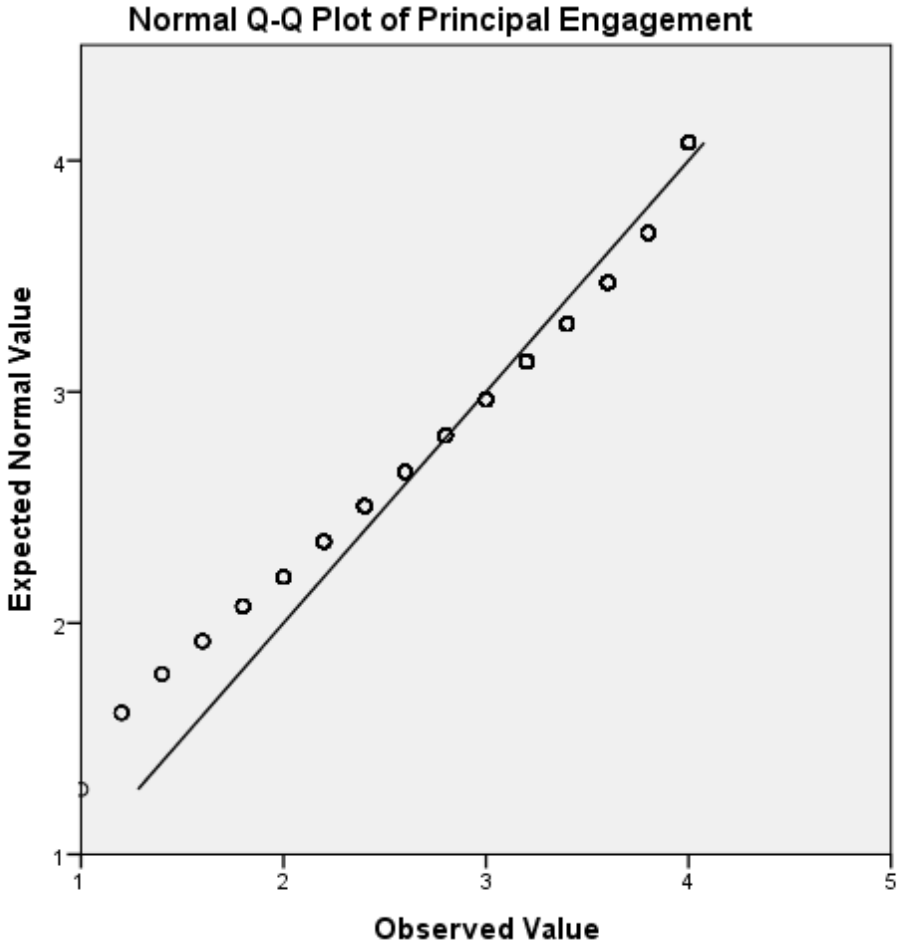
$\underline{Principal\ Behavior} = \beta_0 + \beta_1*(\%FemaleTeachers) + \beta_2*(\%\ White\ Teachers) + \beta_3*(\%Master'sDegree) + \beta_4*(\%FullCertification) + \beta_{5j}*(Supportive\ Leadership) + \beta_{6j}*(Shared\ Instructional\ Leadership + \beta_7*(Principal\ Experience) + \beta_8*(Principal\ Salary) + \beta_9*(Female) + \beta_{10}*(Average\ Daily\ Attendance) + \beta_{11}*(Number\ Vice\ Principals) + \beta_{12}*(School\ Size) + \beta_{13}*(Poverty) + \beta_{14}*(Hours/Week\ Interacting\ Students) + \beta_{15}*(Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{16}*(Average\ State\ Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{17}*(State\ Poverty) + \beta_{18}*\ (Northeast) + \beta_{19}*(Midwest) + \beta_{20}*(South) + \beta_{21}*(Intervention) + \beta_{22}*(School\ Size\ X\ Intervention) + r$

