

HIGH SCHOOL PRINCIPAL TRANSFORMATIONAL LEADERSHIP BEHAVIORS
AND TEACHER EXTRA EFFORT DURING EDUCATIONAL REFORM:
THE MEDIATING ROLE OF TEACHER AGENCY BELIEFS

by

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ABSTRACT

HIGH SCHOOL PRINCIPAL TRANSFORMATIONAL LEADERSHIP BEHAVIORS AND TEACHER EXTRA EFFORT DURING EDUCATIONAL REFORM: THE MEDIATING ROLE OF TEACHER AGENCY BELIEFS

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Transformational leadership has been shown to predict organizational commitment, capacity development, and performance. However, these relationships have received very little attention in schools, especially high schools in the United States that are experiencing educational reform initiatives under No Child Left Behind. Using a sample of 1403 high school teachers from 12 Texas urban and major suburban independent school districts, this study tested the relationships between teacher perceived school-based transformational leadership, self-reported teacher agency beliefs, and self-reported school-wide teacher extra effort. The teacher agency beliefs included capability

beliefs about collective teacher efficacy and context beliefs about the supportive nature of school rules and hierarchical authority. Results revealed moderate to strong positive associations between all of the major study variables. Additionally, SEM analysis revealed that transformational leadership and teacher agency beliefs explained a significant amount of teacher differences in perceived school-wide extra effort. SEM also revealed that teacher agency beliefs mediated most of the effects of transformational leadership behaviors on teacher extra effort. Specifically, collective teacher efficacy played a central role in the relationships, mediating all of the positive effects of context beliefs and a vast majority of the effects of transformational leadership behaviors. Findings also suggest that the leadership dimensions exhibited significant multicollinearity, making it difficult to compare the effects of different types of leadership behaviors. Implications of these findings as well as recommendations for further research are discussed.

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CHAPTER 1

INTRODUCTION

The No Child Left Behind Act (NCLB) of 2001 engages high schools throughout the United States in a national reform movement that emphasizes college- and career-readiness (Dee & Jacob, 2010; Koretz, 2008). As a result, schools in the United States have faced widespread, fluctuating reform initiatives for more than a decade that require school leaders to increase the capacity and commitment of their teachers (Hallinger, 2005; Hamilton, Stecher, & Yuan, 2008; Heilig & Darling-Hammond, 2008). Recent reauthorizations of NCLB have sharpened its focus on college-readiness, holding principals responsible for a broader range of school interventions (Dee & Jacob, 2010) even though principals wield little direct influence over student learning (Hallinger & Heck, 1996, 1999; Leithwood, 2007; Ross & Gray, 2006b), especially in high schools (Witziers, Bosker, & Kruger, 2003).

Despite these on-going reform efforts, a significant number of public high-school graduates in the United States remain unprepared to succeed in higher education (Boser & Burd, 2009; Bradley & Blanco, 2010). In fact, as many as 60% of all first-year college students are required to take at least one remedial class (National Center for Public Policy and Higher Education, 2010), and only one third of those students will earn college degrees (Wiley, Wyatt, & Camara, 2010). Moreover, while the percentage of African American and Hispanic college students is expected to increase substantially over the next decade, these students tend to be significantly less prepared to succeed in college

(ACT, 2011; Roderick, Nagaoka, & Coca, 2009; Wiley et al., 2010). In Texas alone, while just under a third of all seniors in public schools were college ready in math and reading during the 2006-2007 school year, the proportion fell to approximately one fifth of Hispanic and African American seniors (Moore et al., 2010).

Given the current gap in college readiness and projected enrollment trends, the continued failure of reform initiatives associated with NCLB threatens students' college-readiness well into the future. This risk is especially acute for traditionally underserved populations who rely most heavily on their K-12 experiences to prepare them for college (Farmer-Hinton, 2008; Holland & Farmer-Hinton, 2009; Venezia & Krist, 2005) and who are more likely to experience inequities in teacher capacities (Hill, 2007). Even though efficacious reform efforts to align the K-16 programs for all students rely heavily on teachers' capacities and commitment to change, high-stakes accountability measures tend to undermine teacher satisfaction and motivation, especially in underperforming schools (Finnigan & Gross, 2007; Hursh, 2005). Thus, the success of current reforms requires research-based evaluation of principal leadership behaviors that develop teacher motivation and commitment to student learning under the pressures of such reform (Leithwood, Jantzi, & Mascal, 2002). Such teacher development is especially crucial because student perceptions of learning tend to reflect their teachers' motivation (Butler, 2007; Butler & Shibaz, 2008; Kunter et al., 2008).

Transformational leadership (TL) appears most suited theoretically to meet the need to increase teacher capacity and commitment during restructuring initiatives (Geijsel & Meijers, 2005; Leithwood, 1994; Yukl, 2006). As first articulated by Burns (1978), TL reflects a leader's efforts to mobilize organizational talents and resources by appealing to

common goals and values that raise organizational members “to higher levels of motivation and morality” (p. 382). In addition to motivating by rewards, such leaders work even harder to transmute their followers’ personal interests and goals into a shared vision for the future, resulting in increased effort and higher productivity (Leithwood & Jantzi, 2009). Although not all teachers consider teaching a mission, teaching still remains connected with higher purposes that outweigh material forms of motivation for many teachers (Brookhart & Freeman, 1992; Freedman & Appleman, 2009; Margolis & Deuel, 2009; Ng & Peter, 2010; Santoro, 2011). Thus, principals who appeal to teachers’ shared values and goals should be more effective than those who merely rely on a system of rewards and punishments.

Much of the current theory regarding the effectiveness of TL in schools originated with Leithwood’s analysis of changes in approaches to school reform. Leithwood (1994) argued that compared to the reform agenda of the 1970s and 1980s, the current reform agenda relies on tremendous flexibility. Whereas the control-oriented approach of the 1980s reflected the belief that “student achievement can be improved by routinization of the schools’ core technology through strengthening of the schools’ bureaucratic controls” (Geisjel & Meijers, 2005, p. 421), current efforts to meet the needs of the rapidly changing environment—including demographic, technological, and job-force revolutions—require flexibility and innovation. Accordingly, these uncertain times call for increased commitment and capacity instead of control (Geijsel & Meijers, 2005; Leithwood, 1994). Additionally, Leithwood (1994) claimed that a significant part of the failure of earlier educational reform efforts stemmed from their inability to sustain instructional changes after their implementation. Sustained outcomes in the classroom require favorable school

conditions, and these “second-order changes require a form of leadership that is sensitive to organization building: developing shared vision, creating productive work cultures, distributing leadership to others, and the like” (p. 501). Finally, according to Leithwood (1994), the current reform has shifted definitively to secondary schools whose larger size, curricular complexity, and pedagogical diversity strain control strategies, like direct teacher supervision.

Recent empirical studies of TL in schools have revealed promising preliminary results consistent with the theory. In a series of studies in Canadian schools undergoing restructuring, Leithwood and Jantzi found that TL behaviors significantly affected school conditions and student engagement (1998, 1999, 2000) as well as teachers’ self-efficacy beliefs and classroom practices (2006a). Additionally, in a Hong Kong study, Yu, Leithwood, and Jantzi (2002) found that TL positively affected school conditions and the teachers’ commitment to change while Geijsel, Slegers, Leithwood, and Jantzi (2003) reported that TL predicted higher levels of teacher commitment to school values and partnerships in a large-scale study of teachers in Canada and the Netherlands. Finally, in two rare TL studies conducted in United States schools, Griffith (2004) and Valentine and Prater (2011) showed that TL positively affected student achievement.

Despite the growing appeal of TL in schools (Leithwood & Jantzi, 2009; Leithwood & Slegers, 2006; Mulford, Silins, & Leithwood, 2004), much of the faith in TL has arisen from decades of research in non-school environments (Avolio & Bass, 2004; Bass & Riggio, 2006). This dearth of empirical research on school leadership, especially TL, provides very few insights into how leadership affects school conditions, teachers, and students (Leithwood & Jantzi, 2009; Leithwood & Slegers, 2006). In fact,

because most of the existing school-based leadership studies have focused on school conditions and student outcomes, much less is known about how such leadership affects teachers (Geisjel et al., 2003). As Leithwood and Jantzi (2006b) conclude, this lack of empirical evidence jeopardizes reform initiatives that rely on local implementation.

Because theorists claim that TL encourages organizational members to exceed expectations without additional reward (Bass, 1985; Burns, 1978; Leithwood, 1994), the real test of TL in schools is whether it stimulates teacher extra effort related to student achievement. Accordingly, in response to a principal's inspirational focus on common values and goals, teachers should engage in organizational citizenship behaviors (OCBs)—employee behaviors that support the organization, but are not directly required for task performance. As a reflection of increased commitment, such extra effort is vital for effective organizations (Borman & Motowidlo, 1993; Organ, 1997; Smith, Organ, & Near, 1983). Katz and Kahn (1966) considered these “actions not specified by role prescriptions but which facilitate the accomplishment of organizational goals” so essential that the “system would break down” without them (pp. 338-339). Non-school studies have shown that these extra-role behaviors are associated with enhanced organizational (Koys, 2001), team (Dunlop & Lee, 2004), and individual (MacKenzie, Podsakoff, & Fetter, 1993) performance; improved retail service quality (Bell & Menguc, 2002); increased job satisfaction (Bateman & Organ, 1983; Williams & Anderson, 1991); and higher self-efficacy beliefs (Liu, Siu, & Shi, 2010).

Despite the promising research on extra effort in businesses, only a few studies have examined the benefits of extra effort within the school context even though the behaviors for effective teaching cannot be captured by mere contractual arrangements or

even detailed job descriptions (DiPaola & Tschannen-Moran, 2001). As organizations “concerned with the molding of people rather than the transformation of objects,” effective educational institutions rely heavily on teachers’ discretionary behaviors that cannot be exhaustively prescribed (Katz & Kahn, 1966, p. 132) because they rely on “deeper motivational processes” (p. 122). Limited research in schools has revealed positive relationships between teacher extra effort and job satisfaction (Somech & Drach-Zahavy, 2000), teachers’ perceptions of organizational justice (Yilmaz & Tasdan, 2009), and student achievement in both mathematics and reading (DiPaola & Hoy, 2005).

Both intuition and research suggest that the effects of TL on teacher extra effort are facilitated through changes in intervening school factors, such as decision-making processes, and teacher characteristics, such as a sense of empowerment (Griffith, 2004; Leithwood & Jantzi, 2006a). In non-school settings, for instance, Podsakoff, MacKenzie, Moorman, and Fetter (1990) reported that trust in leadership facilitated the relationship between TL and extra effort. Because school leadership has predominantly indirect effects on school outcomes, especially student learning (Hallinger & Heck, 1996; Leithwood, 2007), exploring the mechanisms by which local leadership affects teacher motivation and behavior is paramount to the success of reform efforts to improve all students’ college readiness (Hallinger, 2011).

According to social cognitive theory, individuals are motivated to act in part because of their beliefs about the effectiveness of their agency in a given context (Bandura, 1986, 1993). These agency beliefs—consisting of confidence in one’s capabilities and in the support of one’s environment—provide individuals with information they need to pursue their goals (Ford, 1992). A few school-based studies

have begun to examine elements of the relationship between principal leadership, teacher agency, and teacher behaviors. Focusing on the leadership side of the relationship, recent school-based studies have demonstrated the positive relationship between principal TL and teacher capability beliefs (Demir, 2008; Hipp & Bredeson, 1995). At the other end of the relationship, a few studies have revealed that these efficacy beliefs are positively related to teacher extra effort (Bogler & Somech, 2005; Somech & Drach-Zahavy, 2000). Additionally, Ross and Gray (2006a) found teachers' efficacy beliefs facilitated the relationship between TL behaviors and teacher commitment to organizational values. Nevertheless, none of these studies has examined the full relationship between specific principal behaviors, teacher agency beliefs, and teacher extra effort, especially in the United States.

By connecting individual values to broader institutional goals and sense of mission, principal TL purportedly promotes the increased teacher capacity and commitment necessary for the success of current reform initiatives. Nevertheless, school-based studies, especially those in the United States and in high schools, have only begun to explore the relationship between specific principal TL behaviors, teacher agency beliefs, and teacher extra effort. In order to improve the college readiness of high school graduates in the United States, principals need to understand how specific leadership behaviors, most notably those related to TL, affect teacher agency beliefs, which, in turn, promote increased commitment in the form of extra effort.

Statement of the Problem

Despite the potential of TL to meet the demands of current reform efforts in the United States, very little TL research has been conducted in schools, especially in United

States schools. Although some studies indicate that TL behaviors in schools predict favorable school conditions and student outcomes, much more needs to be known about the underlying processes that connect these leadership behaviors to student learning outcomes. Most notably, very few studies address how TL behaviors affect teacher behaviors that promote student learning. Exploring the relationships between specific principal leadership behaviors, teacher agency beliefs, and teacher extra effort will benefit the development of a research-based theory and practice of leadership that transforms underperforming high schools. Such evidence is needed to help policy makers and school leaders allocate scarce resources and recruit and train principals and teachers to help all students achieve college- and career-readiness.

Purpose of the Study

The purpose of this study was to assess how specific principal TL behaviors motivate teachers to put forth extra effort during times of educational reform. To that end, the study examined how specific principal TL behaviors are related to and predict teacher agency beliefs and teacher extra effort, focusing more specifically on the role teacher agency beliefs play in mediating the relationship. By including school variables such as socioeconomic status (SES), minority enrollment, and prior achievement on high-stakes tests, the study also evaluated how school context affects these relationships.

Research Questions and Hypotheses

The study addresses the following three broad research questions:

Question 1 How are the specific types of perceived principal TL behaviors—*setting directions, developing people, redesigning the organization*, and

improving instruction—related to one another and to the components of self-reported teacher agency beliefs and perceived school-wide teacher extra effort under conditions of high-stakes accountability?

Question 2 How are teacher characteristics such as age and experience and school characteristics such as school SES, percentage of minority students, and past master experiences related to perceived principal TL behaviors, self-reported teacher agency beliefs, and perceived school-wide teacher extra effort?

Question 3 To what extent do the principal TL behaviors and teacher and school characteristics account for individual differences in self-reported teacher agency beliefs and perceived school-wide teacher extra effort?

The following hypotheses emerge from the literature in relation to the research questions. The first set of hypotheses related to Question 1 addresses the associations between the major study variables. Both theory and empirical research suggest that transformational leadership behaviors are positively associated with collective teacher efficacy beliefs (Demir, 2008; Leithwood, Patten, and Jantzi, 2010; Ross & Gray, 2006a, 2006b) and teachers' beliefs about their supportive context (Eyal & Roth, 2011; Korkmaz, 2007; Vecchio, Justin, & Pearce, 2008). In general, social cognitive theory predicts that these teacher agency beliefs will be positively associated with goal-oriented behaviors. Additionally, several studies have indicated that instructional leadership has

greater associations with *collective teacher efficacy* (Coldren & Spillane, 2007; Wahlstrom & Louis, 2008) and with *extra effort towards students* (Robinson, Lloyd, & Rowe, (2008).

Hypothesis 1. All four types of perceived principal TL behaviors—*setting directions*, *developing people*, *redesigning the organization*, and *improving instruction*—are positively and significantly correlated with both intervening teacher agency variables—*collective efficacy beliefs* and *context beliefs*—and with perceived school-wide teacher *extra effort*.

Hypothesis 1a. Behaviors related to *redesigning the organization* are more strongly correlated with teachers' self-reported *context beliefs* than are the other three types of leadership behaviors.

Hypothesis 1b. Behaviors related to *improving instruction* are more strongly correlated with self-reported *collective efficacy beliefs* and perceived teacher *extra effort towards students* than are the other TL behaviors.

Hypothesis 1c. Teacher agency beliefs are positively and significantly correlated with each other and with perceived school-wide teacher *extra effort*.

The second set of hypotheses related to Question 2 addresses additional associations between the major study variables and the exogenous school characteristics. Consistent with social cognitive theory's explanation of the four major sources of efficacy or capability beliefs, several studies have found that *past mastery* has positive influences on *collective teacher efficacy* (Cybulski, Hoy, & Sweetland, 2005; Goddard & Skrla, 2006). Although student achievement directly determines *past mastery* ratings, these ratings also serve to categorize the entire school and the associated teachers' effectiveness. Given the strong correlation between academic achievement and high SES, it is not surprising that studies have found a significant, negative correlation between *lower SES* and *past mastery* (Cybulski et al., 2005). Thus, *lower SES* should also be negatively correlated with the teacher agency beliefs that are positively correlated with *past mastery*. Finally, given the high proportion of *lower SES* schools with high proportions of minority students, the *percentage of minority students* should be negatively correlated with the predicted variables, especially without controlling for SES (see Appendix A for definitions).

Hypothesis 2. The exogenous variables (i.e., *lower SES*, *percentage of minority students*, and *past mastery*) have significant associations with the major study variables.

Hypothesis 2a. A school's *lower SES* and *percentage of minority students* are significantly and negatively associated with teacher

agency beliefs and perceived school-wide teacher *extra effort*.

Hypothesis 2b. *Past mastery* experience on high-stakes tests is significantly and positively associated with teacher agency beliefs and perceived school-wide teacher *extra effort*.

The final set of hypotheses related to Question 3 addresses the nature of the relationships in the explanatory model and ascertains the degree to which the major study variables and exogenous school characteristics explain individual differences in school-wide *extra effort*.

Hypothesis 3. The perceived transformational leadership behaviors and the exogenous school characteristics account for a significant amount of variance in self-reported teacher agency beliefs and perceived school-wide teacher *extra effort*.

The following hypothesis related to Question 3 addresses the mediating role of the two teacher agency beliefs. As posited by social cognitive theory, the mediating role of teacher agency beliefs between principal leadership and teacher action is supported by several studies. Geijsel et al. (2003) found that teacher agency beliefs mediated the relationship between TL and teachers' willingness to participate in decision-making activities and professional development opportunities. Eyal and Roth (2011) and

Walumbwa, Wang, Lawler, & Shi (2004) found that the effects of TL were at least partially mediated by *context beliefs*.

Hypothesis 3a. The two variables associated with teacher agency beliefs mediate the effects of transformational leadership on perceived school-wide teacher *extra effort*.

In support of the next two hypotheses about the importance of *context beliefs*, Giejsel et al. (2003) and Yu et al. (2002) found that TL had greater effects on *context beliefs* than on capacity beliefs, suggesting that TL behaviors work more directly through their effects on *context beliefs*. Leithwood and Jantzi (2006) also found that TL had the greatest effects on beliefs about the *work setting*, which measured how supported teachers felt by their school environment. Giejsel et al. (2003) added the arc from *context beliefs* to *collective teacher efficacy* as a result of model fit modifications. They found that *context beliefs* mediated the relationship between TL and CTE, especially when teachers' classroom practices were the dependent variable. Other studies have confirmed the relationship between *context beliefs* and CTE (Adams & Forsyth, 2006; McGuigan & Hoy, 2006; Wu, Hoy, & Tarter, 2013).

Hypothesis 3b. Teacher *context beliefs* mediate the effects of TL on *collective teacher efficacy*.

Hypothesis 3c. TL behaviors have greater direct effects on *context beliefs* than they do on *collective teacher efficacy beliefs*.

Finally, as mentioned above, several studies have indicated that instructional leadership has greater associations with *collective teacher efficacy* (Coldren & Spillane, 2007; Wahlstrom & Louis, 2008) and with *extra effort towards students* (Robinson, Lloyd, & Rowe, (2008).

Hypothesis 3d. Behaviors related to *improving instruction* have greater direct effects on *collective teacher efficacy beliefs* and greater overall effects on *extra effort towards students* than do the behaviors related to *setting directions, developing people, or redesigning the organization*.

Finally, the last two hypotheses related to Question 3 address the effects of the exogenous school characteristics on teacher *extra effort*. A school's *lower SES* has been shown to be associated with low CTE (Cybulski et al., 2005; Hoy, Sweetland, & Smith, 2002). Although the largely unexplored associations between minority student composition and teacher agency have been mixed, the sample's high proportion of *lower SES* schools with high minority concentrations suggests that these two factors will be similarly related to *past mastery* and thus teacher agency beliefs. According to social cognitive theory, *past mastery* experiences are one of the four primary sources of efficacy beliefs, and efficacy beliefs are one of the key motivational factors in determining goal-

directed behavior (Bandura, 1997). Several studies have demonstrated that *past mastery* is positively associated with teacher efficacy beliefs (Cybulski et al., 2005; Goddard, Hoy, & Hoy, 2000; Goddard & Skrla, 2006).

Hypothesis 3e. *Lower SES and the percentage of minority students have significant, negative effects on teacher agency beliefs and teacher extra effort.*

Hypothesis 3f. *Past mastery experiences on high-stakes tests have significant, positive effects on teacher agency beliefs and teacher extra effort.*

Significance of the Study

This study strengthens the understanding of how principal leadership, especially TL behaviors, affects teacher agency beliefs and extra effort during educational reform initiatives. Moreover, instead of evaluating the general applicability of TL to schools, this study examines how specific TL behaviors of the principal affect teacher agency beliefs and extra effort. By focusing on how TL relates to teacher extra effort, this study is the first study in the United States to actually assess the claim that TL behaviors encourage high school teachers to go beyond expectations.

In addition to exploring the effects of specific principal TL behaviors on teacher extra effort, this study is the first in the United States to examine how teacher agency beliefs—their collective efficacy and context beliefs—influence that relationship. While a handful of studies have examined either teachers' efficacy or context beliefs, very few

have combined these two components of teacher agency. By including these intermediary teacher beliefs, this study helps explain the psychological mechanisms by which leadership behaviors transform into teacher action.

The results of the study not only guide future research, but also provide concrete guidance for policy makers and site-based school leaders who face limited resources and high-stakes demands to improve school effectiveness. Understanding how specific principal TL behaviors influence teacher agency beliefs and their extra effort is essential to successful restructuring initiatives aimed at K-16 alignment and postsecondary success. Furthermore, a better understanding of how the specific types of TL behaviors influence teachers will help school leaders, as well as state and federal policymakers, design effective employee policies and training that promote capacity and commitment in their teachers without requiring inordinate expenditures of scarce resources.

The following chapter provides a review of the literature associated with transformational leadership in schools, teacher agency beliefs, and teacher extra effort. Each major sub-section begins with an introduction to the theoretical basis of the research and then presents findings related to schools. After the review, Chapter 3 presents the current study's methods, including information about participants, data collection, research design, and statistical procedures used to test the study's hypotheses. The penultimate chapter presents the major statistical findings that are discussed in Chapter 5, which concludes with the study's limitations and a number of recommendations for future research. Finally, Appendix A offers definitions of key terms, Appendix B provides a copy of the email invitation to teachers, and Appendices B-E offer background information on each of the study's scales.

CHAPTER 2

REVIEW OF THE LITERATURE

The following literature review examines school-based research on the three organizational factors of concern: the principal's transformational leadership, teacher agency beliefs, and teacher extra effort. Each sub-section begins with a brief overview of the major theory underlying the selection of the factor followed by an account of seminal and recent studies relevant to this study's focus. Research over the past 15 years on these evolving school-based concepts provides promising guidance for effective schools. Nevertheless, very few of the studies have isolated the effects of particular leadership behaviors on teacher beliefs and practices. Moreover, outside of the research on teacher agency, only a handful of these studies have been conducted in the U.S. or in high schools.

Transformational Leadership

Transformational leadership (TL) appears best suited to meet the needs of current school reform because such leaders seek to align personal and shared values and goals to bring about increased capacity and commitment. Several researchers have attributed the origins of the concept of TL to Downton (1973) (Hater & Bass, 1988; Silins, 1994). In his analysis of the leadership of rebels, Downton contrasted three bases of commitment: transactional, charismatic, and inspirational. Transactional relations "are developed on the basis of trust and stabilized through the existence of mutual benefits that accrue as the

result of the exchange of tangible rewards” for obedience and threats of punishments for disobedience (p. 75). In the case of charismatic relations, the leader’s authority is “legitimized by the leader’s association, directly or through a charismatic office, with a *manifestly* transcendental authority” (p. 77). As Weber (1978) maintained, the charismatic leader’s personal authority arises from his “actual revelation or grace resting in such a person as a savior, a prophet, or a hero” (p. 954). Such leaders’ followers “surrender to the extraordinary” (p. 954) embodied in the leader or the leader’s office during times of “collective excitement produced by extraordinary events” that are unstable and short-lived (p. 1121). Finally, according to Downton (1973), the inspirational relationship is based on a shared world-view for which the leader serves as a “representative model of all followers” (p. 79), exceptional only in her ability to inspire others. Instead of being psychologically dependent on the leader as the source or representative of transcendent values, the followers as well as the leader are committed to the same social philosophy, independent of a particular leader or office.

Although Downton may have been the first to emphasize types of leadership relations based on commitments that were not transactional, Burns (1978) was the first to articulate the concept of transforming leadership, which has heavily influenced the modern concept of TL (Yukl, 2006). While Burns defined leadership as “inducing followers to act for certain goals that represent the values and motivations—the wants and needs, the aspirations and expectations—of both leaders and followers” (p. 19), he claimed that leadership varied based on two essentially different forms of interaction. Transactional leaders engage followers for the purpose of exchanging valued economic, political, or psychological goods. Beyond this exchange, the leader and followers have

“no enduring purpose that holds them together . . . in a mutual and continuing pursuit of a higher purpose” (p. 20). Transforming leaders, on the other hand, engage followers “in such a way that leaders and followers raise one another to higher levels of motivation and morality” (p. 20). Such leaders motivate followers to achieve outcomes beyond expectations by illuminating the importance of the organizational outcomes, moving followers beyond their self-interests, or recasting their apparent needs as collective goals (Bass, 1985; Hater & Bass, 1988).

The most empirically researched version of TL is indebted to Bass and Avolio’s (Avolio, 1999; Bass and Avolio, 1985; Bass 1985, 1997) formulation of a multi-dimensional behavioral construct, measured by the Multifactor Leadership Questionnaire (MLQ). While the original construct included three types of transformational behaviors, the most recent version has undergone two waves of revision and now includes five components of TL: *inspirational motivation*, *intellectual stimulation*, *individualized consideration*, and two forms of *idealized influence*—one behavioral and the other attributed. *Inspirational motivation* reflects leaders’ behaviors that motivate members. Such leaders provide meaning and challenge to their members’ work, arouse spirit, display enthusiasm and optimism, and promote attractive future visions of the organization that include all members. Behaviors that promote *intellectual stimulation* encourage members to be innovative and creative, allowing them to question assumptions, reframe problems, and consider new approaches to old problems. Complementing these two general types of behaviors, *individual consideration* indicates the degree to which the leader acts as a coach or mentor to individual members of the organization, promoting growth and development in a supportive environment that

recognizes individual differences. Finally, leaders who demonstrate confidence and a sense of purpose wield a degree of *idealized influence* or charisma. *Behavioral idealized influence* refers to specific behaviors that reflect the leader's values, beliefs, and goals, while *attributed idealized influence* reflects how members perceive the effects of the leader's charisma. Together these five types of behaviors define a leader who is able to connect with members of the organization both on an individual level and through the organization's mission by empowering the members to participate in defining the future of the organization in a collegial atmosphere. According to Bass and Avolio's model, transactional forms of motivation can complement these TL behaviors although the two forms can exist independently (Avolio, Bass, Jung, 1999).

Negative Consequences of Transformational Leadership

Compared to the enthusiasm about the potential benefits of transformational leadership, very few studies have examined its potential negative consequences (Parry & Bryman, 2006; Yukl, 2006), especially in schools. Focusing on manipulative forms of TL, a few leadership theorists and researchers have argued that these inauthentic forms of transformational leadership arise when leaders use motivational techniques that are either detached from their actual behavior or that are self-centered (Barling, Christie, & Turner, 2008; Bass & Steidlmeier, 1999; Khoo & Burch, 2008). A few non-school studies, however, have indicated that even authentic, ethical forms of transformational leadership can negatively affect innovation and independence by fostering dependence on the leader (Eisenbiess & Boerner, 2013; Ishikawa, 2012; Pieterse, van Knippenberg, Schippers, and Stam, 2010).

A few studies have sought to distinguish authentic transformational leadership from inauthentic forms categorized as pseudo-transformational leadership. Barling et al. (2008) defined *pseudo-transformational leadership* as leadership that combines *inspirational motivation* with self-centered *idealized influence*. Instead of focusing on a truly collective mission, these leaders use their communication and motivational skills to inspire followers' towards the leaders' own self-serving goals. As a result, such leaders often instill fear and dependence through abusive forms of supervision. In their study of 611 Canadian business managers, Barling et al. (2008) reported that this combination of low *idealized influence* and high *inspirational motivation* was "associated with higher perceptions of fear, obedience, dependence, perceptions of abusive supervision, and job insecurity by followers" (p. 858). Similarly, Khoo and Burch (2008) found that behaviors related to *idealized influence* were associated with Bold scores on the Hogan Development Survey (HDS), an inventory of dysfunctional organizational behaviors that tend to threaten reputations, undermine relationships, and wreck careers. Such Bold leaders have a tendency to overestimate their own capabilities and exhibit an air of entitlement that weakens their ability to sustain relationships and adapt. Furthermore, in their study of 80 executives in New Zealand, Colorful behaviors on the HDS served as the strongest predictor of overall TL behaviors. Prone to dramatic forms of expression, Colorful leaders exhibit weak interpersonal and team-building skills because of their need to be at the center of attention (Khoo & Burch, 2008). These findings suggest that pseudo-transformational leaders can employ their motivational skills to serve their own interests, thus perverting the communal aims of transformative leadership.

In addition to these studies that point to potential exploitations of TL, several international business studies have shown that even authentic forms of TL can dampen followers' creativity and innovation by fostering dependence on the leader. Surveying 654 workers in 119 R&D industrial research teams, Ishikawa (2012) found that transformational leadership had a negative effect on shared leadership through its effects on the norm for maintaining consensus. By reinforcing these norms, transformational leadership impeded autonomous thinking and leadership development in the Japanese sample. Pieterse et al. (2010) reported very similar results in their sample of 230 governmental employees in the Netherlands. They determined that psychological empowerment moderated the relationship between TL and the followers' innovative behavior. Similar to self-efficacy beliefs, psychological empowerment reflects followers' beliefs in their abilities to "influence their jobs and work environments in meaningful ways, facilitating proactive behavior, showing initiative, and acting independently" (p. 613). TL was positively related to innovative behaviors only in those followers who reported higher levels of psychological empowerment. Thus, only those individuals who felt more competent and autonomous were more likely to be inspired by transformational leaders to engage in innovative behaviors. One possible explanation for the diminished leadership development and innovative behaviors in followers is that TL behaviors tend to promote dependency. In a study of 416 R&D employees in 11 international companies, TL appeared to increase worker dependence on the leader, which reduced worker creativity even though TL had a direct positive effect on worker creativity (Eisenbiess & Boerner, 2013). As a result, TL's association with followers' dependency on the leader significantly reduced TL's overall positive effects on followers' creativity.

By examining other psychological mediators, a few studies have helped to explain how TL behaviors can result in such disparate outcomes. In a study of 888 Israeli bankers and their 76 branch managers, Kark, Shamir, and Chen (2003) demonstrated that TL behaviors foster both dependence and empowerment by working through two different types of identification. While personal identification with the leader mediated the effects of TL on dependence, social identification with the work mediated the effects of TL on empowerment. Thus, the very same behaviors can foster apparently disparate outcomes depending on other factors such as the context or perhaps the stage of the leader-follower relationship. Depending on how the followers view the nature of their work in relation to their leaders, TL behaviors can foster empowerment or dependence. More recently, Zhu, Newman, Miao, and Hooke (2013) corroborated these findings by showing how different types of trust mediated the relationship between the leader's TL behaviors and workers' commitment and extra effort. Examining 318 supervisor-worker dyads in one large Chinese garment firm, Zhu et al. (2013) found that affective trust and not cognitive trust mediated the relationship between TL and positive organizational outcomes. Affective trust reflects mutual feelings of concern and care that can result in greater levels of cooperation. Cognitive trust, on the other hand, reflects the follower's appraisal of the leader's personal abilities that can increase the follower's dependence on the leader. These two studies reveal the fine line between leaders who generate communal, shared experiences through TL behaviors and those who emphasize their own personal roles through very similar behaviors.

Two school-based studies that examined leadership and empowerment shed light on the possibility of conflicting outcomes. Examining the effects of leadership style on

140 teams in 140 Israeli elementary schools, Somech (2005a) found that a directive leadership style was associated with increases in organizational commitment and in-role performance towards established goals while a participatory leadership style was associated with individual empowerment that facilitated problem-solving and innovation. Although directive behaviors (i.e., monitoring, evaluation, and control) motivated teachers towards predetermined goals, collaboration and involvement in decision-making associated with the participatory style of leadership motivated teachers to take initiative in an on-going, open-ended process. Although Somech (2005a) maintained that the two styles could be balanced, emphasizing one style at the expense of the other could result in conflicting results. Somech (2005b) found very similar trade-offs in an examination of two types of empowerment (i.e., *personal empowerment* and *team empowerment*) in a sample of 2,400 Israeli teachers in 25 middle and 27 high schools. In the study, personal empowerment was associated with self-actualization needs of the individual, and team empowerment was associated with the social-psychological needs met through collaboration and interaction. Once again, Somech (2005b) found that although the two types of empowerment could be maintained simultaneously, they also interacted in various contexts. As the constraints of the team increased, personal empowerment suffered because of a lack of autonomy. Combined, these two school-based studies suggest that as leaders become more directive, establishing shared goals and vision through monitoring, evaluation and control, they run the risk of undermining autonomy and personal teaching efficacy in the name of collective teacher efficacy.

This limited body of research into the negative consequences of authentic and inauthentic variations of transformational leadership suggests that TL could have

negative effects on collective teacher efficacy, especially under high accountability conditions. While even authentic forms of TL could promote dependence on leaders instead of greater confidence in colleagues, abusive supervisory techniques and self-centered motivations associated with inauthentic forms of TL could undermine a shared feeling of confidence in the teachers' abilities to achieve their shared mission. Furthermore, the work of Somech (2005a, 2005b) reveals that even though leaders can balance individual and group outcomes, such as the two forms of empowerment and efficacy, these complementary outcomes can also work against each other when leaders use participatory methods under highly directive contexts.

Transformational Leadership in Schools

Leithwood and colleagues combined a series of grounded qualitative studies with a series of quantitative studies to test and modify the MLQ for the school context (Leithwood, 1994). As a result, their original composite TL construct has developed into a multi-dimensional construct, omitting transactional practices either because they lacked positive effects or because they merged with transformational practices. In this regard, Leithwood's construct reflects Burns' (1978) theory more than Avolio and Bass's (1988) with transactional and transformational practices appearing to be more contrary than complementary.

These ground-breaking studies in school-based TL confirmed seven leadership behaviors whose effects vary according to the specific context, yet require simultaneous attention. In general, *vision building* and *fostering commitment to group goals* accounted for most of the variance in school outcomes followed by *individualized support* and *intellectual stimulation*, which Leithwood (1994) maintained could be modified to reflect

an instructional focus. *Contingent rewards* and *high-performance expectations* appeared to be the most context driven, sometimes having negative effects when commitment was already high. The construct also included *providing appropriate models* of behaviors based on espoused values. All of the dimensions except *high-performance expectations* reflected all five of the elements of Avolio and Bass's (1988) model of TL measured by the MLQ.

Based on the results of several follow-up studies (Leithwood, 2012; Leithwood & Jantzi, 1999, 2000, 2006a), Leithwood and his colleagues have trimmed and reclassified the initial seven dimensions into four clusters: *setting directions*, *developing people*, *redesigning the organization*, and *improving the instructional program*. The first two school-based leadership behaviors mirror the major TL behaviors measured by the MLQ. *Setting directions* behaviors include goal-setting actions associated with *inspirational motivation* coupled with modeling behaviors associated with *idealized influence*. Similarly, *developing people* activities include supportive behaviors associated with *individualized consideration* coupled with actions associated with *intellectual stimulation* aimed at innovation. Additionally, behaviors associated with *redesigning the organization* encourage collaboration and participatory decision-making related to restructuring of schools. Finally, leadership behaviors related to *improving the instructional program* adapt transformational behaviors to specific monitoring and support of classroom instruction—the core technology of schools.

School-based studies of transformational leadership. Over the past two decades, while school-based studies of TL have worked to adapt business models of TL, most notably the MLQ, to the school setting, they have also begun to explore the

relationships between TL behaviors, intervening factors, and school outcomes. This section of the review begins with studies that explored the relationship between TL and student outcomes. These studies show that TL affects student engagement and achievement indirectly by first affecting school factors conducive to learning. Additional studies have uncovered the positive association between TL behaviors and teacher commitment to change and changes in classroom instruction during times of educational reform. Combined this limited body of research, conducted predominantly outside of the United States and primarily in the lower grades, reveals that TL behaviors appear to affect student outcomes through their direct effects on teacher commitment and practice.

Transformational leadership and student outcomes. A handful of studies have examined the relationship between TL and favorable student outcomes, most notably student engagement and student academic achievement. As expected, these studies have confirmed that TL behaviors contribute positively to student outcomes primarily through their influence on school conditions.

Exploring how school leadership contributes to restructuring efforts, Leithwood and Jantzi (1998, 1999, 2000) conducted a series of large-scale quantitative studies analyzing the effects of TL on organizational conditions and student engagement in Canada. Organizational conditions reflected both broader school conditions related to decisions taken outside of the classroom to support student learning and classroom conditions more directly related to learning in the classroom. In all three studies, student engagement had a psychological or affective component measured by the degree to which students identified with the school and a behavioral component indicated by the degree to which students participated in school functions.

All three Canadian studies revealed that TL had strong direct effects on organizational conditions and weaker indirect effects on student engagement. In their first study of 2,727 teachers and 9,025 students from 110 elementary and secondary schools, Leithwood and Jantzi (1998) found that leadership behaviors were significantly related to school conditions but only weakly or negatively related to classroom conditions. While transactional leadership practices had weak, negative, and non-significant effects on the two components of student engagement, TL demonstrated strong, positive effects on student engagement. In their follow-up study of 1,818 teachers and 6,490 students from 94 elementary schools, Leithwood and Jantzi (1999) reported not only that TL had strong direct effects on school conditions but also that these conditions had strong direct effects on classroom conditions. Additionally, TL had weak yet statistically significant effects on the student identification subscale of student engagement. In the third study of 1,762 teachers and 8,805 students from 110 elementary and junior high schools, Leithwood and Jantzi (2000) found that TL behaviors had strong direct effects on school conditions and weak but significant indirect effects on student engagement. Although TL affected both components of student engagement (i.e., participation and identification) in this study, all of the organizational factors loaded on just one school-level factor, muddling the earlier distinction between school and classroom conditions.

While these studies showed that TL was associated with positive school outcomes, they did not analyze the effects of specific TL behaviors. They also exposed how such behaviors are related to context, such as SES. In all three studies, the effect of TL behaviors diminished significantly in schools whose students reported higher levels of family support for intellectual work at home. Other studies also cast doubt on the source

and direction of the relationship. In their secondary analysis of four studies of secondary school leadership in the Netherlands, Kruger, Witziers, and Slegers (2007), for instance, found that principals appear to respond favorably to student commitment. Thus, principals might be responding to higher levels of student commitment by practicing more flexible and inclusive leadership behaviors. Additionally, Kruger et al. (2007) reported that school size and SES played far more significant roles in explaining student commitment than did principal leadership.

In two rare studies conducted in United States, Griffith (2004) and Valentine and Prater (2011) showed that TL behaviors are positively associated with student achievement. Surveying 1,791 teachers in 117 suburban elementary schools, Griffith (2004) found that TL behaviors positively affected academic achievement through their positive influence on teacher job satisfaction. Moreover, the minority achievement gap was lower in schools where teachers rated their principals' TL more favorably. Surveying 443 teachers in 131 Missouri high schools, Valentine and Prater (2011) found that *articulating a vision* and *providing a model* had greater effects on student achievement than instructional leadership did. Although these studies point to the benefits of TL, neither study examined changes in teacher agency or behavior. Moreover, while Griffith (2004) did not examine the effects of specific TL behaviors, Valentine and Prater (2011) compared different types of leadership behaviors without including intermediate school variables that might help explain how those behaviors affect learning.

While these five studies reveal positive associations between TL, favorable school conditions, and student outcomes, they offer very few insights into how specific TL behaviors relate to teacher attitudes and behaviors in relation to those student outcomes,

especially in high schools. The sole study conducted in high schools in the United States did examine specific TL behaviors; however, it failed to analyze intermediary school factors. Since school leaders predominately affect student outcomes indirectly, understanding how these leadership behaviors influence teachers' attitudes and behaviors in relation to student outcomes is essential to understanding effective leadership.

Transformational leadership and teacher commitment. Searching for a possible intermediate variable in the relationship between TL and school outcomes, four international studies conducted by Leithwood and associates have explored the role of teacher commitment to change during reform. All four studies drew upon Bandura's (1986) and Ford's (1992) comprehensive theories of motivation as a framework for teacher commitment, which included teachers' emotions, personal goals, and agency beliefs. While two of the following studies only examined commitment (Leithwood, Jantzi, & Fernandez, 1994; Yu, Leithwood, & Jantzi, 2002), the other two examined both commitment and participation in decision-making and either professional development activities (Geijsel, Slegers, Leithwood, & Jantzi, 2003) or professional learning activities (Geijsel, Slegers, Stoel, & Kruger, 2009). These studies revealed that a principal's TL behaviors, especially *direction setting* activities associated with *vision building*, positively affect teacher commitment both directly and indirectly through mediating school factors. A separate study conducted in India corroborated the relationship between TL behaviors and teacher attachment and commitment (Krishnan, 2005).

Exploring the relationship between TL behaviors and teacher commitment, Leithwood et al. (1994) and Yu et al. (2002) highlighted the important role of TL

behaviors related to strategies that help define and promote common future goals for the school. These behaviors are often referred to by various labels including *vision building* and *direction setting*. Surveying 168 teachers from nine secondary schools in Canada, Leithwood et al. (1994) found that TL behaviors accounted for a significant amount of the differences in teacher commitment to change. Specifically, *vision building* and *developing a consensus* among staff about goals significantly predicted differences in teacher commitment while the other TL behaviors related to *providing models* and *individualized support* made no contribution. Although most of the TL effects were mediated by in-school and out-of-school conditions, *vision building* activities directly affected teacher commitment. More importantly, TL explained slightly more commitment than all school conditions combined. Out-of-school conditions included policy initiatives while in-school conditions included school culture, goals, programs, policies, and resources. Similarly, in their Hong Kong study of 2,092 teachers from 107 primary schools, Yu et al. (2002) found that all of the TL behaviors were significantly associated with and explained differences in all four components of teacher commitment and three of the components of school support for change—culture, strategies, and structure. Of the variables measuring teacher commitment, TL had the greatest effect on teachers’ context beliefs, which reflected the degree to which teachers believed that the administration would actually support their efforts, and teachers’ capacity beliefs, which reflected the degree to which the teachers considered themselves capable of accomplishing change. Once again, *direction-setting* behaviors related to establishing future goals explained the greatest amount of variance in teacher commitment.

The two other studies adopting the same commitment framework reiterated the importance of *vision building* in the relationship between leadership, teacher commitment, and teacher participation. Comparing results from their studies of 1,246 secondary teachers in the Netherlands and of 853 junior high and secondary teachers in Canada, Geijsel et al. (2003) found that a principal's *individualized consideration* of teachers contributed slightly to their capacity beliefs and negligibly to their context beliefs. They also found that teacher capacity and context beliefs mediated the relationship between TL behaviors and teacher willingness to participate in decision making and professional development activities. Similar to Yu et al (2002), Geijsel et al. (2003) reported that TL had greater effects on teacher context beliefs than on their capacity beliefs. More specifically, behaviors related to *vision building* and to the *intellectual stimulation* of creativity and innovation had the greatest effects on context beliefs while *individualized consideration* of teachers' needs had the least significant relationship with both commitment and extra effort. Overall, the three TL behaviors, most notably those related to *vision building*, explained a substantial amount of variance in teachers' extra effort. Capacity beliefs served as the main link between TL and teachers' extra effort in the Dutch study, while context beliefs played a more prominent role in the Canadian study. Although Geijsel et al. (2003) provided no explanation for the differences in the findings, the comparative study confirms the mediating roles of teacher agency beliefs, especially context beliefs. They recommend exploring how other TL behaviors relate to teacher extra effort, which they claim is essential to the success of reform initiatives. They also suggest that the negative effects of *intellectual stimulation* on a teacher's willingness to participate in professional development activities might be

attributed to multi-collinearity of the dimensions of TL; nevertheless, they report the positive effects of the TL dimensions without any reservations about multi-collinearity.

Geijsel et al. (2009) similarly confirmed the significance of *vision building* in a Dutch study of 328 primary school teachers. They found that while *intellectual stimulation*, *individualized support*, and *vision building* behaviors indirectly affected teacher commitment to professional learning activities, only *vision building* had a direct effect on teachers' changed practice and directly reinforced the teachers' internalization of school goals. The other TL behaviors worked primarily through organizational factors: while *intellectual stimulation* had a direct effect on teacher collaboration, *individualized support* had the weakest explanatory value, working through participative decision-making. Finally, the more teachers participated in decision making, the more they internalized the school's vision.