Exposure to Intervention and School Poverty

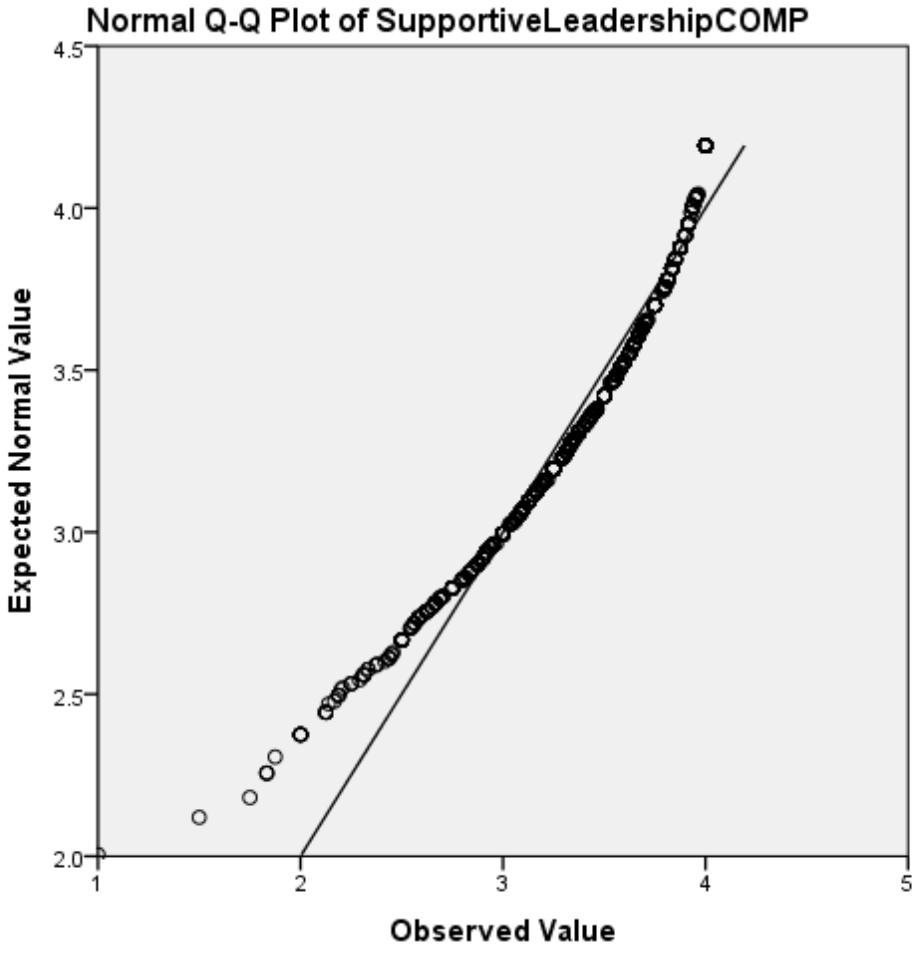
$\underline{Principal\ Behavior} = \beta_0 + \beta_1*(\%FemaleTeachers) + \beta_2*(\%\ White\ Teachers) + \beta_3*(\%Master'sDegree) + \beta_4*(\%FullCertification) + \beta_{5j}*(Supportive\ Leadership) + \beta_{6j}*(Shared\ Instructional\ Leadership + \beta_7*(Principal\ Experience) + \beta_8*(Principal\ Salary) + \beta_9*(Female) + \beta_{10}*(Average\ Daily\ Attendance) + \beta_{11}*(Number\ Vice\ Principals) + \beta_{12}*(School\ Size) + \beta_{13}*(Poverty) + \beta_{14}*(Hours/Week\ Interacting\ Students) + \beta_{15}*(Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{16}*(Average\ State\ Principal\ Perception\ of\ State\ Influence\ over\ Instruction) + \beta_{17}*(State\ Poverty) + \beta_{18}*\ (Northeast) + \beta_{19}*(Midwest) + \beta_{20}*(South) + \beta_{21}*(Intervention) + \beta_{22}*(School\ Poverty\ X\ Intervention) + r$

APPENDIX B
NORMALITY OF DEPENDENT VARIABLES

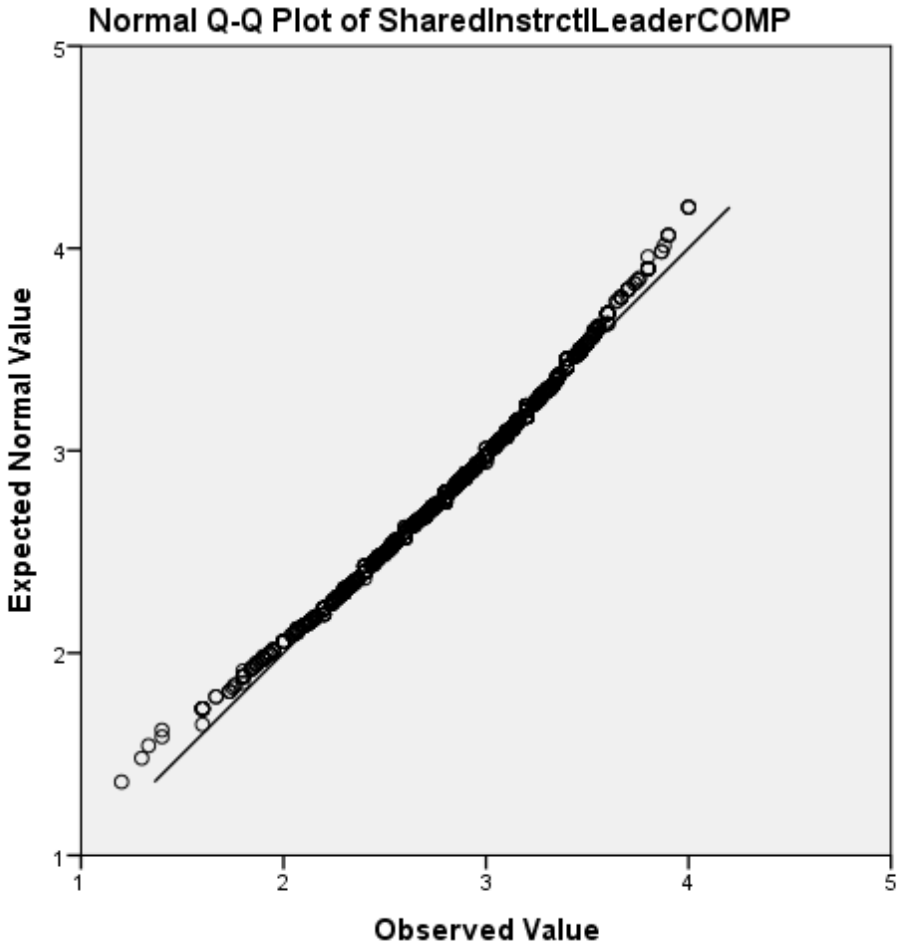
Principal Engagement



Supportive Leadership



Shared Instructional Leadership



APPENDIX C
PARAMETER ESTIMATES WITH AND WITHOUT OTHER PRINCIPAL BEHAVIORS AS PREDICTORS

Research Question One

	Principal engagement		Supportive leadership		Shared instructional Leadership	
	With other DV as Covariates	Without other DV as covariates	With other DV as Covariates	Without other DV as covariates	With other DV as Covariates	Without other DV as covariates
State Reward Policy	-.0611	-.067*	-.054*	-.066*	-.014	-.033
State Intervention Policy	-.0793*	-.084*	-.019	-.055	-.108	-.124

Research Question Two

	Principal engagement		Supportive leadership		Shared instructional Leadership	
	With other DV as Covariates	Without other DV as covariates	With other DV as Covariates	Without other DV as covariates	With other DV as Covariates	Without other DV as covariates
Overall Reward	.008	.009	.065***	.077***	.016*	.038***

Research Question Three

	Principal engagement		Supportive leadership		Shared instructional leadership	
	With other DV as Covariates	Without other DV as covariates	With other DV as Covariates	Without other DV as covariates	With other DV as Covariates	Without other DV as covariates
Overall intervention	-.036***	-.046***	-.044***	-.07***	-.091***	-.105***