Although Krishnan's (2005) study did not explore the effects of different types of TL behaviors or teacher motivation, it corroborated the relationship between TL and teacher commitment, regardless of the duration of the relationship between teacher and principal. Evidence from 130 teachers in one high school in India revealed that TL was positively related to the teachers' identification with, attachment to, and affective commitment to the school. Dividing the sample into teachers who had taught in the school prior to the current principal's arrival and teachers who had not, Krishnan (2005) found that duration affected a teacher's cognitive affiliation with the school but did not affect a teacher's emotional attachment or commitment to the school. As hypothesized, TL appears to have a more immediate influence on a teacher's emotional states, but requires longer periods of influence in order to change a teacher's cognitive states. In

other words, teachers who experienced TL behaviors were comparatively quick to exhibit emotional attachment and commitment to the school. It took longer, however, for teachers to accept the principal's value system as their own.

Combined, these five studies establish a link between TL behaviors and teacher commitment to the school. Additionally, the four studies conducted by Leithwood and associates highlight the importance of a principal's *vision-building* behaviors in motivating teachers and begin to reveal how teacher motivation serves as an intermediary between leadership and changes in teacher behavior. These specific findings related to the effects of *vision-building* activities, however, remain uncertain in light of concerns about multicollinearity that a few researchers mention without fully analyzing (Geijsel et al., 2003; Yu et al., 2002). Additionally, although three of these studies were conducted in high schools, none of them were conducted in the U.S., and while several did include teacher motivation, these studies did not consider collective efficacy beliefs, which appear to serve a more important role in student achievement.

Transformational leadership and instruction. The common feature of different types of instructional leadership that appear in the literature is their essential prioritization of student learning by emphasizing and facilitating the classroom practices of teachers (Leithwood, Louis, Anderson, & Wahlstrom, 2004). Moreover, the history of instructional leadership research reveals a widening of leadership strategies used to affect classroom instruction from direct supervisory and monitoring techniques to broader, more nurturing management activities. Emerging in the early 1980s, instructional leadership models highlighted the principal's supervision and control of curriculum and instruction (Hallinger, 2003). By the 1990s, alternative leadership models, such as TL,

challenged old instructional leadership models by focusing more on promoting organizational capacity. More recently, research suggests that sustained school improvement necessitates leadership that combines TL behaviors with instructional support (Hallinger, 2003, 2005; Kruger, Witziers, & Slegers, 2007; Marks & Printy, 2003; Valentine & Prater, 2011).

Although the current demands of high-stakes testing and accountability require that principals take greater responsibility for instruction and learning (Camburn, Rowan, & Taylor, 2003; Coldren & Spillane, 2007; Nettles & Herrington, 2007; Reitzug, West, & Angel, 2008; Wahlstrom & Louis, 2008), studies that examine how principals influence classroom teaching and student achievement remain limited (Blase & Blase, 2000). The available research, nevertheless, reveals that school leaders should include strategies aimed at improving classroom instruction. In their review of leadership research, Leithwood et al. (2004) maintained that only classroom instruction contributes more to student learning than school leadership does. In fact, “the total (direct and indirect) effects of leadership on student learning account for about a quarter of total school effects” (p. 5). Thus, leaders who combine transformational techniques that foster teachers’ commitment and capacity with techniques that improve classroom instruction stand to achieve the greatest combined leadership effect in schools. Including leadership behaviors that focus on instruction within a framework on transformational leadership is a natural and necessary progression of leadership research over the past five decades.

Even early formulations of instructional leadership that focused on supervisory and monitoring techniques included *direction setting* and *vision building* behaviors. In the development of their Principal Instructional Management Rating Scale (PIMRS),

Hallinger and Murphy (1985) identified 10 categories of instructional leadership categorized under three broad dimensions: *defining the mission*, *promoting school climate*, and *managing the instructional program*. Similarly, in their study of high school and elementary school principals, Heck, Larsen, and Marcoulides (1990) included *defining the mission* within *promoting the school climate* and found that school climate and instructional organization strongly predicted school achievement. Although all principals drew upon these types of behaviors, the more successful principals were more likely to involve teachers in decision-making, protect teachers from interference, and maintain high academic standards. Most notably, Heck et al. (1990) concluded that since “many of the important instructional leadership variables influencing school achievement are not related to the regular clinical supervision of teachers” (p. 121), principals should focus on inclusive forms of governance and supportive school climates aimed at high standards. Similarly, in a review of the instructional leadership literature, Krug (1992) acknowledged that while principals had traditionally focused on retrospective evaluations of teacher performance, effective instructional leadership requires that principals focus prospectively on teacher development. Krug also emphasized the need for principals to promote an instructional climate that supports teachers in their instruction instead of controlling and dictating what they do.

While more recent meta-analyses have demonstrated that leadership has indirect effects on student learning by affecting school conditions conducive to learning (Hallinger & Heck, 1996), very few studies have examined the relationship between principal instructional leadership and student achievement in the post-NCLB era (Crum & Sherman, 2008; O'Donnell & White, 2005). Recent studies, however, continue to

highlight the importance of supportive rather than controlling instructional leadership strategies. Qualitative studies reveal that teachers favor principals who use broad management techniques to nurture a culture of high academic expectations over principals who use monitoring and controlling techniques to intervene in classroom instruction. Analyzing responses to an open-ended questionnaire about effective principals in the United States, Blase and Blase (2000) concluded that the emotional, cognitive, and behavioral benefits reported by the 809 teachers in their sample resulted from principals who “reflected a firm belief in teacher choice and discretion, nonthreatening and growth-oriented interaction, and sincere and authentic interest” (p. 137). In a more focused study of instructional techniques that combined observations coupled with teacher survey data, Quinn (2002) found that teachers used more active teaching techniques reflected in their students’ more active learning strategies in schools where principals served as instructional resources. The more effective principals in the eight elementary, eight middle, and eight high schools in Missouri fulfilled the roles of *resource provider*, *instructional resource*, and *communicator*, instead of simply monitoring or supervising teachers. In fact, the final more intrusive strategy of *maintaining a visible presence* failed to correlate with instructional practice. Finally, Dinham’s (2005) qualitative study of 38 high-achieving secondary sites in Australia revealed the degree to which teachers attributed the school’s success to principal behaviors. Although the study focused on effective faculties and teams, the core category of responses reflected the importance of the principals’ focus on teaching and learning. Principals in effective schools “constantly remind[ed] students, staff and the community that the core purpose of the school is teaching and learning” (p. 354). Among the other

key themes, principals in effective schools clearly communicated expectations associated with their vision and fostered a culture of responsibility and trust. Overall, Dinham's categories, including collaborative decision-making and flexible rules and procedures, overwhelmingly reflect the supportive, as opposed to the more controlling, roles of principals in promoting student achievement.

Recent quantitative studies have also confirmed the importance of an academic focus that is supportive rather than controlling. Alig-Mielcarek and Hoy (2005) combined three widely published models, including Hallinger and Murphy's (1985) model, to illustrate three "fundamental instructional leadership functions": *defining and communicating goals, monitoring and providing feedback on the teaching and learning process, and promoting and emphasizing the importance of professional development* (p. 32). Using their validated model, Alig-Mielcarek and Hoy (2005) found that principal instructional leadership had no direct effects on student achievement in their sample of 146 elementary schools in Ohio. However, regardless of a school's SES, strong instructional leaders did affect student achievement positively by fostering a climate of high academic standards, called *academic press*. They concluded that instructional leaders enhance the academic excellence of their students by improving the quality and quantity of academic-oriented interactions between teachers and students, but not by controlling and specifically directing the classroom instruction of teachers. They called on researchers to continue to research school variables—such as trust, collective efficacy, and academic press—that can combat the negative effects of low-SES on student achievement.

In another quantitative study analyzing data collected from 75 middle schools and 325 educators, O'Donnell and White (2005) reported that teachers reported that principal instructional leadership behaviors were significantly and positively associated with student performance on the middle-school reading and mathematics sections of the Pennsylvania System of School Assessment (PSSA). They used Hallinger's (1982) Principal Instructional Management Rating Scale (PIMRS), which includes three broad behaviors related to instructional leadership: *defining the school mission*, *managing the instructional program*, and *promoting the school learning climate*. *Promoting the school learning climate* held the greatest association with and explained a significant amount of the differences in both types of achievement scores. Principal behaviors on the PIMRS for *promoting the school learning climate* reflect a large number of items that are specifically directed at students with a few specifically directed at teachers. Once again these findings suggest that supporting high academic standards does not require that the principal supervise or intervene in specific teacher practices in the classroom. Because this study did not include any intervening, alterable variables through which principals might affect student achievement, the overall effects of principal behaviors on student achievement were sparse. Had they included intervening variables, their findings might have reflected larger total effects of such leadership behaviors and helped explain how such leadership behaviors change teacher behaviors.

A few recent quantitative studies have examined intervening school variables to see how principals can indirectly affect classroom instruction and learning by improving school conditions that mediate the relationship between leadership and learning. Two studies conducted in the United States emphasize the importance of involving teachers in

participatory decision-making and collaborative processes. Examining teacher survey data from 4,165 K-12 teachers who participated in the Learning from Leadership national research project, Wahlstrom and Louis (2008) found that expanding the decision-making process to include teachers is “an important step that leaders can take in long-term efforts to improve instruction” (p. 479) while merely increasing levels of trust may affect overall school climate but have less direct effects on instruction. They surmised that trust in the principal’s general support for instruction reflects a passive form of leadership that does not have as much effect on actual instructional choices. Accordingly, principals who develop a sense of trust while engaging teachers in specific classroom practices should affect their teachers’ instructional practices, more significantly. On the other hand, they also found that stronger professional communities were associated with less dependence on principals for instructional leadership. Thus, there may be a weaker or even inverse relationship between collective efficacy and principal leadership in schools where teachers depend on strong professional learning communities instead of principals for instructional support. Supovitz, Sirindes, and May (2010) examined how principal leadership was related to teacher collaboration, teacher change in instruction, and student learning in one mid-sized urban district in the southeastern United States. Results from 721 teachers from 38 elementary and middle schools revealed that principals affect teacher instruction in both language and mathematics directly and indirectly by nurturing an environment where teachers collaborate around instruction. Principal leadership also indirectly affected student English language achievement through its effects on teacher collaboration and teacher instructional change. Although Supovitz et al. (2010) did not report the effects of different types of principal leadership behaviors, their model

included *developing mission and goals, focusing on instructional improvement, and fostering an environment of trust*. These two studies help explain the role of instructional leadership by including intervening variables (i.e., participatory decision-making and collaboration) that help explain how leaders change teacher instructional practice.

A very recent quantitative study included intervening student variables and corroborated the distinction between supportive and controlling types of instructional leadership behaviors. Examining survey data from 52 secondary schools experiencing high-stakes accountability in Hong Kong, Lee, Walker, and Chui (2012) found that contrasting types of instructional leadership affected the relationship between student attitudes toward school and student learning. The 180 administrators and senior teachers in the study evaluated the principals' use of *instructional management* techniques that foster a culture of instructional innovation aimed at achieving high academic goals and their use of *direct supervision* techniques to monitor specific teacher instruction and learning outcomes. *Instructional management* techniques included broad initiatives such as “encouraging staff to consider new ideas for their teaching” and “initiating school-based instructional projects” that provided direction for teachers to pursue their own talents. On the other hand, *direct supervision* techniques included specific monitoring activities that intervened in teacher instruction such as “inspecting student homework” and “observing classroom activities.” Additionally, 2,032 students rated their level of attachment to the school, reflecting the degree to which they felt they belonged in the school community. Lee et al. (2102) found that where principals adopted more *instructional management* techniques, the relationship between student attachment and student learning was stronger. On the other hand, in schools where principals adopted

greater levels of *direct supervision*, the positive relationship between student attachment and student learning diminished. The researchers reasoned that staff's positive experiences of their principals' instructional leadership practices influenced student learning by enhancing their students' sense of attachment to their schools. Thus, principals who encouraged teachers to embrace new ideas and innovative practices influenced student learning by enhancing the positive school-related experiences of teachers and students. Since the survey did not directly measure how the key staff felt about their principals' instructional leadership techniques, the link between these techniques and student attachment is logical, yet unconfirmed. Nevertheless, since studies show that TL appears to enhance student engagement (Leithwood & Jantzi, 1998, 1999, 2000) and that student attachment is correlated with teacher perceptions of principal support (Krug, 1992), this study suggests that principals can augment the effectiveness of their TL behaviors by selecting instructional management practices that support innovative teachers with high academic expectations instead of adopting direct supervisory practices.

Demonstrating the widening of instructional leadership research, two recent studies have specifically explored the relationship between transformational leadership behaviors and instruction (Leithwood & Jantzi, 2006a; Thoonen, Slegers, Oort, Peetsma, & Geijssel, 2011). Drawing upon survey data from 2,290 teachers from 655 primary schools in England, Leithwood and Jantzi (2006a) found that TL behaviors directly affected teachers' self-efficacy beliefs, collective efficacy beliefs, and classroom practices, which included self-reported implementation of new teaching strategies and increases in time spent on instruction. Although TL explained a significant proportion of

the differences in classroom practices, Leithwood and Jantzi (2006a) did not analyze the separate effects of different types of TL—*direction setting*, *developing people*, and *redesigning the organization*. More recently, Thoonen et al. (2011) examined the relationship between TL and classroom teaching practices in a sample of 502 elementary school teachers in the Netherlands. They found that a combination of TL behaviors affected organizational factors and teacher motivation—both of which mediated the relationship between TL practices and teacher behavior. Overall, the principal’s TL behaviors directly affected the degree to which teachers engaged in certain professional learning behaviors. However, whereas the principal’s *intellectual stimulation* of creativity and innovation encouraged teachers to keep up-to-date with changes in their practice, the principal’s *vision building* behaviors associated with setting collective goals and direction had negative effects on keeping up-to-date. Similarly, the principal’s *individualized support* of teachers had negative effects on those teachers’ desires to experiment and reflect on their practice. Thus principals appear to undermine their teachers’ critical (i.e., the use of experimentation and reflection) approach to instruction by making their teachers feel more certain and supported about their work. Moreover, while participation in professional learning activities mediated the effect of teacher motivational factors, such as a sense of self-efficacy, on teaching practices, the more uncertain teachers felt about the future, the more willing they were to experiment with and reflect on their practice. Principals can, however, increase collective cohesion and commitment through *vision building* behaviors. Thoonen et al. (2011) recommended further investigation of the dimensions of the TL in order to explore the relative effects of TL behaviors. Most importantly, they suggested using “more integrated models, in which transformational

leadership and instructional leadership coexist” in order “to assess the impact of leadership practices on school effectiveness and school improvement” (p. 521).

Although the research on TL leadership in schools has begun to illuminate how principals can affect school conditions and teacher behaviors that improve academic achievement, very few studies have been conducted in high schools or in the United States. As Thoonen et al. (2011) revealed, composite studies of principal TL behaviors mask the interplay between types of leadership behaviors. While some transformational leadership behaviors appear to instill direction and confidence, others seemingly promote innovation and reflection. Understanding how particular leadership behaviors achieve these sometimes disparate aims will help school leaders direct their efforts towards a balance of such outcomes.

Teacher Agency Beliefs

Since principals influence favorable student outcomes indirectly, they must motivate teachers to change their instructional practices in order to improve student achievement. Therefore, examining how principals motivate teachers is crucial for successful school reform. This section of the literature review introduces theoretical underpinnings for the role of personal agency beliefs (i.e., an individual’s efficacy and context beliefs) in motivation, relates self-efficacy beliefs to a relatively new focus on collective efficacy beliefs, and ends with a review of studies on the role of teacher agency in schools.

Agency beliefs are essential to most theories of motivation (Bandura, 1993, 1997; Ford 1992). Reviewing a range of motivational theories, Ford (1992) proposed an integrative model of motivation that combines psychological mechanisms “that serve to

direct, energize, and regulate goal-directed activity” (p. 3). These future-oriented mechanisms assist individuals as they evaluate the future outcomes of possible actions. At the center of Ford’s (1992) model are personal agency beliefs that include the individual’s beliefs about her goal-related capabilities or capacities and the individual’s beliefs about how supportive the environment or context will be to those goal-oriented activities. Together these two sets of beliefs “provide the person with the information needed to decide whether to initiate, maintain, amplify, or inhibit some pattern of goal-directed activity” (Ford, 1992, p. 74). According to Ford, research designs and analyses should include multiple aspects of motivation in order to reveal their interaction in explaining how individuals bring about change.

Helping to explain why individuals initiate change, Bandura’s (1993, 1997) social cognitive theory of motivation identifies the same two personal agency beliefs related to the individual’s perceived controllability of an environment. On the one hand, *efficacy beliefs* reflect an individual’s beliefs in her capability to bring about change through perseverance and innovative responses to new challenges. On the other hand, *context beliefs* reflect an individual’s beliefs in the degree to which the environment can be modified, the degree to which it is willing to accept the changes brought about by agentive action. Accordingly, individuals—whether alone or in groups—perform cognitive processing to assess choices of action by weighing their perceptions of their capacities within a particular context in order to assess the likelihood of achieving certain goals. Bandura (1993) maintained that “the impact of most environmental influences on human motivation, affect, and action is heavily mediated through self processes,” and self-efficacy—“people’s belief about their capabilities to exercise control over their own

level of functioning and over events that affect their lives”—serves as the most prevalent causal explanation of human agency (p. 118). While teachers’ beliefs concerning their instructional self-efficacy have been shown to predict student academic success, teacher self-efficacy arises from more than mere content knowledge mastery and professional development. Since teachers “operate within an interactive social system rather than as isolates,” teachers and school leaders have an incredible influence on each other’s self-efficacy (p. 141). Thus, these agency beliefs may help explain how environmental events or circumstances, such as leadership behaviors and administrative support, take on internal psychological significance in teachers, resulting in increased performance.

Although individuals and groups of individuals within the same organization principally operate within the same context, individuals within the same context might have significantly differing beliefs about their own capabilities and the capabilities of the larger group. Bandura’s social-cognitive theory recognizes the collective efficacy of groups as a construct correlated with, yet separate from, personal efficacy. Moreover, while group agency does not exist independently of individual agency, the collective agency of an organization is not merely the sum of individual perceptions of self-efficacy, for these individual perceptions ignore interactions and interdependencies of the individuals in the group working together. Thus, within organizations, collective efficacy beliefs emerge as motivational resources independent of the individual’s personal efficacy beliefs as individuals assess their resources and capabilities at the team level (Taggar & Seijts, 2003). When individuals rely on one another to achieve goals they cannot achieve individually, they draw upon collective efficacy, their “shared beliefs in their collective power to produce desired results” (Bandura, 2000, p. 75). Specifically in

schools, *collective teacher efficacy* is “an emergent organizational characteristic formed from the interaction of teacher perceptions about group teaching competence and the difficulties inherent in the educational task facing the school as well as the supports available in the setting” that is related to but separate from the teachers’ combined self-efficacy beliefs (Goddard, 2001, p. 469). According to Bandura (1997), such domain-linked scales of collective efficacy have greater predictive and explanatory power than global efficacy scales.

School-based studies have confirmed the separate nature of both types of teacher efficacy beliefs. Surveying 113 teachers at one Texas high school, Kurz and Knight (2004) demonstrated a moderate, positive relationship between personal teacher efficacy and collective teacher efficacy and showed that *goal consensus* and *vision building* activities predicted significantly more collective teacher efficacy than personal efficacy beliefs. Kurz and Knight surmised that “schools with more “concerted institution building” might “cause schools to become more tightly coupled,” resulting in higher collective efficacy beliefs. Thus, these two types of efficacy beliefs appear to stem from different sources with communal activities affecting collective efficacy beliefs more than personal efficacy beliefs. Goddard, Hoy, and Hoy (2000) and Goddard and Goddard (2001) have also demonstrated that personal teacher efficacy and collective teacher efficacy are separate yet moderately correlated constructs. As an emergent group-level property, collective efficacy can be greater or less than the combination of individual self-efficacy beliefs. While individuals with weak self-efficacy beliefs can develop strong collective efficacy beliefs by working together, individuals with strong beliefs in their self-efficacy can develop weak collective efficacy beliefs through their inability to work

well together (Caprara, Barbaranelli, Borgogni, & Steca, 2003). Thus, in addition to affecting personal teacher efficacy beliefs, one way that school contextual factors, like the principal's leadership style, may contribute to teacher performance and student academic achievement is by contributing to teachers' beliefs in their combined organizational efficacy.

Collective efficacy beliefs influence commitment to future goals, the amount of effort put forth, and the degree to which individuals persevere against the odds (Bandura, 2000). As Caprara et al. (2003) found in their survey of 2,688 teachers in 103 Italian junior high schools, the effects of teachers' collective efficacy beliefs on teacher job satisfaction outweighed the effects of their self-efficacy beliefs. Thus, effective leadership and collegiality can motivate teachers through their collective efficacy beliefs, largely independent of their self-efficacy beliefs. Bandura (2000) concluded that research "findings taken as a whole show that the higher the perceived collective efficacy, the higher the group's motivational investment in their undertakings, the stronger their staying power in the face of impediments and setbacks, and the greater their performance accomplishments" (p. 78). Although schools present obstacles to developing strong collective efficacy (Bandura, 1997), crafting a shared vision and a collaborative culture focused on student achievement should foster strong beliefs in teachers' combined ability to teach even the most difficult students. In addition to mastery experience, shared experiences, social persuasion, and positive affective states provide sources of efficacy information (Bandura, 1997; Goddard et al., 2000), all of which are related to transformational behaviors. Moreover, visible measures of success reinforce beliefs in

collective efficacy, which in turn support greater levels of success (Bandura 1997; Goddard et al., 2000).

School-based Studies of Collective Teacher Agency Beliefs

The following section of the literature review tracks the roughly chronological expansion of research on teacher agency beliefs over the past two decades. It begins with the early studies that were mostly concerned with defining collective teacher efficacy (CTE) and examining CTE's association with student achievement in relation to school socioeconomic status (SES). Next, it presents studies that explored how other unchangeable school factors, especially past academic achievement, affect CTE. Third, the review examines studies that explored how changeable school factors such academic focus and structural features enhance CTE. Finally, this section of the review ends with the few studies that have explored explanatory models that relate CTE to school leadership and teacher outcomes.

CTE, SES, and student achievement. Largely inspired by Bandura's (1993) findings, numerous school-based studies have found significant, positive relationships between collective teacher efficacy and student achievement (Goddard, 2001; Goddard & Goddard, 2001; Goddard, LoGerfo, & Hoy, 2004; Goddard et al., 2000; Moolenaar, Slegers, & Daly, 2012; Tschannen-Moran & Barr, 2004). Primarily concerned with combatting the overwhelming influence of a school's low socioeconomic status (SES), these researchers championed CTE as a possible organizational factor that can overcome the detrimental effects of lower SES. In his influential inaugural study of CTE, Bandura (1993) reported that schools with lower SES and student stability, in terms of higher student absenteeism and student turnover, were associated with lower levels of CTE and

achievement. Nevertheless, Bandura concluded that the total negative effects of low SES and student instability were mostly mediated through their direct effects on CTE. That is, organizational factors such as low SES undermine student achievement indirectly by first weakening the teachers' beliefs in their abilities to teach their low-SES children. Thus, Bandura argued that strong collective efficacy beliefs can outweigh the negative effects of student body characteristics through CTE's larger direct effect on student achievement.