APPENDIX D
CORRELATION MATRICES

Table D1.
Correlations for Research Question 1

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Shared Instructional Leadership	1	.011	.253**	-.046	-.118**	-.152**	-.287**	-.018	.102**	.019	-.113**	-.172**	.007	-.022
2	Principal Engagement	.011	1	.082**	.014	-.094**	-.023	-.114**	.131**	-.029	-.054	-.032	-.014	.030	.024
3	Supportive Leadership	.253**	.082**	1	-.006	-.132**	-.032	-.063*	-.040	-.022	.056	-.003	-.007	-.003	.029
4	State Control over Curriculum	-.046	.014	-.006	1	.064**	.111**	-.013	.022	-.065*	.134**	-.106**	-.002	.094**	.030
5	School Poverty	-.118**	-.094**	-.132**	.064**	1	.173**	.270**	-.242**	-.123**	.285**	.030	.021	-.007	.007
6	State Reward Policy	-.152**	-.023	-.032	.111**	.173**	1	.138**	-.120**	-.152**	.162**	.088**	.104**	-.010	.006
7	State Intervention Policy	-.287**	-.114**	-.063*	-.013	.270**	.138**	1	-.026	-.057	.031	.049	.051	-.023	.008
8	Northeast	-.018	.131**	-.040	.022	-.242**	-.120**	-.026	1	-.281**	-.343**	-.251**	-.058	-.009	-.052
9	Midwest	.102**	-.029	-.022	-.065*	-.123**	-.152**	-.057	-.281**	1	-.423**	-.310**	-.156**	.079**	-.023
10	South	.019	-.054	.056	.134**	.285**	.162**	.031	-.343**	-.423**	1	-.377**	.068*	.044	.142**
11	West	-.113**	-.032	-.003	-.106**	.030	.088**	.049	-.251**	-.310**	-.377**	1	.142**	-.126**	-.090**
12	School Size	-.172**	-.014	-.007	-.002	.021	.104**	.051	-.058	-.156**	.068*	.142**	1	-.022	.020
13	Average Daily Attendance	.007	.030	-.003	.094**	-.007	-.010	-.023	-.009	.079**	.044	-.126**	-.022	1	.028
14	%Female teachers	-.022	.024	.029	.030	.007	.006	.008	-.052	-.023	.142**	-.090**	.020	.028	1
15	%White teachers	.081**	.059*	.109**	-.006	-.301**	-.171**	-.180**	.112**	.160**	-.112**	-.145**	-.157**	-.027	.040
16	%Master's teachers	.045	.042	.036	-.021	-.100**	-.039	-.005	.185**	.089**	-.160**	-.084**	-.014	-.026	-.047
17	% Certified teachers	.022	-.028	.090**	.006	-.081**	.010	.054	-.035	-.040	.073*	-.009	-.039	.019	.194**
18	Years Experience	.050*	.014	-.029	.011	-.099**	.064*	-.118**	.014	.098**	-.071*	-.036	-.021	.005	-.002
19	Salary	-.190**	.104**	-.012	.015	-.155**	.011	.056	.299**	-.025	-.380**	.182**	.316**	.030	-.058*
20	Number of vice principals	-.140**	.019	-.021	.050*	.210**	.096**	.066*	-.098**	-.192**	.347**	-.102**	.561**	.023	.015
21	Female	-.056*	.020	.020	.116**	.108**	.047	.052	-.016	-.136**	.101**	.043	.033	-.006	.055*
22	Wkly hrs interact students	-.054*	.039	.039	-.016	.141**	.024	.064*	.018	-.042	.108**	-.097**	-.016	-.002	-.005

* Correlation is significant at $p < .05$
** Correlation is significant at $p < .01$

Table D1. (cont'd)

		15	16	17	18	19	20	21	22
1	Shared Instructional Leadership	.081**	.045	.022	.050*	-.190**	-.140**	-.056*	-.054*
2	Principal Engagement	.059*	.042	-.028	.014	.104**	.019	.020	.039
3	Supportive Leadership	.109**	.036	.090**	-.029	-.012	-.021	.020	.039
4	State Control over Curriculum	-.006	-.021	.006	.011	.015	.050*	.116**	-.016
5	School Poverty	-.301**	-.100**	-.081**	-.099**	-.155**	.210**	.108**	.141**
6	State Reward Policy	-.171**	-.039	.010	.064*	.011	.096**	.047	.024
7	State Intervention Policy	-.180**	-.005	.054	-.118**	.056	.066*	.052	.064*
8	Northeast	.112**	.185**	-.035	.014	.299**	-.098**	-.016	.018
9	Midwest	.160**	.089**	-.040	.098**	-.025	-.192**	-.136**	-.042
10	South	-.112**	-.160**	.073*	-.071*	-.380**	.347**	.101**	.108**
11	West	-.145**	-.084**	-.009	-.036	.182**	-.102**	.043	-.097**
12	School Size	-.157**	-.014	-.039	-.021	.316**	.561**	.033	-.016
13	Average Daily Attendance	-.027	-.026	.019	.005	.030	.023	-.006	-.002
14	%Female teachers	.040	-.047	.194**	-.002	-.058*	.015	.055*	-.005
15	%White teachers	1	.044	.163**	.043	-.130**	-.210**	-.065**	-.109**
16	%Master's teachers	.044	1	.051*	-.028	.148**	-.063**	.036	-.008
17	% Certified teachers	.163**	.051*	1	.107**	-.071**	-.099**	-.023	-.099**
18	Years Experience	.043	-.028	.107**	1	.176**	-.060*	-.296**	-.034
19	Salary	-.130**	.148**	-.071**	.176**	1	.152**	-.014	-.059*
20	Number of vice principals	-.210**	-.063**	-.099**	-.060*	.152**	1	.093**	.003
21	Female	-.065**	.036	-.023	-.296**	-.014	.093**	1	.013
22	Wkly hrs interact students	-.109**	-.008	-.099**	-.034	-.059*	.003	.013	1

* Correlation is significant at $p < .05$

** Correlation is significant at $p < .01$

Table D2.
Correlations for Research Question 2

		1	2	3	4	5	6	7	8	9	10	11
1	Principal Engagement	1	-.012	.039	-.106**	-.024	-.110**	-.081**	.005	.012	.020	.160**
2	Shared Instructional Leadership	-.012	1	.277**	-.056	-.018	-.050	.016	-.008	-.163**	.008	.009
3	Supportive Leadership	.039	.277**	1	-.134**	.070*	.053	.026	.039	.020	-.036	.013
4	School poverty	-.106**	-.056	-.134**	1	.068*	.109**	.085**	.073*	-.020	.018	-.213**
5	OverallReward	-.024	-.018	.070*	.068*	1	.493**	.515**	.852**	.099**	-.066*	-.212**
6	MonetarySchool	-.110**	-.050	.053	.109**	.493**	1	.718**	.221**	.169**	-.018	-.163**
7	MonetaryTeacher	-.081**	.016	.026	.085**	.515**	.718**	1	.270**	.178**	-.090**	-.172**
8	NonMonetary	.005	-.008	.039	.073*	.852**	.221**	.270**	1	.045	-.025	-.158**
9	School size	.012	-.163**	.020	-.020	.099**	.169**	.178**	.045	1	-.027	-.082**
10	Average daily attendance	.020	.008	-.036	.018	-.066*	-.018	-.090**	-.025	-.027	1	.030
11	Northeast	.160**	.009	.013	-.213**	-.212**	-.163**	-.172**	-.158**	-.082**	.030	1
12	Midwest	-.017	.105**	-.032	-.166**	-.139**	-.142**	-.190**	-.083**	-.166**	.074*	-.218**
13	South	-.046	-.002	.055	.242**	.195**	.290**	.327**	.112**	.136**	.016	-.338**
14	West	-.065*	-.103**	-.042	.060	.087**	-.058	-.047	.083**	.071*	-.112**	-.247**
15	%Female teachers	-.016	-.049	.003	.005	.030	.086**	.072*	.007	.070*	.035	-.064*
16	%White teachers	.070*	.094**	.153**	-.230**	-.141**	-.093**	-.055	-.127**	-.153**	-.023	.068*
17	%Master's teachers	.072*	.041	.036	-.148**	-.107**	-.115**	-.148**	-.069*	.016	-.032	.220**
18	% Certified teachers	-.050	-.010	.053	-.031	-.046	-.048	-.084**	-.038	-.015	.052	.000
19	Years' experience	-.003	.043	-.030	-.016	.034	.047	.031	.040	-.008	.004	-.019
20	Salary	.134**	-.219**	-.018	-.168**	-.039	-.035	-.066*	-.010	.273**	.031	.276**
21	Number of vice principals	.047	-.103**	.001	.200**	.095**	.215**	.204**	.063*	.517**	-.003	-.128**
22	Female	.038	-.042	.048	.072*	.015	-.014	-.005	.010	.033	.017	-.013
23	Hours/week interact students	.035	-.033	.053	.104**	.067*	.049	.021	.054	.004	-.006	-.022
24	State Control over Curriculum	.046	-.042	-.023	.096**	.120**	.047	.081**	.085**	.019	.009	.073*

* Correlation is significant at $p < .05$
** Correlation is significant at $p < .01$

Table D2. (cont'd)