Within a decade, a series of school-based studies set out to verify Bandura's initial finding that collective efficacy has positive, independent effects on student achievement that can outweigh the negative effects of low SES. Three studies that drew upon nearly 500 teachers from 47 elementary schools from the same large urban school district in the Midwest found independent effects for CTE even when controlling for SES. Goddard et al. (2000) reported that CTE was the single largest predictor of the differences between schools in mathematics and reading achievement, outweighing the individual effects of SES, race, and gender. Similarly, Goddard (2001) found that collective teacher efficacy was strongly correlated with student achievement even when controlling for demographic variables and past student achievement. Finally, Goddard and Goddard (2001) found that collective efficacy served as the sole predictor of differences in individual teacher efficacy. Surveying one third of the teachers at 66 middle schools in Virginia, Tschannen-Moran and Barr (2004) calculated that CTE was significantly related to academic achievement for eighth grade students on high-stakes tests in English, math, and writing. When they controlled for SES, CTE only continued to explain a significant amount of variance in writing, not in math or English achievement. However, they surmised that the very high correlation between SES and student

achievement most likely obscured the effects of CTE. Most recently, Moolenaar et al. (2012) confirmed that CTE explained a significant amount of variance in language achievement in a sample of 775 teachers from 53 Dutch elementary schools.

Because the three earliest studies were mostly concerned with developing and testing CTE instruments, they did not explore intervening variables between CTE and achievement or the effects of changeable organizational factors on CTE. Nevertheless, they did demonstrate strong relationships between past achievement, CTE, and student achievement even when controlling for unchangeable school factors like SES. In addition to replicating these early findings, Moolenaar et al. (2012) found that dense, but not centralized, teacher networks appeared to promote CTE by allowing teachers to share advice. While all four of these studies demonstrated CTE's association with achievement, Goddard (2001) ushered in a new wave of research by revealing that CTE reflected more than mere beliefs about past achievement.

CTE, past mastery experience, and student achievement. Following Bandura's (1997) analysis of the factors contributing to the formation of efficacy beliefs, researchers have explored the relationships between past mastery experience, CTE, and student achievement (Cybulski, Hoy, & Sweetland, 2005; Goddard, 2001; Goddard et al., 2004; Goddard & Skrla, 2006). These studies indicate that although past mastery experience in the form of previous achievement accounts for a significant amount of teachers' beliefs in their capabilities, CTE independently contributes to future achievement. Building upon Goddard's (2001) findings, Goddard et al.'s (2004) study of teachers from 96 high schools in one large Midwestern state revealed that CTE predicted a significant amount of student academic success, even when controlling for past mastery. In a follow-up

study of 1,981 teachers from 41 elementary schools in one urban school district in the Southwest, Goddard and Skrla (2006) also found that a substantial amount of CTE was unrelated to past mastery, and Cybulski et al. (2005) confirmed the independent effects of CTE on student achievement in their study of the effects of school fiscal efficiency on 146 elementary teachers in Ohio. Combined, these studies reveal that CTE represents more than teachers' beliefs about how their schools have performed in the past. Thus, current school factors, such as leadership, can alter teachers' beliefs about their colleagues' abilities to teach students, independent of how teachers in the school have succeeded at teaching students in the past.

Although past mastery does influence current efficacy beliefs substantially, it is very difficult to manipulate. Individuals can publicize or emphasize past achievement, but they cannot actually alter past achievement records. In this way, past achievement is similar to demographic variables and a school's SES, which are both very difficult to alter. Given the large amount of CTE open to manipulation, Goddard and Skrla (2006) recommended that future studies explore the extent to which leadership characteristics and teachers' beliefs about reform can affect CTE. By distinguishing CTE from unalterable school factors, these studies served an important role in solidifying the importance of CTE as a mediator of student achievement. They do not, however, help explain how CTE can specifically be improved in schools because they did not examine the role of leadership.

Teacher efficacy and transformational leadership. Only a handful of studies have examined the relationship between leadership and teacher efficacy beliefs, especially beliefs about collective teaching efficacy. Two early studies examined the

relationship between transformational leadership behaviors and teacher self-efficacy drawing upon survey and interview data from 280 teachers and principals from 10 elementary schools in Wisconsin. Hipp and Bredesen (1995) found that principal transformational leadership was slightly more correlated with general teacher efficacy than personal teacher efficacy. While personal teacher efficacy reflected a teacher's beliefs about her own ability, general teacher efficacy measured a teacher's general beliefs about the power of education to reach children. Specifically, *models behavior* was significantly correlated with both types of efficacy beliefs, and *inspires group purpose* was significantly correlated with general teacher efficacy. Hipp (1996) confirmed these relationships through teacher interviews. Highlighting the importance of group purpose, teachers consistently used collective pronouns like "we" and "us" instead of individual pronouns. In addition to TL behaviors, Hipp also found numerous factors related to teachers' sense of efficacy. Teachers reported that factors outside of the principal's control like budget and organizational structures as well as factors within the principal's control such as empowerment and decision-making affected their sense of efficacy. Hipp (1996) found that principals affected teacher self-efficacy by recruiting teachers to help solve in-school problems and creating structures for shared decision-making. Although Hipp's (1996) interviews highlighted the role of mediating factors in the relationship between TL and teacher self-efficacy, Hipp's (1995) quantitative analysis did not include intervening variables.

In a more recent study of the relationship between TL and teacher efficacy, Nir and Kranot (2006) discovered that intervening school variables diminished the direct effects of TL. Drawing upon survey data from 755 teachers in 79 Israeli elementary

schools, Nir and Kranot (2006) found that teachers reported higher levels of personal efficacy in schools with principals rated above average on TL, measured by *intellectual stimulation*, *inspirational motivation*, and *idealized influence*. Differences in *individualized consideration*, on the other hand, were not associated with differences in personal efficacy. However, when Nir and Kranot included other job-related variables in their analysis, the relationship between these TL behaviors and personal efficacy was statistically insignificant. They concluded that autonomy and role satisfaction mediated the relationship between TL and personal efficacy. That is, principals affect their teachers' personal efficacy by promoting an environment conducive to favorable working conditions that allow for self-directed performance.

In order to address the gap in understanding about how school leaders can affect their teachers' beliefs in their combined capabilities, three school-based studies have examined the relationship between transformational leadership and collective efficacy (Demir, 2008; Leithwood, Patten, and Jantzi, 2010; Ross & Gray, 2006a, 2006b). Analyzing survey data from 218 teachers in 66 Turkish primary schools, Demir (2008) found that TL affected CTE directly and indirectly through collaborative culture. Overall, TL accounted for over half of school differences in CTE. Although Demir's model did not include school outcome variables, Ross and Gray (2006a, 2006b) tested a more complex model of the relationship among TL, CTE, and commitment for 3,074 teachers in 205 elementary schools in two large Ontario school districts. As expected, TL had no direct effect on student achievement (2006a), but TL did affect achievement and teacher commitment indirectly through its influence on CTE (2006b). Teachers who perceived greater levels of TL reported greater levels of collective teacher efficacy as well as

greater levels of commitment to the school's mission, community partnerships, and the learning community. Analyzing survey data from 1,445 elementary school teachers in 199 Canadian schools, Leithwood et al. (2010) confirmed the relationship between leadership behaviors, teacher collective efficacy, and student achievement. Although they did not analyze the effects of particular leadership behaviors, leadership had a significant effect on collective teacher efficacy. Of all of the school-related variables, collective efficacy rivaled school SES for the most significant effect on student achievement. Additionally, when collective efficacy was included in the analysis, the effect of trust on student achievement became non-significant. These three studies indicate that principals, through their leadership style as well as through their influence on school culture, can promote their teachers' beliefs about their combined capabilities to teach students. As Kurz and Knight (2004) report, however, most of the existing studies have examined teacher efficacy in elementary schools; very few studies have examined high schools although high schools are quite different from other school levels.

Context beliefs and alterable school factors. By examining teachers' context beliefs, several studies have explored how broad, alterable school factors—most notably *academic press* and *enabling school structures*—can affect CTE and student achievement. While academic press reflects the degree to which schools focus intently on high academic standards, enabling school structures reflect the degree to which teachers perceive that the school's bureaucracy supports their work. Reviewing decades of research on bureaucracy, Adler and Borys (1996) sought to explain how evidence simultaneously pointed to the stifling and uplifting effects of bureaucracy. They concluded that employee perceptions depended on the degree to which rules were

formalized and decisions distributed in relation to the nature of the employee's work. A proper fit leads to increased commitment and innovation while an improper fit results in feelings of dissatisfaction and alienation. In the case of schools, research reveals the importance of a supportive bureaucracy, which is less hierarchical and less rule-driven (Adams & Forsyth, 2006; McGuigan & Hoy, 2006), and which maintains a school-wide academic focus (Hoy, Sweetland & Smith 2002; Wu, Hoy, & Tarter, 2013) that is more mastery-driven than performance-driven (Ciani, Summers, & Easter, 2008; Wolters & Daugherty, 2007).

Recent findings suggest that teachers' context beliefs about the importance the supportive nature of the bureaucracy affect student achievement, especially through their effects on teacher perceptions of collective efficacy. Enabling school structures have positive, significant effects on CTE. Exploring the proximate sources of efficacy in 79 Midwestern schools, Adams and Forsyth (2006) found that enabling school structures contributed substantially to 545 teachers' collective teacher efficacy beliefs (CTE). While past mastery experience explained the greatest amount of variance in CTE, enabling school structures accounted for more variance in CTE than either SES or school level did. Similarly, McGuigan and Hoy (2006) found that enabling school structures in 40 elementary schools in Ohio predicted students' academic achievement in math and reading through their immediate positive effects on academic optimism. Academic optimism reflected the school's emphasis on high academic achievement, the degree to which teachers trusted parents and students, and the level of teacher collective efficacy in the school. Analyzing survey data from 1,095 elementary school teachers in Taiwan, Wu, Hoy, and Tarter (2013) also found that enabling school structure affected student

achievement through its direct effect on academic optimism, including collective efficacy. Ironically, SES was not significantly related to student achievement in this study, perhaps as the researchers surmise, because “education is valued broadly across Chinese culture regardless of social class” (p. 187) and most students have access to similar instruction. According the Wu, Hoy, and Tarter (2013), the studies on academic optimism reveal “a strong synergy created by interactions of collective efficacy, collective trust, and academic emphasis” (p. 188).

All three of these studies indicate that teachers’ context beliefs contribute to collective efficacy beliefs that mediate the effects of context beliefs on school outcomes; however, neither McGuigan and Hoy (2006) nor Wu et al. (2013) examined the independent effects on each of the components of academic optimism on student achievement in order to isolate the effects of collective efficacy. Furthermore, none of these studies examined how specific principal leadership behaviors affect teacher perceptions of enabling structures even though the researchers suggest that school leadership should be able to affect these alterable school factors that affect collective efficacy and student achievement. Finally, none of the studies explore the relationship between these variables and teacher extra effort.

Recent findings also reveal that teachers’ context beliefs about the importance of academics affect student achievement, especially through their effects on teacher perceptions of collective efficacy. Hoy et al.’s (2002) analysis of survey data from 97 high schools in Ohio reported higher levels of academic press and collective efficacy were independently associated with higher levels of student achievement in mathematics, even when controlling for school SES. Of the three variables, collective efficacy was the

strongest predictor of achievement and surprisingly mediated all of effects of academic press on achievement. The degree to which a school was driven by a pursuit of academic excellence affected student achievement through its effects on CTE. Thus, a strong focus on academics has the potential to affect student achievement by strengthening CTE.

Two more recent studies have demonstrated how the types of achievement goals that a school emphasizes can affect teacher efficacy and classroom practices. Ciani, Summers, and Easter (2008) explored how teachers' beliefs about teacher community and school goal structure are related to teacher efficacy and classroom practices. Ciani et al. (2008) hypothesized that teachers' sense of community would be positively associated with their efficacy beliefs because of the communal nature of the four sources of efficacy beliefs: social interactions have the potential to influence past mastery experiences, affect, social persuasion, and most notably vicarious experiences. Closely associated with these communal beliefs are a school's goal structures that the school community emphasizes and rewards. Schools that focus on self-improvement as the student develops competence reflect mastery goal structures. On the other hand, schools that emphasize performance goal structures compare students' achievement outcomes in a competitive environment. Ciani et al.'s (2008) examination of 156 teachers from four Midwestern high schools revealed that teachers in high performance-oriented schools reported lower mean scores for perceived collective teacher efficacy and teacher community and higher mean scores for performance-oriented classroom goal structure. While this study did not include leadership behaviors, path analysis revealed that teachers' collective efficacy beliefs mediated the relationship between school-level goal structure and classroom goal structure and that higher levels of perceived school community predicted higher levels of

perceived collective teacher efficacy, which were associated with more teacher engagement of students, utilizing an array of instructional strategies, and managing student behavior. Given the small sample size, Ciani et al. (2008) were unable to include several latent factors in their path analysis, and they were forced to use the combined data for all four schools in their path analysis even though much of their analysis was conducted at the school level.

Also examining the relationship between efficacy and classroom goal structures, Wolters and Daugherty (2007) surveyed 1,024 pre-K through 12th-grade teachers from one large suburban school district in Texas. Although they only examined personal teacher efficacy, Wolters and Daugherty (2007) found that high school teachers reported a mix of lower levels of teacher efficacy and higher levels of performance orientation. In general, teachers who reported greater confidence in their abilities to meet their students' instructional needs also tended to report a mastery orientation to student learning. Although Wolters and Daugherty (2007) found no difference in goal structure based on years of experience, Ciani et al. (2008) found that first-year teachers in low performance-oriented schools reported the highest level of mastery classroom goal structures. A combination of mastery-oriented school-level goal structures and strengthened collective efficacy might challenge the finding that mere teaching experience does not foster the "more adaptive motivational climate" associated with mastery goal structures (Wolters & Daugherty, 2007). Overall, these two studies suggest that without strong leadership for mastery goal structures, teachers with lower self-efficacy and collective efficacy beliefs will tend to adopt performance instead of mastery learning objectives.

These six studies demonstrated that CTE can be influenced by teachers' beliefs about school-wide academic focus. Although earlier studies focused on school contextual variables that are very difficult to manipulate, these studies suggest that certain alterable school conditions like academic press and enabling school structure can have additional direct effects on CTE. Nevertheless, these studies did not explore specific leadership behaviors that promote these types of environments, nor did they examine the teacher behaviors that mediate the relationship between teachers' efficacy beliefs and school effectiveness. In order for school leaders to improve student achievement, they need to understand how specific leadership behaviors affect CTE and how increases in CTE affect teacher behavior.

Context beliefs and transformational leadership. Studies that have compared the effects of TL with those of transactional leadership shed some light on the relationship between TL and enabling school structures (Eyal & Roth, 2011; Korkmaz, 2007; Vecchio et al., 2008). These studies suggest that TL behaviors promote flexible, interactive cultures while transactional leadership behaviors reinforce more rigid bureaucratic structures. Korkmaz' (2007) study of 630 teachers in 46 Turkish high schools revealed that TL positively influenced teachers' perception of job satisfaction and the school's organizational health while transactional leadership behaviors had negative effects on the school's organizational health. In the study, organizational health reflected the school's ability "to successfully adapt to its environment, create solidarity among its members, and reach its objectives" (p. 32). According to Korkmaz, as transactional leadership increases, "the relationship among the staff weakens and commitment to the school's vision declines" (p. 45) because such leadership encourages teachers to be

committed to bureaucracy, avoid making mistakes, and focus on a narrow range of problems. Korkmaz surmised that TL promotes a healthier atmosphere in which teachers are more committed to their colleagues and student success. In their study of 179 teacher-principal dyads in California high schools, Vecchio et al. (2008) found a similar trade-off between transactional leadership practices and TL goals. They confirmed a negative interaction between the contingent reward dimension of transactional leadership and the *vision building* and *intellectual stimulation* activities of the principal. The principal's use of vision building activities and intellectual stimulation were more strongly and positively associated with teacher performance when the principal's use of contingent reward decreased. As a result, principals who engage in contingent reward potentially undermine their TL behaviors. Vecchio et al. (2008), however, did not include other TL dimensions such as *individualized consideration* or *idealized influence* in their analysis.

While the two previous studies suggest that bureaucratic practices reflected in transactional relations undermine the motivational mechanisms inherent in transformational leadership, Eyal and Roth (2011) found that the two types of leadership promoted starkly different types of motivation—*autonomous* and *controlled*. Autonomous motivation arises when followers adopt the leader's vision of organizational goals as their own and pursue those goals intrinsically. Controlled motivation, on the other hand, arises when leaders use extrinsic rewards and supervision to encourage followers to pursue organizational goals. Analysis of survey data from 122 Israeli elementary school teachers revealed that TL was associated with both autonomous motivation and lower levels of teacher burnout, while transactional leadership was associated with both controlled motivation and higher levels of teacher burnout. Eyal and

Roth (2011) maintain that since autonomous motivation helps integrate organizational vision with elements of the self, resulting in self-concordance, teachers who experience transformational leadership derive greater meaning from their work and rebound more readily from setbacks. Other non-school-based TL studies have confirmed the mediating roles of intrinsic motivation on athletic performance (Charbonneau, Barling, & Kelloway, 2001) and of autonomous motivation and self-concordance on commitment to and satisfaction with a broad range of organizations (Bono & Judge, 2003).

Although only one of these school-based studies comparing the effects of TL and transactional leadership behaviors was conducted in the U.S. and only one examined specific TL behaviors, they link TL behaviors to flexible, supportive environments that help align organizational and individual vision. As the research on teacher agency reveals, the combined effects of TL and enhanced teacher agency should result in effective schools with more highly motivated teachers and higher levels of student academic achievement. These studies also show that uncontrollable school factors like SES, student and teacher characteristics, and past mastery experiences influence the degree of CTE considerably. Nevertheless, a few studies indicate that a substantial amount of CTE can be influenced by alterable school context factors and leadership behaviors. Further research needs to explore the specific leadership behaviors that promote CTE and how CTE influences teacher behaviors, such as extra effort or instruction, that improve student learning.

To help explain the relationship between TL and favorable school outcomes, studies need to include specific leadership behaviors and both components of teacher agency along with school outcomes. Ross and Gray (2006a) recommended “that

researchers probe the leadership-efficacy relationship to link particular dimensions of transformational leadership and specific principal behaviors to enhanced agency beliefs in their staff,” especially since there is a “well-established connection between collective teacher efficacy and student achievement” (p. 192). Similarly, Goddard, Hoy, and Hoy (2004) recommend more research into the outcomes of collective teacher efficacy in order to “deepen our understanding of how to improve organizational culture,” resulting in “deeper theoretical understanding and practical knowledge concerning the improved function of organized activity, particularly schooling” (p. 10).

Extra Effort in Organizations

Teacher extra effort in terms of organizational citizenship behaviors (OCBs) serves as the study’s proposed criterion variable. Reacting to studies that apparently debunked the claim that performance is related to job satisfaction, Bateman and Organ (1983) argued that performance should be defined more broadly than mere productivity to include “citizenship” behaviors that “lubricate the social machinery of the organization” (p. 588). They maintained that these behaviors were strongly related to job satisfaction because they were voluntary acts of reciprocation. Accordingly, employees who feel supported by the organization are more likely to engage in discretionary, prosocial citizenship behaviors that support the organization. Bateman and Organ found that the relationship between job satisfaction and citizenship behaviors was “considerably stronger than those typically reported between satisfaction and ‘performance’” (p. 592). Their findings, along with the work of Smith, Organ, and Near (1983), ignited interest in the determinants and, especially, outcomes associated with this new category of extra effort in terms of citizenship behaviors.

From the very beginning, defining the nature of organizational citizenship behavior (OCB) as extra-role behavior not accounted for by in-role performance has proved difficult. Smith, Organ, and Near (1983) found two distinct dimensions of OCB: Altruism aimed at helping specific individuals (OCB-I) in the organization and Generalized Compliance aimed at supporting the organization as a whole (OCB-O). While leader supportiveness influenced OCB-I only indirectly through its effect on job satisfaction, leader supportiveness influenced OCB-O directly. Even though Organ (1997) reduced his original five dimensions of OCB to *helping*, *courtesy*, and *conscientiousness*, LePine, Erez, and Johnson (2002) argued that most of the dimensions of OCB “are highly related to one another and that there are no apparent differences in relationships with the most popular set of predictors,” leading LePine et al. (2002) to conclude that OCB appears to be a latent construct “redefined as a general tendency to be cooperative and helpful in organizational settings” (p. 61).

While many studies continue to differentiate extra effort based on the nature of the acts, others distinguish extra effort based on their intended targets. Noting findings similar to Smith, Organ, and Near (1983), Williams and Anderson (1991) categorized earlier dimensions of OCB as either OCBI, those directed toward individuals, or OCBO, those directed toward the organization as a whole, and found that the two types of OCBs were not only distinct from one another, but distinct from in-role behaviors both in terms of supervisory evaluations and their antecedents. Organ (1997) largely accepted Williams and Anderson’s conceptualization of OCB and re-defined OCB as “performance that supports the social and psychological environment in which task performance takes place” (p. 95).

Regardless of the specificity of the OCB construct, OCB-related research has expanded rapidly over the past 25 years. In their meta-analysis, Podsakoff, Whiting, Podsakoff, and Blume (2009) examined over 650 articles on OCB and related constructs, with nearly 66% of these articles appearing in the past decade. While much of the research continues to explore the dimensions of OCB (Bell & Menguc, 2002; Hoffman, Blair, Meriac, & Woehr, 2007; Hui, Lee, & Rousseau, 2004), researchers have also investigated potential predictors and effects of OCB. For instance, studies have analyzed the relationship between OCB and potential predictors, such as personality traits (Borman, Penner, Allen, & Motowidlo, 2001), employee attitudes (Bateman & Organ, 1993) and leadership behaviors (Pillai, Schriesheim, & Williams, 1999; Podsakoff, MacKenzie, Moorman, & Fetter, 1990). Others have examined the relationship between OCB and potential outcomes, such as individual performance (MacKenzie, Podsakoff, & Fetter, 1993; MacKenzie, Podsakoff, & Paine, 1999), team performance (Dunlop & Lee, 2004), and organizational effectiveness (Koys, 2001).

School-based Studies of Teacher Extra Effort

Despite the expansion of the scope of OCB-research, very few studies have examined extra effort in schools, including just a handful of studies conducted in the United States. Nevertheless, the past decade's mix of qualitative and quantitative approaches has yielded a good number of preliminary findings about the nature, determinants, and outcomes of teacher extra effort.