		12	13	14	15	16	17	18	19	20	21	22	23	24
1	Principal Engagement	-.017	-.046	-.065*	-.016	.070*	.072*	-.050	-.003	.134**	.047	.038	.035	.046
2	Shared Instructional Leadership	.105**	-.002	-.103**	-.049	.094**	.041	-.010	.043	-.219**	-.103**	-.042	-.033	-.042
3	Supportive Leadership	-.032	.055	-.042	.003	.153**	.036	.053	-.030	-.018	.001	.048	.053	-.023
4	School poverty	-.166**	.242**	.060	.005	-.230**	-.148**	-.031	-.016	-.168**	.200**	.072*	.104**	.096**
5	OverallReward	-.139**	.195**	.087**	.030	-.141**	-.107**	-.046	.034	-.039	.095**	.015	.067*	.120**
6	MonetarySchool	-.142**	.290**	-.058	.086**	-.093**	-.115**	-.048	.047	-.035	.215**	-.014	.049	.047
7	MonetaryTeacher	-.190**	.327**	-.047	.072*	-.055	-.148**	-.084**	.031	-.066*	.204**	-.005	.021	.081**
8	NonMonetary	-.083**	.112**	.083**	.007	-.127**	-.069*	-.038	.040	-.010	.063*	.010	.054	.085**
9	School size	-.166**	.136**	.071*	.070*	-.153**	.016	-.015	-.008	.273**	.517**	.033	.004	.019
10	Average daily attendance	.074*	.016	-.112**	.035	-.023	-.032	.052	.004	.031	-.003	.017	-.006	.009
11	Northeast	-.218**	-.338**	-.247**	-.064*	.068*	.220**	.000	-.019	.276**	-.128**	-.013	-.022	.073*
12	Midwest	1	-.407**	-.298**	-.050	.183**	.129**	.024	.098**	-.018	-.197**	-.058	-.092**	-.140**
13	South	-.407**	1	-.461**	.146**	-.085**	-.213**	.005	-.014	-.317**	.409**	.052	.173**	.125**
14	West	-.298**	-.461**	1	-.064*	-.133**	-.063*	-.029	-.061	.144**	-.169**	.007	-.089**	-.070*
15	%Female teachers	-.050	.146**	-.064*	1	.041	-.061	.218**	-.033	-.031	.042	.055	-.002	-.018
16	%White teachers	.183**	-.085**	-.133**	.041	1	.037	.179**	.029	-.169**	-.245**	-.067*	-.105**	-.037
17	%Master's teachers	.129**	-.213**	-.063*	-.061	.037	1	.043	-.016	.179**	-.080*	.052	-.037	-.023
18	% Certified teachers	.024	.005	-.029	.218**	.179**	.043	1	.074*	-.031	-.109**	.002	-.090**	-.015
19	Years' experience	.098**	-.014	-.061	-.033	.029	-.016	.074*	1	.187**	-.055	-.320**	-.029	.017
20	Salary	-.018	-.317**	.144**	-.031	-.169**	.179**	-.031	.187**	1	.100**	-.020	-.133**	.031
21	Number of vice principals	-.197**	.409**	-.169**	.042	-.245**	-.080*	-.109**	-.055	.100**	1	.102**	.015	.056
22	Female	-.058	.052	.007	.055	-.067*	.052	.002	-.320**	-.020	.102**	1	.021	.124**
23	Hours/week interact students	-.092**	.173**	-.089**	-.002	-.105**	-.037	-.090**	-.029	-.133**	.015	.021	1	-.043
24	State Control over Curriculum	-.140**	.125**	-.070*	-.018	-.037	-.023	-.015	.017	.031	.056	.124**	-.043	1

* Correlation is significant at $p < .05$

** Correlation is significant at $p < .01$

Table D3
Correlations for Research Question 3

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Northeast	1	-.285**	-.296**	-.216**	-.009	.088*	.116**	-.137**	-.030	.302**	.076*	-.015	.101**
2	Midwest	-.285**	1	-.432**	-.321**	-.007	.164**	.124**	-.013	.110**	.006	-.232**	-.131**	.001
3	South	-.296**	-.432**	1	-.333**	.150**	-.199**	-.081*	.140**	-.068	-.361**	.154**	.154**	.015
4	West	-.216**	-.321**	-.333**	1	-.135**	-.020	-.190**	.001	-.007	.113**	-.004	-.038	-.104**
5	%Female teachers	-.009	-.007	.150**	-.135**	1	.038	-.022	.160**	.052	-.106**	-.031	.055	-.010
6	%White teachers	.088*	.164**	-.199**	-.020	.038	1	.059	.136**	.043	-.118**	-.163**	-.042	-.107**
7	%Master's teachers	.116**	.124**	-.081*	-.190**	-.022	.059	1	.066	-.047	.100**	-.033	.007	.032
8	% Certified teachers	-.137**	-.013	.140**	.001	.160**	.136**	.066	1	.145**	-.155**	-.082*	-.051	-.103**
9	Years' experience	-.030	.110**	-.068	-.007	.052	.043	-.047	.145**	1	.140**	-.068	-.241**	-.030
10	Salary	.302**	.006	-.361**	.113**	-.106**	-.118**	.100**	-.155**	.140**	1	.248**	.015	.063
11	Number of vice principals	.076*	-.232**	.154**	-.004	-.031	-.163**	-.033	-.082*	-.068	.248**	1	.076*	-.018
12	Female	-.015	-.131**	.154**	-.038	.055	-.042	.007	-.051	-.241**	.015	.076*	1	-.010
13	Hours/week interact students	.101**	.001	.015	-.104**	-.010	-.107**	.032	-.103**	-.030	.063	-.018	-.010	1
14	School size	.026	-.236**	.000	.205**	-.071	-.181**	-.066	-.088*	-.058	.387**	.647**	.044	-.039
15	Average daily attendance	-.014	-.011	.110**	-.087*	.015	-.039	-.012	-.038	.005	.027	.072	-.050	.005
16	School poverty	-.097*	-.212**	.256**	.004	.013	-.353**	-.044	-.117**	-.184**	-.065	.237**	.126**	.162**
17	State Control over Curriculum	.001	-.063	.199**	-.172**	.103**	.036	-.019	.038	.002	-.010	.041	.101**	.016
18	OverallIntervention	.032	-.107**	.081*	.017	.005	-.119**	-.028	-.090*	-.089*	.071	.109**	.091*	.051
19	RequirePlan	.026	-.093*	.104**	-.010	.034	-.039	-.044	.002	-.055	.010	.060	.044	.093*
20	EvaluationCycle	-.047	-.088*	.086*	.027	-.008	-.043	-.072	-.005	-.079*	-.067	.096*	.006	-.011
21	AddResource	.011	-.093*	.110**	-.057	.053	-.081*	-.038	-.049	-.045	.077*	.209**	.048	.019
22	ReduceResource	-.097**	.002	.034	.044	.027	-.137**	-.049	-.035	.048	.008	-.004	-.083*	.060
23	ReconTakeOver	-.052	-.015	.050	.004	-.013	-.125**	-.065	-.077*	.056	.114**	.075*	.015	-.053
24	FreeSES	.132**	-.127**	-.010	.016	.009	-.148**	-.099**	-.118**	-.083*	.137**	.135**	.035	.059
25	FreeChoice	.090*	-.112**	-.085*	.124**	-.095*	-.114**	-.078*	.004	-.060	.091*	.138**	-.016	.096*
26	Shared instructional leadership	-.008	.091*	-.029	-.055	.014	.042	.058	.049	.038	-.181**	-.196**	-.056	-.068
27	Supportive leadership	-.100**	.020	.060	.000	.066	.031	.040	.124**	-.047	-.030	-.053	-.005	.033
28	Principal engagement	.095*	.010	-.067	-.029	.091*	.036	-.007	.000	.032	.037	-.023	-.001	.050