Defining extra effort in schools. In its early stages, research of teacher extra effort has struggled with defining the construct. Some studies of teacher extra effort have found little distinction between extra effort directed at individuals (OCBI) and extra

effort directed at the school (OCBO) and have, therefore, treated as teacher extra effort as a unified construct (DiPaola & Hoy, 2005; DiPaola & Tschannen-Moran, 2001; Yilmaz & Tasdan, 2009). These studies tend to use extra-effort scales that measure the global extra effort of the school, without analyzing different types of extra-effort behavior. They suggest that, at least in the public sector, helping individuals and helping the organization merge under the school mission to help students instead of increasing productivity or profits. Although types of teacher extra effort may appear similar in nature despite their targeted beneficiaries, social exchange theory supports distinguishing teacher extra effort by the beneficiaries of the effort (Koh, Steers, & Terborg, 1999). While teachers who feel supported by leadership may be more willing to support the school as a whole in return, teachers who feel supported by their colleagues but not by school leadership may be less likely to support the organization as a whole even though they are very likely to support their colleagues. By conflating all beneficiaries of teacher extra effort, school-wide measures obscure the reciprocity between particular elements of the school and thus obscure the power of teacher behavior to affect particular school outcomes related to the organization, other teachers, and students.

A growing number of studies in education have sought to identify the types of teacher extra effort based on intended beneficiary, following the lead of Williams and Anderson's (1991) distinction between OCBI and OCBO in the private sector. Surveying 251 Israeli teachers at 13 elementary schools, Somech and Drach-Zahavy (2000) identified three types of teacher extra effort directed at the student, team, and organization and developed a three-level teacher-OCB scale. They also found positive correlations between teacher extra effort and job satisfaction, teacher efficacy, and

collective efficacy. While they found a moderate positive relationship between collective efficacy and extra effort towards the team, they found no significant relationship between collective efficacy and extra effort towards students or the organization itself. The three-dimension OCB scale for teacher extra effort has been refined by the work of Bogler and Somech (2005) and Belogolovsky and Somech (2009). Working with German teachers, Christ, van Dick, Wagner, and Stellmacher (2003) verified these three types of teacher extra effort and concluded that organizational identification contributes to differences in extra effort. Similarly, Oplatka (2006) identified four extra effort domains (student, classroom, staff, schoolwide) through 70 interviews with teachers, supervisors, and principals. Student-oriented extra effort included *caring for a student in distress* and *proactive attentiveness to students* while staff-oriented extra effort included *professional assistance* and *emotional assistance and attentiveness* of colleagues. Moreover, teacher extra effort directed at different beneficiaries appears to have different educational outcomes. Oplatka (2009) found that Israeli teachers who engaged in extra effort reported individual outcomes related to their personal well-being, group outcomes expressed through positive feedback from multiple stakeholders, and organizational outcomes reflected by an improved school climate.

School culture and teacher extra effort. Although school-based studies continue to operationalize teacher extra effort, some studies have explored the antecedents and consequences of teacher extra effort. One early study found that transformational leadership accounted for a significant amount of compliance behavior, organizational commitment, and satisfaction with the leader in a sample of 846 teachers in 89 schools in Singapore (Koh, Steers, & Terborg, 1995). Using an open-ended survey of 50 Israeli

elementary and secondary teachers, Oplatka (2009) identified personal determinants related to concern for others and the profession, school-climate determinants related to collegiality and a sense of belonging, and leadership determinants, including “change initiative, positive feedback, democratic leadership style, and emotion-based leadership” (p. 410). Interviewing kindergarten teachers and their supervisors in Israel, Oplatka and Stundi (2011) discovered that organizational support and work autonomy combined with a teacher’s caring disposition to promote two types of teacher extra effort: professional extra effort related to instruction and other instructors, and interpersonal extra effort related to the well-being of children, their families, and the community.

Although Bogler and Somech’s (2005) findings did not distinguish between types of teacher extra effort, they did find positive relationships between the components of empowerment and all three types of extra effort (i.e., student, team, and organization) identified by Somech and Drach-Zahavy (2000). Of the 983 teachers in 25 junior and 27 high schools in Israel, teachers who reported higher levels of participation in decision-making, professional growth, status, self-efficacy, autonomy, and impact in the school also reported higher levels of extra effort. Overall, empowerment also partially mediated the relationship between participation in decision-making and teacher extra effort. Using the same Israeli sample, Somech and Bogler (2002) had reported no differences among teachers based on gender, education, or length of tenure, and Bogler and Somech (2004) found that three components of empowerment—decision-making, self-efficacy, and status—explained 40 percent of the variance in teacher extra effort. Thus, the more confident and respected teachers felt as they participated in deciding the future of their schools, the more they reported being involved in discretionary behaviors that supported

the missions of their schools. Moreover, while teachers involved in technical decisions about instruction exhibited higher levels of professional commitment, teachers involved in managerial decisions about school policy and budget allocations, for instance, exhibited higher levels of organizational commitment (Somech & Bogler, 2002). The centrality of efficacy beliefs and status in all of Bogler and Somech's (2004) analyses indicates that these variables are crucial to a principal's efforts to increase teacher commitment and extra effort.

Other studies have revealed the importance of flexible, supportive school cultures for improved teacher performance. Somech and Drach-Zahavy (2004) found that school cultures that foster organizational learning explained twice as much of the variance in extra effort towards the organization than variance in extra effort towards individuals in a sample of 450 staff members in 36 Israeli elementary schools. While the extent to which the school "established structural and procedural arrangements" for the collection, analysis, documentation, and dissemination of information was significantly related to and predicted both types of extra effort, organizational learning values of accountability and use of valid information were only positively related to extra effort toward the organization. Thus, encouraging teachers to work towards shared goals in an open and flexible environment appears to promote extra effort.

Expanding professional roles for teachers within a collegial environment appears to promote teacher extra effort. In two studies surveying 1874 public school teachers in Ohio and Virginia, DiPaola and Tschannen-Moran (2001) found a strong association between teacher extra effort and school climate defined as collegial principal leadership, academic press, and teacher professionalism. Teacher professionalism and academic

press, especially among high school teachers, were most highly correlated with teacher extra effort, suggesting that leaders who want to promote extra effort should promote teaching as a profession with high academic standards. Yilmaz and Tasdan (2009) found a moderate positive relationship between teachers' perceptions of organizational citizenship and organizational justice in Turkish primary schools. Teachers who were more likely to report that they were treated fairly in their schools were also more likely to report higher levels of involvement in school-related extra effort. Similarly, Christ et al. (2003) found that the degree to which teachers identified with teaching, their team, and their organization positively predicted their self-reported involvement in extra effort to varying degrees. These studies suggest that greater autonomy and empowerment for teachers are related to increased teacher extra effort. In fact, DiPaola, and Hoy (2005) recommended that "principals should develop an organizational structure and school culture that helps teachers do their jobs unfettered by bureaucratic rules and procedures" (p. 43). Nevertheless, the apparent outcomes associated with teacher extra effort are barely examined.

Extra effort and student achievement. A few studies have explored the connection between extra effort and student outcomes. DiPaola and Hoy (2005) found a significant, positive association between faculty extra effort and student achievement in both reading and mathematics in 97 high schools in Ohio, even when controlling for school SES. Although DiPaola and Hoy (2005) did not explore how a teacher's extra effort affects student achievement. Jimmieson, Hannam, and Yeo's (2010) findings suggest that teachers' extra effort is positively associated with student-teacher relations. In their study of teachers and students in 55 primary schools in Australia, Jimmieson et

al. (2010) examined the relationship between teacher extra effort, personal teacher efficacy, and student perceived quality of life of the school. The students' quality of life of the school measured their general positive feelings towards the school, which appear to reflect their perceived effectiveness of their classroom experiences. Jimmieson et al. (2010) found that students in classrooms with more confident teachers reported higher levels of school satisfaction, better student-teacher relations, more optimistic future expectations, and less psychological distress. Unexpectedly, neither school SES nor student-directed extra effort was related to personal teacher efficacy. Personal teacher efficacy was, however, positively associated with extra effort related to professional development and school-wide activities, and personal teacher efficacy facilitated the relationship between involvement in professional development activities and favorable student outcomes while extra effort directed at the organization had a direct, positive effect on student-teacher relations. Jimmieson et al. (2000) surmised that the low variability exhibited in student-directed extra effort might suggest the teachers' reluctance to admit shortcomings in relation to these types of behaviors.

Several studies recommend that more research should address the determinants of teacher extra effort (Oplatka & Stundi, 2011) and more specifically the relationship between school leaders and teacher extra effort (Yilmaz & Tasdan, 2009). Nevertheless, very few studies have examined the relationship between leadership styles and extra effort, not to mention teacher extra effort. In a Tanzanian study comparing the effects of TL and transactional leadership on 545 primary teachers in 70 schools, Nguni, Slegers, and Denessen (2006) confirmed that TL accounted for a greater amount of variance in job satisfaction and teacher extra effort than did transactional leadership. The TL behaviors

explained significant amounts of variance in value commitment, extra effort, and job satisfaction. Individually, only the *charismatic leadership* dimension of TL had a significant effect on commitment and extra effort. Neither *individualized consideration* nor *intellectual stimulation* explained any variance in these outcomes. These insights into the individual dimensions of TL, however, may be threatened by the multicollinearity of the leadership behaviors.

Summary

Decades of research in non-school contexts reveal that transformational leadership behaviors and extra effort are related to favorable organizational outcomes associated with increased capacity and enhanced commitment. More recently, preliminary findings from a far less extensive set of studies predominately outside of the United States suggest that transformational leadership influences favorable school conditions and student outcomes under conditions of reform and restructuring. Far less is known, however, about the variables that intervene in the relationship between TL and school outcomes, especially the relationship between TL and favorable teacher behaviors, such as teacher extra effort. Moreover, since most of the studies in schools have used a global TL construct or global extra-extra construct, very little is known about how specific TL behaviors relate to specific teacher mediators or outcome behaviors.

The available research suggests that TL is conducive to favorable school conditions that affect student and teacher outcomes. Transformational leaders indirectly affect student engagement through their direct effects on favorable organizational and classroom factors. Students in schools with transformational leaders also tend to exhibit higher levels of student achievement. Additionally, studies indicate that transformational

school leaders have beneficial effects on teachers' commitment to change as teachers in schools with transformational leaders were more likely to participate in professional learning and professional development activities.

Examining a potentially crucial psychological mechanism in the relationship between organizational factors and student achievement, numerous studies have highlighted the significance of teacher agency beliefs. Both collective teacher efficacy and teacher context beliefs have been shown to mediate the effects of school factors on student achievement, even rivaling the detrimental effects of low socio-economic status. Additionally, a few studies also suggest that these academic gains are associated with teachers' willingness to put for extra effort and that leaders can affect their teachers' extra effort by using strategies that involve them in school decisions and promote feelings of empowerment and efficacy.

CHAPTER 3

METHOD

In order to help explain how principals motivate teachers to adopt and sustain restructuring efforts, this quantitative study examined the relationship between teachers' perceptions of principals' transformational leadership (TL) behaviors, teachers' self-reported agency beliefs, and teachers' perceptions of school-wide extra effort. Furthermore, where possible, the effects of specific perceived principal TL behaviors (i.e., *setting directions*, *developing people*, *redesigning the organization*, and *improving the instructional program*) were compared, along with the effects of school characteristics such as *lower socioeconomic status (lower SES)*, the *percentage of minority students*, and *past mastery* experiences in terms of previous success on high-stakes tests.

Research Questions

In order to examine those relationships, this study addresses three broad research questions:

- Question 1 How are the specific types of perceived principal TL behaviors—*setting directions*, *developing people*, *redesigning the organization*, and *improving instruction*—related to one another and to the components of self-reported teacher agency beliefs and perceived school-wide teacher extra effort under conditions of high-stakes accountability?

Question 2 How are teacher characteristics such as age and experience and school characteristics such as school SES, percentage of minority students, and past master experiences related to perceived principal TL behaviors, self-reported teacher agency beliefs, and perceived school-wide teacher extra effort?

Question 3 To what extent do principal TL behaviors and teacher and school characteristics account for individual differences in self-reported teacher agency beliefs and perceived school-wide teacher extra effort?

Research Hypotheses

The following hypotheses emerge from the literature in relation to the research questions. The first set of hypotheses related to Question 1 addresses the associations between the major study variables. Next, the second set of hypotheses addresses additional associations between the major study variables and the exogenous school variables. Finally, the third set of hypotheses addresses the explanatory power of the model and the nature of its relationships.

Hypothesis 1. All four types of perceived principal TL behaviors—*setting directions, developing people, redesigning the organization, and improving instruction*—are positively and significantly correlated with both intervening teacher agency variables—*collective efficacy beliefs* and *context beliefs*—and with perceived school-wide teacher *extra effort*.

Hypothesis 1a. Behaviors related to *redesigning the organization* are more strongly correlated with teachers' self-reported *context beliefs* than are the other three types of leadership behaviors.

Hypothesis 1b. Behaviors related to *improving instruction* are more strongly correlated with self-reported *collective efficacy beliefs* and perceived teacher *extra effort towards students* than are the other TL behaviors.

Hypothesis 1c. Teacher agency beliefs are positively and significantly correlated with each other and with perceived school-wide teacher *extra effort*.

Hypothesis 2. The exogenous variables (i.e., *lower SES*, *percentage of minority students*, and *past mastery*) have significant associations with the major study variables.

Hypothesis 2a. A school's *lower SES* and *percentage of minority students* are significantly and negatively associated with teacher agency beliefs and perceived school-wide teacher *extra effort*.

Hypothesis 2b. *Past mastery* experience on high-stakes tests is significantly and positively associated with teacher agency beliefs and perceived school-wide teacher *extra effort*.

Hypothesis 3. The perceived transformational leadership behaviors and the exogenous school characteristics account for a significant amount of variance in self-reported teacher agency beliefs and perceived school-wide teacher *extra effort*.

Hypothesis 3a. The two variables associated with teacher agency beliefs mediate the effects of transformational leadership on perceived school-wide teacher *extra effort*.

Hypothesis 3b. Teacher *context beliefs* mediate the effects of TL on *collective teacher efficacy*.

Hypothesis 3c. TL behaviors have greater direct effects on *context beliefs* than they do on *collective teacher efficacy beliefs*.

Hypothesis 3d. Behaviors related to *improving instruction* have greater direct effects on *collective teacher efficacy beliefs* and greater overall effects on *extra effort towards students* than

do the behaviors related to *setting directions, developing people, or redesigning the organization*.

Hypothesis 3e. *Lower SES and the percentage of minority students have significant, negative effects on teacher agency beliefs and teacher extra effort.*

Hypothesis 3f. *Past mastery experiences on high-stakes tests have significant, positive effects on teacher agency beliefs and teacher extra effort.*

Data

In order to test the hypotheses, data were collected from teachers in multiple high schools experiencing restructuring efforts in the state of Texas. The following sections describe the data collection procedures, the nature of the sample, the research design, and the statistical procedures that were used to analyze the data.

Data Collection Procedures

After the Internal Review Board at the researcher's institution approved the survey and research procedures, applications to conduct external research were sent to 27 ISDs in the state of Texas. Twelve ISDs gave their consent for the study to be conducted. Depending on the nature of the district approval, introductory emails (see Appendix B) were either sent to school high school principals, who disseminated them to the teachers, or emailed directly to high school teachers, using addresses provided by the districts. Combined, approximately 7805 teachers received the email invitation to participate in the

study. The introductory email explained the purpose of the study and the significance of the study, informed the recipient of his or her rights and protections, estimated the amount of time the survey would take to complete (15 minutes), and specified the date by which the survey should be completed. High school teachers who agreed to participate in the anonymous, confidential survey clicked the link within the email to access the online survey administered by SurveyMonkey.com. The email invitation was used to remind teachers of the survey's deadline during data collection, which lasted two weeks from the time the introductory email was sent to each school principal or teacher. In addition to the survey data, the most recent information for teacher and school characteristics at both the district and state levels was gathered from the Texas Education Agency's (TEA) and the National Center for Education Statistics' (NCES) online resources.

Participants

To test the effects of transformational leadership in high schools experiencing high-stake accountability reform, full-time high school teachers from 12 urban independent school districts (ISDs) in Texas were invited to participate in the study. Designated as major urban, 6 of the districts served the six metropolitan areas of Texas with county populations exceeding 775,000 people and with more than 35% of the students identified as economically disadvantaged (Texas Education Agency, 2012). Economically disadvantaged students are those who receive free or reduced meals under the National School Lunch and Child Nutrition Program or other public assistance. The other six districts, considered Major Suburban, were contiguous to the major urban districts.

While the overall total teacher response rate was 18.9% ($N=1475$) with an average of 13.9 respondents per school, the teacher response rate for completed surveys was 17.8% ($N=1403$) with an average of 14.6 respondents per school. Using a similar method of recruitment, Leithwood and Jantzi (2006) reported comparable teacher response rates of 20.4% and 20.3%. The method used to calculate the response rate in this survey is very conservative because it includes all of the teachers who could have received the email invitation while the actual number of teachers, however, who received the invitation could be much lower. In other words, teachers might not have received the direct email or principals might have failed to send the invitation to all of the teachers on record for their schools. Regardless, the sample of 1,403 teachers was more than sufficient to conduct the statistical tests, including structural equation modeling (SEM). According to von der Heidt and Scott (2007), SEM requires a ratio of at least five responses per free parameter (i.e., variance, covariance, or regression coefficients). The largest measurement model in this study estimated a total of 156 free parameters, requiring a minimum sample of 780. Three of the four models, with free parameters ranging from 124 to 140, also met the upper recommended sample size of 10 participants for every free parameter (Schreiber, Stage, King, Nora, & Barlow, 2006).

Table 3.1 compares the teacher characteristics of the achieved sample to those of the target population. While the target population includes only those districts included in the sample, teacher characteristics could not be disaggregated at the high-school level because such separate data were unavailable. Thus, although the sample reflects higher percentages of male teachers (37.0%, $n=502$) and teachers with advanced degrees (45.4%, $n=635$) than the target population does, the target population includes

Table 3.1 Comparison of Teacher Characteristics of the Sample and Target Population

Teacher Characteristics	Sample	Target Population
Number of FTE	1403	7805
Gender ^a		
% Female	63.0	75.7
% Male	37.0	24.3
Race/Ethnicity ^b		
% Minority	40.3	57.5
% Am. Indian or Alaska Native	2.5	0.3
% Asian	2.5	1.6
% Black or African American	14.5	18.6
% Hispanic	26.3	36.7
% Native Hawaiian and other Pacific Islander	0.6	0.2
% White	59.7	42.5
Experience		
Age	43.3	
Total Years Teaching	13.6	11.7 ^c
% with 5 or Fewer Years Teaching	17.7	34.8 ^c
Years at Current School	7.8	
% with Advanced Degree	45.4	29.2 ^c

^a N = 1355; 3.4% (n = 48) did not respond to the question.

^b N = 1377; 1.9% (n = 26) did not respond to the question; Race/Ethnicity % totals 106.1% because 5.7% (n = 78) chose 2 or more responses.

^c PEIMS Snapshot 2011 <ritter.tea.state.tx.us>

elementary and junior high school teachers in addition to the high school teachers represented by the sample. Thus, the sample of high school teachers used in the study might actually reflect higher proportions of male teachers and teachers with advanced degrees than reported in this district-level data. On the other hand, the sample appears to significantly overrepresent White teachers (59.7%, $n = 822$) and underrepresent Black (14.5%, $n = 200$) and Hispanic (26.3%, $n = 356$) teachers when compared to racial/ethnic composition of the target population, which was calculated as a weighted average based on the racial/ethnic compositions of the actual respondents' districts. That is, this expected racial/ethnic composition of the target population was calculated as the sum of each district's racial/ethnic composition multiplied by the number of participants from each district. The most recent state data, however, reveal a racial composition range for Major Urban and Major Suburban districts that is closer to the actual sample's composition: 55% White, 7-17% Black, and 24-35% Hispanic (TEA, 2011).

Table 3.2 compares the average characteristics of the schools in the sample to those of the schools in the target population. The range for each school characteristic reveals a considerable amount of variance. While the sample's average school SES (59%) and average student-teacher ratio (15.1) are almost identical to those of the target schools (60.3% and 15.5, respectively), the percentage of minority enrollment in the sample schools (89.6%) is slightly higher than the target schools' percentage of minority enrollment (80%). Information on the average size of high schools in Major Urban and Major Suburban ISDs was unavailable.

Table 3.2 Comparison of School Characteristics of the Sample and Target Population

School Characteristics	Sample	Range		Target ^a
		Min	Max	
SES (% FRL)	59.0	6.9	95.7	60.3
% Minority	89.6	40.1	99.8	80
School Size	1908	195	4500	
Student-Teacher Ratio	15.1	9.0	19.4	15.5

^a PEIMS Snapshot 2011 <ritter.tea.state.tx.us>

Research Design

This quantitative study employed a cross-sectional questionnaire to measure respondents' self-reported perceptions of principal leadership behaviors, their own agency beliefs, and their perceptions of school-wide extra effort. Both research and theory guided the selection of TL behaviors as predictors, agency beliefs as intervening variables, and different types of teacher extra effort as criterion variables because of their apparent influence on student achievement. Additionally, numerous school and teacher characteristics were included in the study. These demographic variables were selected based on empirical research. Teacher-efficacy research has revealed the potential influence of teacher gender and experience (Klassen & Chiu, 2010), teacher race (Goddard & Skrla, 2006), and school SES and past achievement (Tschannen-Moran & Barr, 2004; Goddard et al., 2000). Research on collective efficacy has also demonstrated the interactions of SES, gender, and age (Fernandez-Ballesteros, Diez-Nicolas, Caprara, Barbaranelli, & Bandura, 2002). Other studies on principal leadership have shown the

influence of school size (Hallinger, 2003; Kruger et al., 2007) and student minority composition (Kruger et al., 2007).

Exogenous variables. The study included several variables whose values were independent of the other variables' values. These characteristics regarding past student achievement, school SES in terms of the percentage of students on free and reduced lunch, school size, the percentage of minority students, and overall faculty demographics were collected from the most recent online school data published by the TEA. Additionally, the first eight questions of the survey provided information about the faculty demographics of the sample. In addition to identifying their districts and schools, teachers provided data about their gender, race, and experience. These data were used to compare the characteristics of the sample to the target population and to interpret findings since several of the variables related to experience (i.e., *age, total years teaching, years at the current school, and educational level*) could be related to teacher agency beliefs.

Major study variables. In addition to the eight questions about teacher characteristics, the survey consisted of four pre-existing Likert-type instruments that define four constructs: the principal's *total school leadership* (TSL), *collective efficacy beliefs* and *context beliefs* that contribute to teacher motivation in the form of teacher agency beliefs, and teacher's *organizational citizenship behaviors* (OCB) that reflect teacher extra effort. All of the constructs are based on individual teacher's perceptions. Table 3.3 lists the Likert-based constructs, their corresponding sub-scales, and number of items appearing on the survey for each.

Transformational leadership. This study used Leithwood's (2012) Total School Leadership instrument (See Appendix C) to measure the teacher's perceived

Table 3.3 Constructs, Sub-scales, and Number of Survey Items

Constructs	Sub-scales	Number of Items
Total School Leadership (TSL)		20
	Direction Setting	4
	Developing People	9
	Redesigning the Organization	4
	Improving Instruction	7
Teacher Agency Beliefs		24
	Efficacy Beliefs (CTE)	12
	Context Beliefs (ESS)	12
Teacher Extra Effort (OCB)		14
	Extra Effort—Student (OCBS)	6
	Extra Effort—School (OCBO)	8
Total Survey Items		66

transformational leadership behaviors of the principal. The 20-item, 6-point Likert-type scale is organized into four sub-scales that reflect the degree to which the teacher perceives that the principal’s leadership style embodies four core transformational behaviors: *direction setting*, *developing people*, *redesigning the organization*, and *improving instruction*. Responses to the stem “To what extent do you agree or disagree that your school’s principal(s)” are anchored at *strongly disagree* and *strongly agree*.

Direction setting items include such statements as “gives staff a sense of overall purpose,” *developing people* items include such statements as “promotes leadership development among teachers,” *redesigning the organization* items include such statements as “ensures wide participation in decisions about school improvement,” and *improving the instructional program* items include such statements as “regularly observes classroom activities.” Using two separate samples in Canada and the Netherlands, Leithwood and Jantzi (2006) reported acceptable reliability coefficients (Cronbach’s alphas) for all three TL sub-scales: *setting directions*, .81 and .82; *developing people*, .85 and .84; and *redesigning the organization*, .80 and .78. The reliability coefficients (Cronbach’s α) for the overall scale were also acceptable at .90 and .88. Individual teacher scores for principal leadership consisted of an average score for each of the four dimensions as well as an overall *TSL* average.

Teacher agency beliefs. For this study, two separate Likert-type scales measured teacher agency beliefs. One measured the teacher’s beliefs about the *collective teaching efficacy* of the school, and the other measured the teacher’s beliefs about the supportive nature of the administrative *context*.

Efficacy beliefs. Perceptions about collective teacher efficacy (CTE) reflect the teacher’s beliefs about the efficacy or capabilities of the teachers in the school. This study used Goddard’s (2002) Collective Teacher Efficacy Short Form (See Appendix D) to measure the degree to which a teacher perceives that the teachers in the school are capable of improving the academic achievement of their students. The 12-item, 6-point Likert-type scale is anchored at *strongly disagree* and *strongly agree*, following the common stem “Please indicate your level of agreement with each of the following

statements about your school.” The instrument measures both group competence and task analysis, using positively and negatively phrased items. Items related to analysis of the task of teaching include such positively worded statements as “The opportunities in this community help ensure that these students will learn” and such negatively worded statements as “The lack of instructional materials and supplies in this school makes teaching very difficult.” Similarly, items related to the competence of the overall faculty include such positively worded statements as “Teachers in this school are well prepared to teach the subjects they are assigned to teach” and such negatively worded statements as “Teachers here don’t have the skills needed to produce meaningful student learning.” Principal axis factor analysis of the 12 items extracted a single factor that explained 64.10% of the variance with an eigenvalue of 7.69 and high internal consistency of .94 (Goddard, 2002). The individual teacher CTE score is the average of the 12 responses for that teacher.

Context beliefs. Perceptions about the supportive nature of the school’s structure reflect the teacher’s context beliefs. This study used Hoy and Sweetland’s (2001) Enabling School Structures (ESS) scale (See Appendix E) to measure the individual teacher’s perceptions of how supportive the environment is to the teacher’s efforts. The 12-item, 5-point Likert-type scale measures the degree to which a teacher perceives that the organizational environment either enables or hinders the work of teachers. Higher scores reflect more supportive environments in terms of bureaucratic structure and rules-based decision-making. Responses to the stem “Please indicate how often each of the following occurs” are anchored at *never* and *always*. The scale includes items related to bureaucratic structure, such as “The administrative hierarchy of this school obstructs

innovation,” and items related to adherence to rules, such as “Administrative rules in this school are substitutes for professional judgment.” Principal-axis factor analyses in two separate studies returned a single-factor solution with factor loadings from .40 to .81 and strong internal reliability ($\alpha = .94$) and a single-factor solution with factor loadings from .53 to .81 and strong internal reliability ($\alpha = .96$) (Hoy & Sweetland, 2001). The individual teacher’s *context beliefs* were calculated as the average for all 12 responses to the ESS, which included an average score for the 6 items related to *rules* and an average for the 6 items related to *structures*.

Teacher extra effort. This study used the organizational citizenship behaviors (OCB) scale developed by DiPaola and associates (2001, 2005) to measure the degree to which a teacher perceives that the faculty in the school engages in extra effort. The 12-item, 6-point Likert-type instrument (See Appendix F) measures collective teacher OCB. Responses to the stem “Please indicate your level of agreement with each of the following statements about your school” are anchored at *strongly disagree* and *strongly agree*. Items include “Teachers help students on their own time” and two reverse-scored items like “Teachers give excessive amounts of busy work.” Three separate studies have returned high to excellent reliability coefficients, $.86 \leq \alpha \leq .93$ (DiPaola, Tartar, & Hoy, 2005). In order to test whether OCB directed at students (OCBS) differ from those directed at the organization (OCBO), two additional student-directed items were added to the survey: “teachers stay after school hours to help students with class materials” and “teachers prepare special assignments for higher and lower level students.” The individual teacher OCB score is the average of all 14 responses for that teacher while

OCBS was the average of the 6 items directed at students and OCBO was the average of the 8 items directed at the organization.

Self-report methodology. The cross-sectional self-report methodology is an appropriate design for testing hypotheses about workers' perceptions about their jobs (Spector, 1994). Reviews of studies using such methodology have revealed that the construct validity coefficients of self-reports tend to surpass those of other measures, including expert judge ratings and behavioral measures (Howard, 1994) and that claims about the biases associated with common method variance (CMV) tend to be oversimplified and exaggerated (Spector, 2006).

Research has shown that some leadership behaviors appear to affect the entire group while others affect individuals to varying degrees. Seltzer and Bass (1990) found that subordinate extra effort did not appear at the leader-group level. They reasoned that the degree to which individuals were willing to put forth extra effort varied according to their experiences with the leader. Because group-level analysis failed to explain additional variance in extra effort, they concluded, "effort is primarily a leader-individual rather than a leader-group effect" (p. 701). Similarly, Walumbwa, Wang, Lawler, and Shi (2004) found similar results for perceptions of both collective efficacy and transformational leadership. Intra-class analyses did not warrant aggregating either of these perceptions, especially perceptions of leadership. School-based studies have also shown that individual teacher perceptions of principal behaviors are reliable indicators of differences in instructional practices (Hallinger, 2011; Quinn, 2002) and differences in student achievement (Andrews & Soder, 1987; O'Donnell & White, 2005).

In the case of teacher efficacy beliefs, teachers appear to evaluate their past experiences differently (Adams & Forsyth, 2006). Even though they might work within the same context, individual teachers can vary significantly on how they evaluate the contributions of past mastery, vicarious experience, and sources of social persuasion—all of which contribute to efficacy beliefs according to Bandura (1997). Furthermore, compared to elementary schools, high schools tend to be sub-divided into diverse groups with varying goals and purposes. Such disparate experiences could contribute to within-school differences in teachers' perceptions of leadership, agency, and effort.

Data Analysis

As soon as the online survey closed for the final school district, the survey data from SurveyMonkey was downloaded into IBM's Statistical Package for the Social Sciences 20 (SPSS). School characteristics (i.e., SES, *school size*, *percentage minority students*, *student-to-teacher ratio*, and *past mastery*) from online databases were included in the SPSS database. Once the data were compiled, statistical assumptions related to missing data, normality, and outliers were evaluated and addressed using SPSS 20, and the major study variables were calculated as the average of responses for each construct's items. Cronbach alpha coefficients were also calculated using SPSS 20 to assess the internal consistency of the measures.

SPSS 20 was then used to calculate the means and standard deviations for each of the study variables. This study used the results of the descriptive analyses to compare the characteristics of the research sample to the parameters of the target teacher population in terms of race, gender, and level of educational attainment. Comparative means tests were used to determine whether teacher characteristics affected survey results. Independent

sample t tests were used to compare mean ratings of female teachers to those of male teachers while one-way analyses of variance (ANOVAs) were used to compare the mean ratings based on either educational level or race and ethnicity. When appropriate, variable means and standard deviations were used to compare the results to similar findings in other studies.

As indicated in Table 3.4 below, a series of statistical procedures were used to address the research questions. For Research Question 1, SPSS 20 was used to calculate the bivariate correlations of the major study variables. Similarly, SPSS 20 was used to calculate the bivariate correlations between the major study variables and teacher and school characteristics in order to address Research Question 2. Values for Pearson's r tested hypotheses about the relationships between specific variables and helped specify competitive models for comparison in order to address Questions 3. Particularly strong correlations between variables recommended potential pathways not already specified in the theoretical model while weak or non-significant correlations helped rule out proposed pathways in theoretical model.

In order to address Question 3, general causal models had to be identified, modified, and compared. This study's cross-sectional tests do not provide necessary and sufficient grounds to evaluate causation; however, the models test necessary grounds for causation and are called *general causal models*. The procedure for evaluating general causal models using SEM involves five broad stages (Bollen & Long, 1992). First, the researcher specifies a model based on theory and past research. Bollen and Long (1992) recommend starting with a "strong substantive theory" by which to compare the results (p. 127). Next, the process of identification determines whether the model's parameters

Table 3.4 Statistical Procedures Used to Address Research Questions

Question	Statistical Procedure	Interpretation
Questions 1 Correlations of the Major Study Variables	Bivariate Correlations	Examine Pearson's Coefficient (r) $.01 \geq r \geq .19$, no or negligible $.20 \geq r \geq .29$ weak positive $.30 \geq r \geq .39$, moderate positive $.40 \geq r \geq .69$, strong positive $.70 \leq r$, very strong positive
Question 2 Correlations between Exogenous and Major Study Variables	Bivariate Correlations	Examine Pearson's Coefficient (r) Same as for Question 1.
Question 3 Effects of School Characteristics and Leadership Behaviors on Teacher Agency & Extra Effort	Visual SEM	Step One: Model Fit Evaluate Goodness of Fit Statistics Chi-squared (χ^2) test; relative χ^2 ; RMSEA < .05 with CI and PCLOSE; CFI, TLI, & NFI > .90 Step Two: Structural Analysis Compare Signs and Size of Estimates Compare Coefficients of Determination INDIRECT Test of Multiple Mediation

have unique values. Third, the parameters are estimated based on one of several estimation procedures. Once the estimates are calculated, the researcher evaluates the model's overall fit. Finally, if the researcher determines that the model is inconsistent with the data, the researcher can improve the model's fit through a process of respecification, repeating the above steps until a good fit is achieved.

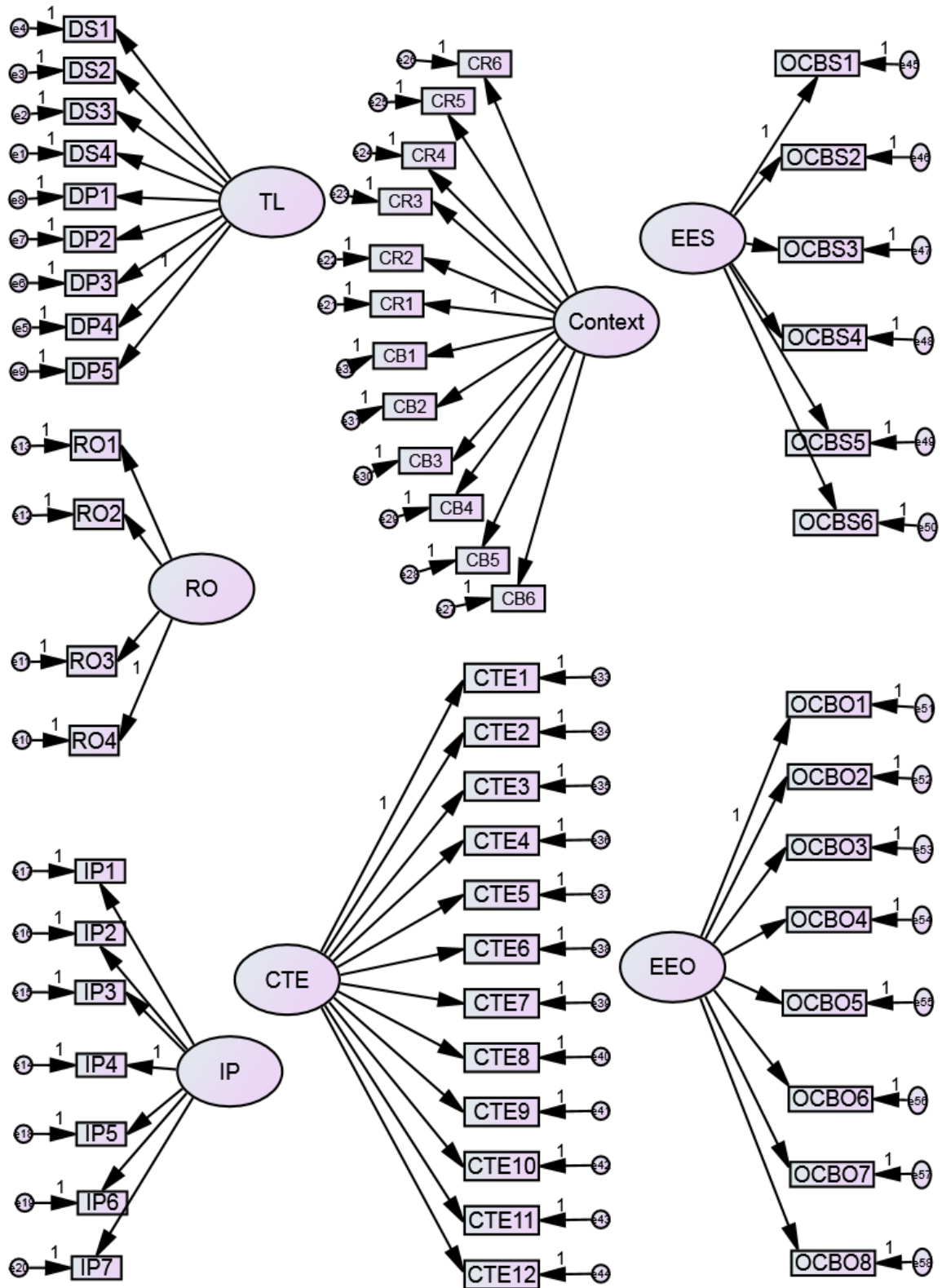
Once the overall model was specified based on theory as well as empirical research, the model's fit had to be evaluated. Each general causal model consists of a measurement model (Figure 1) and a structural model (Figure 2), which includes pathways between latent variables. Thus, the evaluative process follows the two-step rule (Blunch, 2008). First, the measurement model was identified through confirmatory factor analysis (CFA). Then the structural models were extended from the measurement model, identified, and evaluated.

For step one, CFA was used to test the measurement model for construct validity using AMOS 21 to perform maximum likelihood (ML) estimation in SEM (Arbuckle, 2012; Blunch, 2008). Assuming normal distributions of the variables, ML-estimation is favored for its consistency and asymptotic qualities (Blunch, 2008). According to Thompson (2004), factor analysis can help address the construct validity question: "Does the tool produce scores that seem to measure intended dimensions?" (p.4). CFA, in particular, is used when researchers have theoretical expectations about the number of factors, which items reflect each factor, and the correlations of the factors (Tabachnick & Fidell, 2007; Thompson, 2004). Thus, CFA helped determine whether the combination of instruments used in the study fit the data obtained from the sample of teachers in the United States.

AMOS (Analysis of Moment Structures) performs structural equation modeling (SEM), also known as analysis of covariance structures or causal modeling, by displaying parameter estimates graphically on an inputted path diagram that serves as a model specification (Arbuckle, 2012). SEM combines the ability to simultaneously examine multiple equations involving numerous endogenous variables, measure errors in both indicators and endogenous variables, estimate the reliability and validity of latent constructs, and specify latent-variable structural relationships (Bollen & Long, 1992). In visual SEM the model is specified graphically: small rectangles represent the survey items, which serve as indicators used to reflect the underlying latent variables of the model, represented by circles.

Figure 1 provides an illustration of a measurement model with seven latent variables such as TL and CTE indicated by the large circles. Circles are used to depict all variables that are not directly observed, including error variables, which reflect measurement error as well as all other variables not specified in the model that affect the latent variable. Thus, by including the error variable, SEM measures all variables on which the predicted variables depend (Arbuckle, 2012). Represented by small rectangles, the survey items, such as DS1 and CTE1, serve as indicators for the latent variables. During CFA, single-headed arrows connect indicators to latent variables as specified by theory, some error terms may correlate, and some parameters may be constrained (Blunch, 2008). While single-headed arrows represent linear dependencies with regression weights, double-headed arrows (omitted in Figure 1) represent correlations between variables and terms. In order for the model to be identified, one factor loading for each scale must be constrained to 1.

Figure 1. Example of a Measurement Model in Visual SEM



Double-headed arrows connecting the latent variables have been omitted for the sake of clarity.

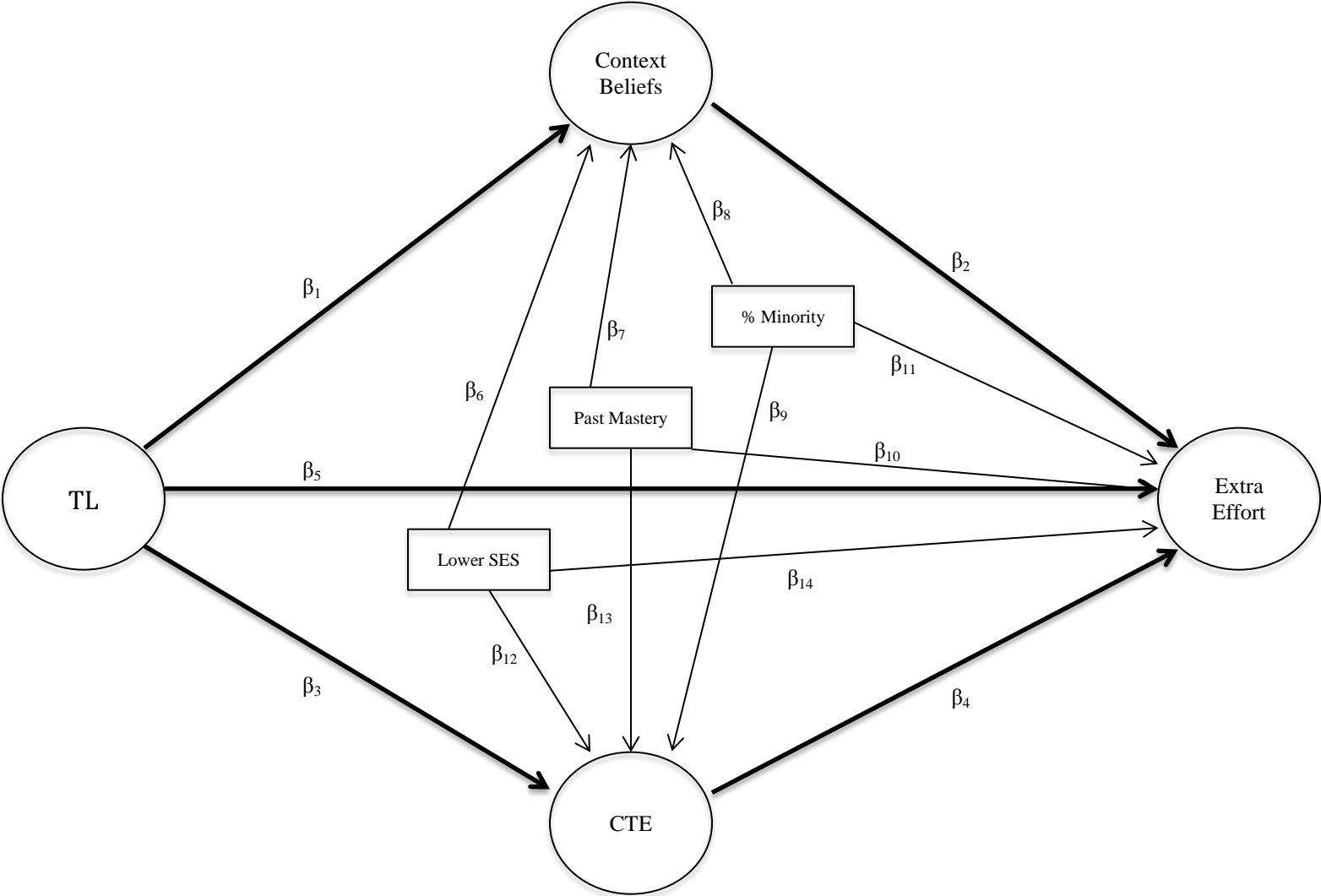
To evaluate model fit, the chi-squared (χ^2) statistic should only serve as a general guide, strengthened by additional goodness-of-fit measures of various types and a close analysis of the components of the model, including the coefficients of determination (R^2), coefficients, and estimate signs. Unlike most testing procedures in which the alternative hypothesis (H_1) is the preferred description of the data, SEM uses a reverse testing procedure in which the null hypothesis (H_0) represents an acceptable fit (Blunch 2008). The H_0 for the χ^2 -test states that the discrepancy between covariances of the model-implied population and the covariances of the actual observed sample is zero (Barrett, 2007). Thus, a significant χ^2 test indicates that the model does not fit the model-implied covariances and should be rejected. However, since sample size magnifies the discrepancy in this χ^2 “exact fit” test, large sample sizes are likely to result in a significant χ^2 test results.

Because this study used a large sample size ($N = 1403$), the χ^2 -test was expected to result in the rejection of the H_0 . Thus, a series of fit indices were employed to evaluate the measurement model. In addition to the χ^2 statistic, Kline (2010) recommends using the Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI), and Blunch (2008) adds the relative χ^2 statistic (the ratio of the χ^2 statistic to degrees of freedom) and PCLOSE as indicated in Table 3.4. The relative χ^2 statistic (CMIN/DF) adjusts the χ^2 statistic to sample size by dividing the statistic by its degrees of freedom and PCLOSE substitutes for p by indicating a “close fit” test when $RMSEA < 0.05$ (Browne & Cudeck, 1993). Using these fit indices along with other baseline measures, acceptable fit of the measurement model with the data was indicated by a relative χ^2 of less than 5 (Byrne, 1998; Marsh, Hau, & Wen, 2004); a RMSEA of less than

0.08, but preferably less than 0.05 (Browne & Cudek, 1993); and a Tucker-Lewis index (TLI), a normed fit index (NFI) (Bentler & Bonett, 1980), and a comparative fit index (CFI) (Bentler, 1990) of 0.90 or above. Incremental fit indices, such as the normed fit index (NFI), indicate the degree to which the hypothesized model stands between the independent model, which indicates terrible fit, and the saturated model, which indicates perfect fit. Thus, an NFI of .90 indicates that the hypothesized model is 90% of the way between the two extreme models (Arbuckle, 2012). One parsimony fit index, the Parsimony Goodness-of-Fit index (PGFI) was included because it penalizes models for complexity (Hooper, Coughlan, & Mullen, 2008). Additionally, the Adjusted Goodness of Fit Index was reported for historical comparisons (Hooper et al., 2008) although this fit measure has fallen out of favor.