Table D3. (cont'd)

		14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	Northeast	.026	-.014	-.097*	.001	.032	.026	-.047	.011	-.097**	-.052	.132**	.090*	-.008	-.100**	.095*
2	Midwest	-.236**	-.011	-.212**	-.063	-.107**	-.093*	-.088*	-.093*	.002	-.015	-.127**	-.112**	.091*	.020	.010
3	South	.000	.110**	.256**	.199**	.081*	.104**	.086*	.110**	.034	.050	-.010	-.085*	-.029	.060	-.067
4	West	.205**	-.087*	.004	-.172**	.017	-.010	.027	-.057	.044	.004	.016	.124**	-.055	.000	-.029
5	%Female teachers	-.071	.015	.013	.103**	.005	.034	-.008	.053	.027	-.013	.009	-.095*	.014	.066	.091*
6	%White teachers	-.181**	-.039	-.353**	.036	-.119**	-.039	-.043	-.081*	-.137**	-.125**	-.148**	-.114**	.042	.031	.036
7	%Master's teachers	-.066	-.012	-.044	-.019	-.028	-.044	-.072	-.038	-.049	-.065	-.099**	-.078*	.058	.040	-.007
8	% Certified teachers	-.088*	-.038	-.117**	.038	-.090*	.002	-.005	-.049	-.035	-.077*	-.118**	.004	.049	.124**	.000
9	Years' experience	-.058	.005	-.184**	.002	-.089*	-.055	-.079*	-.045	.048	.056	-.083*	-.060	.038	-.047	.032
10	Salary	.387**	.027	-.065	-.010	.071	.010	-.067	.077*	.008	.114**	.137**	.091*	-.181**	-.030	.037
11	Number of vice principals	.647**	.072	.237**	.041	.109**	.060	.096*	.209**	-.004	.075*	.135**	.138**	-.196**	-.053	-.023
12	Female	.044	-.050	.126**	.101**	.091*	.044	.006	.048	-.083*	.015	.035	-.016	-.056	-.005	-.001
13	Hours/week interact students	-.039	.005	.162**	.016	.051	.093*	-.011	.019	.060	-.053	.059	.096*	-.068	.033	.050
14	School size	1	-.014	.143**	-.037	.089*	.014	.036	.073	.009	.092*	.076*	.129**	-.209**	-.070	-.072
15	Average daily attendance	-.014	1	-.044	.248**	.014	-.035	.021	.004	.049	.029	.022	-.041	.002	.053	.047
16	School poverty	.143**	-.044	1	.014	.180**	.179**	.255**	.145**	.078*	.091*	.195**	.219**	-.139**	-.069	-.046
17	State Control over Curriculum	-.037	.248**	.014	1	.018	.083*	.085*	.071	.003	.034	.036	-.009	-.051	.020	-.034
18	OverallIntervention	.089*	.014	.180**	.018	1	.669**	.389**	.559**	.138**	.122**	.325**	.315**	-.142**	-.088*	-.061
19	RequirePlan	.014	-.035	.179**	.083*	.669**	1	.404**	.290**	.124**	.132**	.257**	.259**	-.091*	-.051	-.075*
20	EvaluationCycle	.036	.021	.255**	.085*	.389**	.404**	1	.198**	.198**	.197**	.288**	.341**	-.067	-.096*	-.070
21	AddResource	.073	.004	.145**	.071	.559**	.290**	.198**	1	.024	.061	.279**	.219**	-.125**	-.041	.026
22	ReduceResource	.009	.049	.078*	.003	.138**	.124**	.198**	.024	1	.115**	.138**	.113**	-.107**	-.021	-.013
23	ReconTakeOver	.092*	.029	.091*	.034	.122**	.132**	.197**	.061	.115**	1	.322**	.315**	-.064	-.072	-.119**
24	FreeSES	.076*	.022	.195**	.036	.325**	.257**	.288**	.279**	.138**	.322**	1	.599**	-.190**	-.080*	-.018
25	FreeChoice	.129**	-.041	.219**	-.009	.315**	.259**	.341**	.219**	.113**	.315**	.599**	1	-.226**	-.084*	-.059
26	Shared instructional leadership	-.209**	.002	-.139**	-.051	-.142**	-.091*	-.067	-.125**	-.107**	-.064	-.190**	-.226**	1	.198**	.035
27	Supportive leadership	-.070	.053	-.069	.020	-.088*	-.051	-.096*	-.041	-.021	-.072	-.080*	-.084*	.198**	1	.139**
28	Principal engagement	-.072	.047	-.046	-.034	-.061	-.075*	-.070	.026	-.013	-.119**	-.018	-.059	.035	.139**	1