After two measurement models (Models 1 and 2) were identified and modified to achieve acceptable fit and SPSS was used to address all of the statistical assumptions related to SEM, step two involved comparing different several structural models with their accompanying measurement models to evaluate the effects of leadership and school variables on teacher agency and teacher extra effort. As exemplified by Figure 2, directional arrows between variables serve to graphically describe each hypothesized SEM. Exogenous variables like *past mastery* and the *percentage of minority students* have no single-headed arrows directed at them although they can be correlated with other exogenous variables with double-headed arrows. Endogenous variables like CTE, on the other hand, have single-headed arrows directed at them. Following McDonald and Ho (2002), direct connections between two variables are called *arcs* while a sequence of arcs between two variables is called a *path*. The standardized structural coefficients (β),

Figure 2. Example of a Structural Model in Visual SEM



associated with single-headed arrows, measure the direct effects of arcs between variables while indirect effects are the products of these structural coefficients that compose the paths between predictors and the criterion variable (Fox, 1980). For example TL's direct effect on *extra effort* is β_5 , while its indirect effects through the path including *context beliefs* only are equal to $\beta_1 \times \beta_2$. Finally, effect sizes are often given in terms of standardized units of *SD*. Thus, in the previous example, a 1*SD* increase in TL is associated with a β_5 *SD* direct increase in *extra effort* as well as a $(\beta_1 \times \beta_2)$ *SD* indirect increase through its effects on *context beliefs*. Including the measurement model in the general causal model improves the reliability of the measurements, compared to regression models, resulting in increased coefficients of determination.

To address the mediation hypotheses associated with Research Question 3, AMOS 21 was used to calculate the direct and indirect effects of TL behaviors by principals on teacher agency beliefs and teacher extra effort. One general causal model (Model 3) resulted from the first measurement model (Model 1), consisting of the study's major latent variables without any of their dimensions. For the second measurement model (Model 2) three general casual models (Models 4, 5, and 6) were used to evaluate the effects of TL as a composite measure of behaviors related to *direction setting*, *developing people*, and *redesigning the organization* compared to the effects of behaviors related to *improving instruction* on teacher agency beliefs and various types of extra effort. The variance-covariance matrix of each model was analyzed using the maximum likelihood method of AMOS 21, and path coefficients, estimate signs, and coefficients of determination for each model were used to compare models. Mediation hypotheses were evaluated using a four-step method. Baron and Kenny (1986) identified the prerequisites

for mediation. First, the predictor must have a significant effect on the mediator. Second, the predictor must have a significant effect on the outcome. Third, in the absence of the mediator, the predictor must have a significant direct effect on the outcome. Finally, the effect of the predictor on the outcome must diminish with the addition of the mediator. Preacher and Hayes' (2008) INDIRECT macro for SPSS was used to test the overall significance of the paths indicating indirect effects on extra effort. While the Sobel test can be used to test simple mediation models with single mediators (Preacher & Hayes, 2004), INDIRECT can be used to test mediation hypotheses with multiple potential mediators.

Compared to mere correlational and regression analyses, the combination of statistical tests used to address the study's research questions provides far greater understanding about how teachers' agency beliefs mediate the relationship between teachers' perceptions of principal leadership behaviors and their assessment of school-wide extra effort on the part of teachers. Understanding how principals motivate teachers to put forth extra effort during times of educational reform is essential to improved academic achievement because principals affect such school outcomes indirectly. Thus, evaluating how principal leadership behaviors work through teacher agency beliefs places the proper psychological mechanism at the center of change.

CHAPTER 4

RESULTS

After probing the descriptive statistics associated with the study variables, this chapter presents the statistical results of the study used to address the research questions and test their accompanying hypotheses. First, bivariate correlations were examined in order to evaluate the relational hypotheses associated with the first and second research questions. Next, visual structural equation modeling (SEM) was employed to evaluate the general causal models used to test the hypotheses associated with the third research question and thus extend analyses of research questions one and two.

Data Preparation

Survey responses were analyzed at the individual level using SPSS 20. Case screening was used to check for cases with significant missing responses and to check for outliers in school data. Similarly, variable screening was used to check for missing variable data. Median-value replacement was used for missing Likert-scale responses while district-level mean values were used to replace missing school data. Case and variable screening with the replacement of missing data resulted in 1,403 cases without missing values. SPSS 20 was then used to test the statistical assumptions of normality, homoscedasticity, multicollinearity, and linearity for the major study variables.

The major study variables met all of the statistical assumptions. Each variable's histogram revealed a good match with the normal curve, the absolute value of each normality value in Table 4.1 was under 1, and each of those values was not greater than 3

times its standard error. Additionally, tests for homoscedasticity were conducted by examining the scatterplots for the residuals of each predictor variable against changes in the predicted values for those variables (Gaskin, 2012c). In each case the error variance of the predictor was constant with varying values in that variable. Finally, regression analyses were conducted to test for multicollinearity of the predictors. With Variable Inflation Factors (VIF) under 3 (Gaskin, 2012a), both *total school leadership* (TSL) and *context beliefs* exhibited no problems with multicollinearity. Similarly, with an acceptable VIF equal to 3.02, *collective teacher efficacy* (CTE) beliefs exhibited no multicollinearity with the other predictors. Although the major study variables did not exhibit multicollinearity, the TSL subscales did exhibit multicollinearity. As recounted later, all of the relationships between predictors and predicted variables were linear.

Descriptive Statistics

SPSS 20 was used to calculate measures of central tendency for the major study variables as well as the school and teacher characteristics. Table 4.1 reports means, standard deviations, and reliability coefficients for the major study variables. All of the Cronbach's alphas were above .84, except the one for OCBS, which was .79. These scores reveal a high level of internal consistency for each of the study variables. As a measure of reliability for the scores of a particular sample, Cronbach's α reflects the degree to which an individual's score will be similar on different occasions (Streiner, 2003) and "estimates the proportion of test variance attributable to common factors among the items" (Cronbach, 1951). While the lower reliability coefficient for OCBS ($\alpha = 0.79$) might be affected by its smaller number of items ($n = 6$), the particularly high internal consistency for TSL ($\alpha = 0.98$) most likely reflects some redundancy in the scale

Table 4.1 Psychometric Properties of the Major Study Variables ($N=1403$)

Variable	M	SD	α	Range		Normality	
				Potential	Actual	Skew	Kurtosis
Total School Leadership (TSL)	4.20	1.22	.98	1-6	1-6	-0.50	-0.51
Direction Setting	4.26	1.31	.91	1-6	1-6	-0.64	-0.34
Developing People	4.14	1.39	.94	1-6	1-6	-0.55	-0.63
Redesigning Organization	4.21	1.24	.89	1-6	1-6	-0.53	-0.33
Improving Instruction	4.19	1.15	.92	1-6	1-6	-0.47	-0.39
Teacher Context Beliefs	3.51	0.87	.93	1-5	1.17-5	-0.38	-0.46
Flexible Rules	3.38	0.86	.84	1-5	1-5	-0.27	-0.44
Supportive Structure	3.66	0.93	.88	1-5	1-5	-0.47	-0.41
Collective Teacher Efficacy (CTE)	3.89	0.74	.85	1-6	1.17-6	0.03	-0.01
Extra Effort (OCB)	4.44	0.74	.90	1-6	1.15-6	-0.41	0.51
Extra Effort—Students (OCBS)	4.66	0.75	.79	1-6	1.17-6	-0.55	0.49
Extra Effort—Organization (OCBO)	4.22	0.87	.87	1-6	1-6	-0.33	0.25

(Streiner, 2003). Part of the strength of the reliability coefficient for TSL, however, could be a result of its higher number of items ($n = 20$).

Although the schools in the sample varied considerably in size of student enrollment, overall they exhibited considerably less variability in minority composition, SES, and past mastery experiences on high-stakes testing. Table 4.2 provides a summary of means, standard deviations, and ranges for school and teacher characteristics. The high schools in the sample exhibited a high level of variance in school size as measured by student enrollment ($M = 1908$, $SD = 867$). Moreover, the figures clearly show that on average the schools in the sample displayed a high *percentage of minority students* ($M = 89.57$, $SD = 14.18$), a moderately low *SES* reflected by the high percentage of students on free and reduced lunch ($M = 58.96$, $SD = 23.00$), and a relatively modest *past mastery* on high-stakes testing over the past three years ($M = 1.17$, $SD = .56$). On the TEA Accountability System, this score reflects that the average rating based on performance on high-stakes testing was *academically acceptable*, the lowest of three acceptable school ratings.

Summary of Responses to Survey Items

Because the main purpose of this study is to test the effects of a principal's TL behaviors on teacher agency beliefs and teacher extra effort, the following narrative description of the teachers' responses to specific survey items highlights patterns and extremes in those responses. More detailed accounts of the teachers' responses to the items for each instrument can be found in accompanying Tables 4.3-4.6, including the means and standard deviations for each item.

Table 4.2 Descriptive Statistics for School and Teacher Characteristics

Variable	<i>N</i>	<i>M</i>	<i>SD</i>	Range	
				Min	Max
School Variables					
School Enrollment	1403	1908	867	195	4500
SES (FRL%) ^a	1403	58.96	23.00	6.9	95.7
% Minority	1403	89.57	14.18	40.1	99.8
Student-Teacher Ratio	1403	15.08	1.58	9.0	19.40
Past Mastery	1403	1.17	0.56	0	3
Teacher Variables					
Total Years Teaching ^b	1389	13.58	7.97	0	25+
Years at Current School ^c	1390	7.75	6.20	0	25+
Age ^d	1384	43.4	11.33	22.0	70+

^a SES was calculated as the percentage of students on Free and Reduced Lunch (FRL).

^b 0.9% (*n* = 13) did not provide their total years teaching. 12.7% (*n* = 178) selected 25+ for their total years teaching.

^c 1.0% (*n* = 14) did not provide their number of years at the current school. Only 2.1% (*n* = 29) of the respondents selected 25+ for their years at current school

^d 1.4% (*n* = 19) did not provide their age. Only 0.1% (*n* = 2) of the respondents selected 70+.

Item responses to the TSL scale. The Total School Leadership (TSL) scale mean indicates that teachers in the study expressed weak levels of agreement that their principals' demonstrated transformational leadership behaviors (*M* = 4.20 on the 6-point Likert scale). Table 4.3 reports descriptive statistics for item responses related to the TSL

Table 4.3 Descriptive Statistics for Item Responses Related to the Total School Leadership Scale
($M = 4.20$; $N = 1403$)

Measures	Item	M	SD
<i>Direction Setting</i>	4 Items	4.26	1.31
	1. Gives staff a sense of overall purpose.	4.23	1.54
	2. Helps clarify the reasons for your school's improvement initiatives.	4.26	1.42
	3. Provides useful assistance to you in setting short-term goals for teaching and learning.	3.90	1.51
	4. Demonstrates high expectations for your work with students.	4.66	1.38
<i>Developing People</i>	5 Items	4.14	1.39
	5. Gives you individual support to help you improve your teaching practices.	3.92	1.59
	6. Encourages you to consider new ideas for your teaching.	4.34	1.45
	7. Models a high level of professional practice.	4.37	1.52
	8. Develops an atmosphere of caring and trust.	3.97	1.67
	9. Promotes leadership development among teachers.	4.11	1.53
<i>Redesigning the Organization</i>	4 Items	4.21	1.24
	10. Encourages collaborative work among staff.	4.64	1.33
	11. Ensures wide participation in decisions about school improvement.	3.85	1.59
	12. Engages parents in the school's improvement efforts.	4.21	1.34
	13. Is effective in building community support for the school's improvement efforts.	4.14	1.43
<i>Improving Instruction</i>	7 Items	4.19	1.15
	14. Provides or locates resources to help staff improve their teaching.	4.09	1.47
	15. Regularly observes classroom activities.	4.13	1.46
	16. After observing classroom activities, works with teachers to improve their teaching.	3.84	1.54
	17. Frequently discusses educational issues with you.	3.83	1.54
	18. Buffers teachers from distractions to their instruction.	3.74	1.52
	19. Encourages you to use data in your work.	4.84	1.16
	20. Encourages data use in planning for individual student needs.	4.82	1.14

scale. Compared to other types of principal TL behaviors, teachers reported higher levels of agreement on *direction setting* behaviors ($M = 4.26$), followed by behaviors related to *redesigning the organization* ($M = 4.21$). Teachers reported that clarifying reasons for improvement initiatives ($M = 4.26$) and demonstrating high expectations for their work with students ($M = 4.66$) were the most apparent *direction setting* behaviors exhibited by their principals. Further, encouraging them to consider new ideas for their teaching ($M = 4.34$) and modeling high levels of professional practice ($M = 4.37$) were the most apparent *developing people* ($M = 4.14$) behaviors exhibited by their principals. On the other hand, teachers reported that principals gave relatively less individualized support for them as they improved their teaching practices ($M = 3.92$) and provided relatively less useful assistance to them in setting short-term goals for teaching and learning ($M = 3.90$). Nor did they perceive much evidence of principals ensuring wide participation in decisions about staff improvement ($M = 3.85$) in their efforts to *redesign the organization* ($M = 4.21$) although they did report that their principals encouraged collaborative work ($M = 4.64$).

This dichotomy of responses suggests that although teachers were more likely to report that their principals communicated school-wide goals and encouraged certain types of relevant behavior, they were less likely to report that their principals actively engaged them in hands-on practices related to meeting those goals. Using an almost identical transformational leadership scale that did not include *improving instruction* behaviors, Leithwood and Jantzi (2006) found a remarkably similar pattern of responses to the items related to these three types of transformational leadership behaviors.

In terms of principal behaviors related to *improving instruction* ($M = 4.19$), teachers reported relatively high levels of encouragement to use data in their work ($M = 4.84$) and to use data in planning for individual student needs ($M = 4.82$). In fact, these two items have the highest two means in the entire TSL scale and are significantly higher than the other *improving instruction* behaviors. On the other hand, teachers reported that they observed relatively less buffering from distractions to their instruction ($M = 3.73$) and relatively less personalized support for their instructional change in terms of principals working with them to improve their teaching ($M = 3.84$) or principals discussing educational issues with them ($M = 3.83$). Once again, the dichotomy in responses related to *improving instruction* suggests that principals were perceived as encouraging behavior but not otherwise actively supporting that behavior.

Item responses to the ESS scale. The Enabling School Structures (ESS) scale mean indicates that teachers in the study reported weak to moderate agreement that their school contexts were enabling ($M = 3.52$ on the 5-point Likert scale). Table 4.4 reports descriptive statistics for item responses related to teachers' *context beliefs* as measured by the ESS Scale. Overall, teachers reported that their schools exhibited considerably looser hierarchical structures ($M = 3.66$) than they exhibited flexible rules ($M = 3.38$). While teachers were less likely to report that the context was specifically supportive, they were far more likely to report that administrators or rules did not intentionally hinder their or their students' progress. Therefore, teachers saw rules as somewhat rigid ($M = 3.10$) and hindering ($M = 3.27$), yet they more strongly believed that the rules were generally not used to punish teachers ($M = 3.77$). Similarly, teachers saw little evidence that their administrators used their authority to enable teachers ($M = 3.39$), yet they more strongly

Table 4.4 Descriptive Statistics for Item Responses Related to the Enabling School Structures Scale
($M = 3.52$; $N = 1403$). Items 2, 4, 5, 8, 10, and 11 are reverse scored.

Measures		Item	<i>M</i>	<i>SD</i>
Rules	6 Items		3.38	.87
		1. Administrative rules in this school enable authentic communication between teachers and administrators.	3.43	1.14
		2. In this school red tape is a problem.	3.18	1.12
		3. Administrative rules help rather than hinder.	3.27	1.09
		4. Administrative rules in this school are used to punish teachers.	3.77	1.18
		5. Administrative rules in this school are substitutes for professional judgment.	3.50	1.22
		6. Administrative rules in this school are guides to solutions rather than rigid procedures.	3.10	1.16
Structure	6 Items		3.66	.93
		7. The administrative hierarchy of this school enables teachers to do their jobs.	3.61	1.12
		8. The administrative hierarchy of this school obstructs student achievement.	3.73	1.14
		9. The administrative hierarchy of this school facilitates the mission of the school.	3.62	1.07
		10. The administrative hierarchy of this school obstructs innovation.	3.62	1.23
		11. In this school, the authority of the principal is used to undermine teachers.	3.97	1.24
		12. The administrators in this school use their authority to enable teachers to do their jobs.	3.39	1.20

believed that administrators generally did not use their authority to obstruct student achievement ($M = 3.73$) or undermine teachers ($M = 3.97$). Once again, this dichotomy parallels the dichotomy of responses to perceived leadership behaviors in that it reflects a good-intentioned passivity on the part of the administration. While teachers felt that the administration did not intentionally interfere with their efforts, they also felt that the administration's rules and hierarchy could have been more enabling.

Item responses to the CTE scale. The Collective Teacher Efficacy (CTE) scale mean indicates that teachers in the study reported weak confidence in the ability of their colleagues to teach the students in their schools ($M = 3.89$ on the 6-point Likert scale). Table 4.5 reports descriptive statistics for item responses related to these *collective teacher efficacy* beliefs. The highest average responses reveal that teachers generally believed that their colleagues were skilled enough to teach their students ($M = 4.97$), that their schools provided safe environments ($M = 4.82$), and that their colleagues believed that their students could learn ($M = 4.64$), but they were also skeptical about their students' advantages at home ($M = 2.17$), their students' preparedness when they arrive at school ($M = 2.95$), and their students' opportunities in the community ($M = 3.06$). This dichotomy reflects greater confidence in what teachers have more control over. While the teachers reported moderate confidence in their colleagues' abilities and beliefs, they did not generally agree that factors outside the school assisted them in their endeavors. Thus, items that teachers appear to have less control over received lower ratings than those related to behaviors teachers appear to control. As discussed later, these items related to the students' home experiences and community support exhibited low factor loadings and were removed from the CTE construct during modifications for model measurement fit.

Table 4.5 Descriptive Statistics for Item Responses Related to the Collective Teacher Efficacy Scale ($M = 3.89$; $N = 1403$). Items 3, 4, 8, 9, 11, and 12 are reverse scored.

Item	<i>M</i>	<i>SD</i>
1. Teachers in the school are able to get through to the most difficult students.	3.87	1.13
2. Teachers here are confident they will be able to motivate their students.	4.12	1.11
3. If a child doesn't want to learn, teachers here give up.	4.42	1.17
4. Teachers here don't have the skills needed to produce meaningful student learning.	4.97	1.08
5. Teachers in the school believe that every child can learn.	4.64	1.12
6. These students come to school ready to learn.	2.95	1.30
7. Home life provides so many advantages that students here are bound to learn.	2.17	1.22
8. Students here just aren't motivated to learn.	3.51	1.27
9. Teachers in this school do not have the skills to deal with student disciplinary problems.	4.36	1.20
10. The opportunities in this community help ensure that these students will learn.	3.06	1.35
11. Learning is more difficult at this school because students are worried about their safety.	4.82	1.20
12. Drug and alcohol abuse in the community make learning difficult for students here.	3.77	1.42

Item responses to the OCB scale. The Organizational Citizenship Behaviors (OCB) scale mean indicates that teachers reported that they observed their colleagues engaged in a weak to moderate amount of extra effort in their schools ($M = 4.44$). Table 4.6 displays the descriptive statistics for item responses related to teacher extra effort in the form of *organizational citizenship behaviors* (OCBs). Teachers were somewhat more likely to report that teachers in their school engaged in *extra effort towards students* ($M = 4.66$) than *towards the organization* in general ($M = 4.22$). Specifically, teachers were more likely to report that teachers in the school assisted students on their own time ($M = 5.16$) and after school hours ($M = 5.05$), made good use of class time ($M = 4.61$), assisted new teachers ($M = 4.59$), and sponsored extracurricular activities ($M = 4.43$); however, teachers were far less enthusiastic about their colleagues' desire to serve on committees ($M = 4.05$), their productivity on committees ($M = 3.84$), and their support for substitutes ($M = 4.06$). The higher level of agreement with statements about extra effort towards students parallels their greater confidence in their colleagues' skill level and belief in students despite forces outside of their direct control. These three highest rated items, however, exhibited low factor loadings and were removed from the *extra effort* construct during modifications for model measurement fit.

Differences in Responses Based on Teacher Characteristics

A series of statistical tests was conducted in SPSS 20 to assess whether response means differed statistically based on gender, race/ethnicity, and level of education. Table 4.7 displays the independent sample *t*-test results for major study variables based on gender. Independent sample *t*-tests revealed a statistically reliable difference between the mean of *extra effort towards students* that female teachers reported ($M = 4.70$, $SD =$

Table 4.6 Descriptive Statistics for Item Responses Related to the Organizational Citizenship Behavior Scale ($M = 4.44$; $N = 1403$). Items 2 and 4 are reverse scored.

Measures		Item	M	SD
<i>Students</i>	6 Items		4.66	.75
		1. Teachers help students on their own time.	5.16	.91
		2. Teachers waste a lot of class time.	4.43	1.21
		3. Teachers begin class promptly and use class time effectively.	4.61	.98
		4. Teachers give an excessive amount of busy work.	4.23	1.21
		5. Teachers stay after school hours to help students with class materials.	5.05	.95
		6. Teachers prepare special assignments for higher and lower level students.	4.45	1.16
<i>Organization</i>	8 Items		4.22	.87
		7. Teachers voluntarily help new teachers.	4.59	1.19
		8. Teachers volunteer to serve on new committees.	4.05	1.20
		9. Teachers volunteer to sponsor extra-curricular activities.	4.43	1.18
		10. Teachers arrive to work and meetings on time.	4.36	1.12
		11. Teachers take the initiative to introduce themselves to substitutes and assist them.	4.08	1.21
		12. Teachers give colleagues advanced notice of changes in schedules or routine.	4.14	1.22
		13. Teacher committees in this school work productively.	3.84	1.28
		14. Teachers make innovative suggestions to improve the overall quality of our school.	4.30	1.15

Table 4.7 Independent Sample t-tests for Major Study Variables Based on Gender
($N = 1355$; $df = 1353$)

Variable	<i>M (SD)</i>		<i>t</i>	<i>p</i>
	Female	Male		
Total School Leadership	4.20 (1.20)	4.19 (1.26)	.262	.793
Direction Setting	4.28 (1.29)	4.24 (1.33)	.563	.573
Developing People	4.15 (1.36)	4.12 (1.43)	.338	.573
Redesigning the Organization	4.22 (1.21)	4.18 (1.28)	.559	.577
Improving Instruction	4.17 (1.14)	4.20 (1.16)	-.534	.577
Teacher Context Beliefs	3.53 (.838)	3.48 (.905)	1.071	.284
Flexible Rules	3.40 (.836)	3.33 (.902)	1.477	.140
Supportive Structure	3.67 (.903)	3.63 (.964)	.624	.532
Collective Teacher Efficacy	3.88 (.744)	3.88 (.734)	.090	.928
Teacher Extra Effort (OCB)	4.46 (.737)	4.40 (.739)	1.554	.120
Extra Effort—Students (OCBS)	4.70 (.742)	4.58 (.743)	2.920	.004 ¹
OCBS Item 1	5.22 (.885)	5.07 (.935)	2.886	.004 ¹
OCBS Item 4	4.34 (1.17)	4.05 (1.22)	4.453	.000 ¹
OCBS Item 5	5.10 (.933)	4.99 (.949)	2.105	.035 ¹
Extra Effort—School (OCBO)	4.23 (.872)	4.22 (.848)	.147	.884

¹ Significant at the $p < .05$ level.