APPENDIX E
STATE POLICY INFORMATION FROM EPE DATA 2002-2004

	2002		2003		2004	
	Intervention	Reward	Intervention	Reward	Intervention	Reward
Alabama	Yes	Yes	Yes	Yes	No	Yes
Alaska	No	No	No	No	No	No
Arizona	No	No	No	No	Yes	No
Arkansas	No	No	Yes	Yes	Yes	Yes
California	No	Yes	Yes	Yes	Yes	No
Colorado	Yes	Yes	Yes	Yes	Yes	No
Connecticut	No	No	Yes	No	No	No
Delaware	No	Yes	No	Yes	No	No
Florida	Yes	Yes	Yes	Yes	Yes	Yes
Georgia	No	Yes	No	Yes	Yes	Yes
Hawaii	No	No	No	No	Yes	No
Idaho	No	No	No	No	No	Yes
Illinois	Yes	No	No	No	Yes	No
Indiana	Yes	Yes	No	Yes	Yes	Yes
Iowa	No	No	No	No	No	No
Kansas	No	No	No	No	No	No
Kentucky	Yes	Yes	Yes	Yes	Yes	Yes
Louisiana	Yes	Yes	Yes	Yes	Yes	Yes
Maine	No	No	No	No	No	No
Maryland	Yes	Yes	Yes	Yes	Yes	Yes
Massachusetts	Yes	No	Yes	No	Yes	No
Michigan	No	Yes	No	No	Yes	No
Minnesota	No	No	No	No	No	No
Mississippi	No	No	No	No	Yes	Yes
Missouri	Yes	No	Yes	No	Yes	No
Montana	No	No	No	No	No	No
Nebraska	No	No	No	No	No	No
Nevada	Yes	No	Yes	No	Yes	No
New Hampshire	No	No	No	No	No	No
New Jersey	No	Yes	No	No	No	No
New Mexico	No	Yes	Yes	Yes	Yes	Yes
New York	Yes	No	Yes	No	Yes	No

	2002		2003		2004	
	Intervention	Reward	Intervention	Reward	Intervention	Reward
North Carolina	Yes	Yes	Yes	Yes	Yes	Yes
North Dakota	No	No	No	No	No	No
Ohio	No	No	No	No	Yes	No
Oklahoma	Yes	No	Yes	Yes	Yes	Yes
Oregon	No	No	No	No	No	No
Pennsylvania	No	Yes	No	Yes	No	Yes
Rhode Island	Yes	No	Yes	No	No	No
South Carolina	Yes	Yes	Yes	Yes	Yes	Yes
South Dakota	No	No	No	No	No	No
Tennessee	Yes	Yes	Yes	Yes	Yes	Yes
Texas	Yes	Yes	Yes	No	Yes	No
Utah	No	No	No	No	No	No
Vermont	Yes	No	Yes	No	Yes	No
Virginia	No	No	No	No	No	No
Washington	No	No	No	No	No	No
West Virginia	Yes	No	Yes	No	Yes	No
Wisconsin	No	No	No	No	No	No
Wyoming	No	No	No	No	No	No
U.S.	20	18	23	17	27	16