.742) and the mean that male teachers reported ($M = 4.58$, $SD = .743$), $t(1353) = 2.952$, $p = .004$, $\alpha = .05$. Female teachers were more likely to report that teachers in their schools participated in *extra effort towards students*. Specifically, female teachers were more likely than male teachers to report that the teachers in their schools helped students on their own time (OCBS 1) and stayed after school to help students with class materials (OCBS 5). On the other hand, female teachers were less likely to report that teachers in their schools gave students excessive busy work during class (OCBS 4). These items are the same three *extra-effort* items omitted during fit modifications because of their low factor loadings. Other studies have found that the number of female teachers has a positive influence on perceptions of school culture (Kruger et al., 2007). For all other study variables, independent sample *t*-tests failed to reveal any statistically reliable differences between means based on gender (see Table 4.7). Although studies have shown differences in efficacy beliefs based on gender, those differences often arise in employment spheres that have historically favored men (Fernandez-Ballesteros et al., 2002). The fact that women have historically played a major role as teachers in K-12 education suggests that their efficacy beliefs should compare favorably to those of male counterparts within schools.

One-way ANOVAs revealed statistically significant differences between respondents based on racial/ethnic group status but not based on educational level. One test of variance showed that the effect of race/ethnicity on *extra effort towards the school* was significant, $F(5, 1371) = 2.90$, $p = .013$. A Tukey post-hoc test revealed that Pacific Islander teachers ($M = 3.47$, $SD = 0.71$) were significantly less likely to report that their colleagues were participating in *extra effort towards the school* than were Asian teachers

($M = 4.58$, $SD = 0.75$). On average, Pacific Islander teachers reported that their colleagues were less willing to serve on new committees (OCBO2) and less likely to give advanced notice of changes in schedule or routine (OCBO6). Given the extremely small number of Pacific Islander teachers (0.6%, $n = 8$), their less favorable responses to these two items had negligible effects on the overall mean. Although both Goddard et al., (2000) and Goddard and Skrla (2006) reported that in their studies minority teachers were more optimistic about their colleagues' capabilities than were their non-minority peers, minority teachers in this study did not exhibit higher levels of CTE. Additional analysis of variance revealed that the effect of a teacher's educational level on the study variables was not statistically significant.

Hypotheses Testing

In addition to an examination of the statistical assumptions and the investigation of patterns within the descriptive statistics, a series of statistical tests were conducted in order to address the hypotheses. In the following sections, the hypotheses are considered in order of the study's research questions.

Question 1 Hypotheses

Question 1. How are the specific types of perceived principal TL behaviors—*setting directions, developing people, redesigning the organization, and improving instruction* related to one another and to the components of self-reported teacher agency beliefs and perceived school-wide teacher extra effort under conditions of high-stakes accountability?

Hypothesis 1. All four types of perceived principal TL behaviors are positively and significantly correlated with both intervening teacher agency variables—*collective efficacy beliefs* and *context beliefs*—and with perceived school-wide teacher *extra effort*.

To test the correlational hypotheses related to Question 1, SPSS 20 was used to calculate bivariate correlations between the major study variables. Table 4.8 shows the correlation matrix for the major study variables and their dimensions. Hypothesis 1, above, was fully supported. All of the TL behaviors were significantly and positively correlated with the other major study variables, including teacher agency beliefs and perceptions about teacher extra effort. Combined, the four leadership behaviors (TSL) exhibited strong positive correlations with the teacher agency variable CTE ($r = 0.54, p < .001$) and teacher *extra effort* ($r = 0.49, p < .001$) and a very strong positive correlation with the other teacher agency variable, *context beliefs* ($r = 0.82, p < .001$).

Hypothesis 1a. Behaviors related to *redesigning the organization* are more strongly correlated with teachers' self-reported *context beliefs* than are the other three types of leadership behaviors.

Hypothesis 1b. Behaviors related to *improving instruction* are more strongly correlated with self-reported *collective efficacy beliefs* and perceived *extra effort towards student* than are the other TL behaviors.

Table 4.8 Summary of Correlations¹ for the Major Study Variables and Their Dimensions ($N=1403$)

Variable	Direction Setting	Developing People	Redesigning Organization	Improving Instruction	Context Beliefs	Flexible Rules	Supportive Structure	Collective Teacher Efficacy	Extra Effort	Extra Effort (Students)	Extra Effort (School)
Total School Leadership	0.97	0.97	0.96	0.95	0.82	0.78	0.80	0.54	0.49	0.35	0.54
Direction Setting	1.00	0.93	0.90	0.90	0.79	0.75	0.79	0.51	0.46	0.33	0.51
Developing People		1.00	0.90	0.90	0.82	0.78	0.81	0.51	0.45	0.30	0.51
Redesigning Organization			1.00	0.88	0.79	0.75	0.77	0.53	0.49	0.35	0.54
Improving Instruction				1.00	0.74	0.70	0.73	0.54	0.50	0.37	0.53
Teacher Context Beliefs					1.00	0.97	0.97	0.51	0.41	0.28	0.47
Flexible Rules						1.00	0.87	0.50	0.40	0.26	0.46
Supportive Structure							1.00	0.50	0.41	0.29	0.45
Collective Teacher Efficacy								1.00	0.66	0.58	0.64
Teacher Extra Effort									1.00	0.91	0.93
Extra Effort-Student (OCBS)										1.00	0.69
Extra Effort-School (OCBO)											1.00

¹All correlations are significant at the $p < 0.01$ level.

The correlations between the specific leadership behaviors and the other major study variables were very consistent with each other and their overall construct's correlations with the other variables. Thus, Hypotheses 1a and 1b, related to differences in the strengths of correlations between specific leadership behaviors and other variables, were generally not supported. Hypothesis 1a was not supported because behaviors related to *redesigning the organization* were not most strongly correlated with *context beliefs* ($r = 0.79, p < .001$) compared to the other leadership behaviors ($0.74 \leq r \leq 0.82, p < .001$). Similarly, while the behaviors related to *improving instruction* were most strongly correlated with both CTE ($r = 0.54, p < .001$) and *extra effort towards students* ($r = 0.37, p < .001$), the differences between the leadership behavior correlations with these two variables were not statistically significant, ($0.51 \leq r \leq 0.54, p < .001$) and ($0.30 \leq r \leq 0.37, p < .001$), respectively. Thus, Hypothesis 1b received nominal support at best. Although not anticipated, of all the leadership behaviors, those related to *improving instruction* were the least significantly correlated with *context beliefs* ($r = 0.74, p < .001$).

Hypothesis 1c. Teacher agency beliefs are positively and significantly correlated with each other and with perceived school-wide teacher *extra effort*.

As predicted in Hypothesis 1c, both components of teacher agency beliefs were positively and significantly correlated with one another ($r = 0.51, p < .001$) and with both types of extra effort. *Context beliefs* exhibited a weak, positive correlation with *extra effort towards students* ($r = 0.28, p < .001$) and a strong, positive correlation with *extra*

effort towards the school ($r = 0.47, p < .001$). The components of extra effort exhibited similar disparate correlations with the other major study variables: in all cases but one the correlations with *extra effort towards students* were significantly lower than those with *extra effort towards the school*. All of the leadership behaviors and the components of *context beliefs* exhibited weak to moderate ($0.26 \leq r \leq 0.37, p < .001$) correlations with *extra effort towards students* compared to their strong correlations with *extra effort towards the school* ($0.45 \leq r \leq 0.64, p < .001$). Only CTE exhibited consistent correlations with both types of extra effort.

Consistent with the hypothesized role of CTE as a mediator in the relationship between leadership behaviors and teacher extra effort (Hypothesis 3a), CTE exhibited a consistently higher strong positive correlation with both *extra effort towards students* ($r = 0.58, p < .001$) and *extra effort towards the school* ($r = 0.64, p < .001$) than did the other major study variables. Contrary to these findings, Somech and Drach-Zahavy (2000) found no relationship between collective efficacy beliefs and extra effort towards students. In their study of self-efficacy, Gibson and Dembo (1984) suggested that because high-efficacy teachers in their study devoted more class time to instruction and used less invasive disciplinary techniques, these teachers might not have seen a need to spend as much time outside of the classroom for instruction. In the present study, however, teachers who reported higher levels of confidence in their colleagues' abilities to teach their students also reported higher levels of school-wide *extra effort towards students*.

Question 2 Hypotheses

Question 2. How are teacher characteristics such as age and experience and school characteristics such as school SES, percentage of minority

students, and past master experiences related to perceived principal TL behaviors, self-reported teacher agency beliefs, and perceived school-wide teacher extra effort?

Hypothesis 2. The exogenous variables (i.e., *lower SES*, *percentage of minority students*, and *past mastery*) have significant associations with the major study variables.

Hypothesis 2a. A school's *lower SES* and *percentage of minority students* are significantly and negatively associated with teacher agency beliefs and perceived school-wide teacher *extra effort*.

To test the correlational hypotheses related to Question 2, SPSS 20 was used to calculate bivariate correlations between the major study variables and school and teacher characteristics as reported in Table 4.9. As predicted by Hypothesis 2, *lower SES*, the *percentage of minority students*, and *past mastery* were all significantly associated with the major study variables. More specifically, as predicted by Hypothesis 2a, *lower SES* and the *percentage of minority students* exhibited weak negative correlations with all of the major study variables. Moreover, while the *percentage of minority students* was also negatively correlated with all of the major variables' dimensions, only behaviors related to *improving instruction* and *extra effort towards students* failed to significantly correlate with *lower SES* although these correlations were still negative. The fact that these two school variables held similar correlations with the study's major variables is not

Table 4.9 Summary of Correlations Between School and Teacher Characteristics and the Major Study Variables

Variable	TSL	Direction Setting	Developing People	Redesigning Organization	Improving Instruction	Context Beliefs	Flexible Rules	Supportive Structure	Collective Teacher Efficacy	Extra Effort	Extra Effort (Students)	Extra Effort (School)
Lower SES (FRL%)	-.09*	-.07*	-.12*	-.12*	-.05	-.17*	-.16*	-.17*	-.14*	-.08*	-.03	-.11*
% Minority	-.15*	-.13*	-.16*	-.16*	-.11*	-.17*	-.15*	-.18*	-.21*	-.14*	-.10*	-.15*
3 Year Past Mastery	.13*	.12*	.14*	.13*	.11*	.17*	.16*	.16*	.26*	.10*	.09*	.09*
Total Years Teaching	-.01	-.01	-.03	-.02	.02	-.01	-.03	.02	.10*	.07*	.08*	.06**
Years at Current School	-.10*	-.09*	-.10*	-.11*	-.07*	-.10*	-.12*	-.08*	.01	.00	.01	-.01
Age	-.01	.01	-.03	-.01	.01	.02	-.00	.04	.11*	.11*	.11*	.10*

* These correlations are significant at the $p < 0.01$ level.

** These correlations are significant at the $p < 0.05$ level.

surprising given that a school's *lower SES* and the *percentage of minority students* exhibited a strong positive correlation ($r = .57, p < .001$).

Hypothesis 2b. *Past mastery* experience on high-stakes tests is significantly and positively associated with teacher agency beliefs and perceived school-wide teacher *extra effort*.

As expected in Hypothesis 2b, *past mastery* exhibited significant positive correlations with all of the major study variables, most notably CTE ($r = .26, p < .001$). According to social cognitive theory, these past mastery experiences serve as one of the four sources of efficacy information (Bandura 1997). Numerous studies (Cybulski et al., 2005; Goddard et al., 2000; Goddard & Skrla, 2006) have verified the positive associations between past mastery and CTE as well as the negative associations of lower SES with CTE and achievement (Cybulski et al., 2005; Hoy et al., 2002). However, some research has found no significant correlations between SES or the proportion of minority students and CTE (Goddard et al., 2000, Tschannen-Moran & Barr, 2004).

Although not hypothesized, other relationships are worth examining. School size ($M = 1919, SD = 867$) was weakly and negatively correlated with *lower SES* ($r = -.27, p < .01$) and 3-year *past mastery* ($r = -.11, p < .01$). Thus, as school size increased, schools tended to have a smaller proportion of their students on free and reduced lunch. Ironically, they also tended to have less success in terms of past mastery on high-stakes testing. School size did not, however, correlate with any of the leadership, teacher agency, or extra effort variables.

Also not hypothesized, correlations with teacher characteristics revealed an interesting difference between associations with *total years teaching*, on the one hand, and *years at the current school*, on the other. While *total years teaching* and age were not correlated with any of the leadership or context variables, both of these variables related to experience were slightly, positively correlated with CTE ($r = .10$, and $r = .11$, $p < .01$) and *extra effort* ($r = .07$ and $r = .11$, $p < .01$), respectively. Goddard and Skrla (2006) also found that more experienced teachers were more positive about collective efficacy than less experienced teachers were. On the other hand, *years at the current school* was not significantly correlated with either CTE or *extra effort*, but exhibited weak, negative correlations with TSL ($r = -.10$, $p < .01$) and *context beliefs* ($r = -.10$, $p < .01$). This finding corroborates other findings that suggest more experienced teachers are less optimistic about change. Fernandez-Ballesteros et al. (2002) found that while younger participants did not universally hold higher collective efficacy beliefs, they did judge themselves more capable of bringing about social change than their older counterparts. Negative experiences with leadership and administrative context that inhibited change in the past might make teachers who have been in the same context longer less optimistic about their abilities to bring about change while teachers who have not experienced those setbacks might appear more optimistic about change. Thus, whereas increases in overall experience appear to accompany greater levels of confidence in the ability of others, longer tenures in the same school appear to be associated with less optimism about the ability to bring about change because of the lack of support they believe they will receive. It is worth noting that many of the correlations between teacher characteristics and the

major study variables are negligible at best. Had the sample size and thus the power of the test been lower, many of these correlations might not have been significant at all.

Question 3 Hypotheses

Prior to an examination of the general causal models using ML-estimation in visual SEM, the assumptions for independence of observations and normality of predictors were addressed. Since each of the observations was independent, the distributional assumptions were considered. The exogenous variables—*lower SES*, *percentage minority*, and *past mastery*—can take any distributional shape as long as the remaining observed variables exhibit normal distributions and as long as the predicted variables depend linearly on the predictors. The normality of the study variables was demonstrated earlier (see Table 4.1), and curve estimation was used in SPSS 20 to test the linearity between all of the relationships in the model. In each case, the F-statistic for the linear model was significant and comparatively high enough to indicate that the relationships were sufficiently linear to be tested using a covariance based structural equation modeling algorithm (Gaskin, 2012b). In fact, in most cases the F-statistic for the linear model exhibited the highest value.

Identifying and fitting the measurement models. Before an evaluation of the structural models, two different measurement models were identified and modified to achieve appropriate fit with the data. Figure 3 shows the initial measurement model (Model 1) for the study's major study variables and three significant school variables. In addition to the combined leadership behaviors (TL), the model includes the two agency variables (i.e., beliefs related to *context beliefs* and *collective teacher efficacy* (CTE)) and

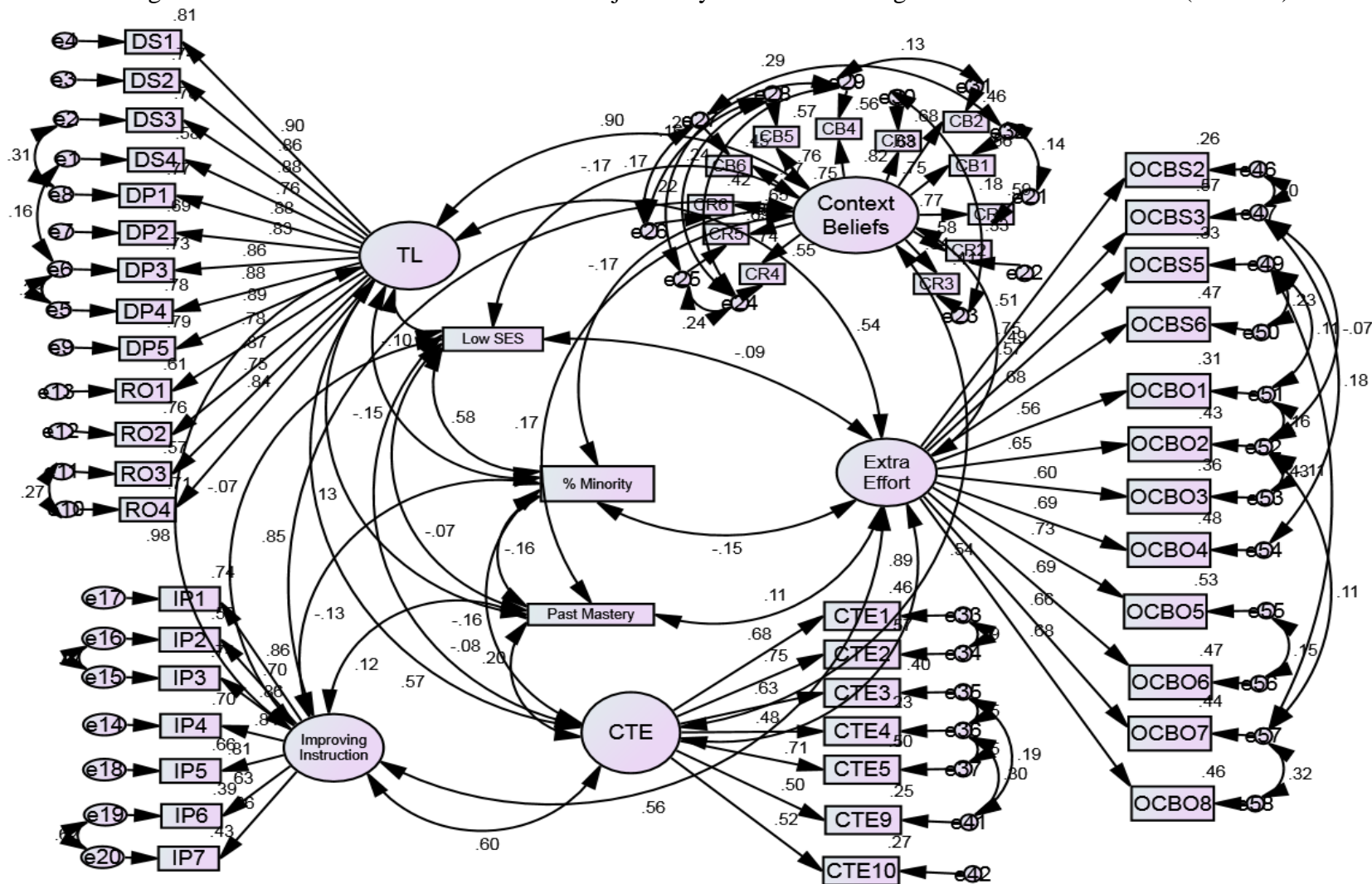
all teacher OCB items combined to reflect teacher *extra effort* (EE). Measurement Model 1 with 140 free parameters indicated a relatively poor fit with the data. Although the chi-squared statistic was expected to be significant because of the large sample size ($\chi^2 = 10074.97$, $df = 1751$, $p < .001$), other fit indices echoed the poor fit of the initial measurement model. The relative χ^2 (CMIN/DF) was 5.75, and the RMSEA = 0.058, 90% CI [0.056, 0.059], with PCLOSE = 0.00. Similarly, baseline comparisons (NFI = 0.84, TLI = 0.85, and CFI = 0.86) and a parsimonious baseline comparison (PCFI = 0.82) reflected poor fit, along with the historically relevant AGFI of 0.74.

Modifications to Model 1 based on theoretical concerns and empirical data resulted in a reduction of items and the covariance of some error terms on the same latent variables (Gaskin, 2010; Kenny, 2011). First, several items were removed because of their poor factor loadings of less than 0.50. While only OCBS1 (“Teachers help students on their own time”) and OCBS4 (“Teachers give excessive amounts of busy work”) were removed from the OCB scale, 4 CTE items exhibited factor loadings under 0.50. Compared to most of the remaining CTE items (*i.e.*, CTE1, CTE2, CTE3, CTE4, CTE5, and CTE9), whose stems focus on beliefs about teacher capabilities, these 4 items (CTE7, CTE8, CTE11 and CTE12) appear to be more related to teacher beliefs about students’ capabilities and the community. CTE7 (“Home life provides so many advantages that students here are bound to learn”), CTE11 (“Learning is more difficult in this school because students are worried about their safety”), and CTE12 (“Drug and alcohol abuse in the community make learning difficult for students here”) reflect beliefs about the broader community that teachers have far less control over. The resulting measurement model with 156 free parameters exhibited good fit with the data. Once again the chi-

square statistic was significant because of the large sample size ($\chi^2 = 4671.62$, $df = 1384$, $p < 0.001$). However, other absolute fit measures (CMIN/DF = 3.38 and RMSEA = 0.041, 90% CI [.040, .042] with PCLOSE = 1.00) exhibited good fit. Similarly, baseline comparisons (NFI = 0.92, TLI = 0.94, and CFI = 0.94), a parsimonious baseline comparison (PCFI = 0.88), and the historically relevant AGFI of 0.86 indicated good fit with the data.

In addition to this simplified measurement model, another measurement model was identified and modified to achieve appropriate fit with the data. Figure 4 shows the second measurement model (Model 2) for the study's major study variables and three significant school variables. In addition to the two agency variables (i.e., beliefs related to *context beliefs* and *collective teacher efficacy* (CTE)) and all teacher OCB items combined to reflect teacher extra effort (EE), this model includes two leadership variables. One leadership variable consisted of a combination of TL behaviors related to *setting directions*, *developing people*, and *redesigning the organization* while the other consisted of the more recently added behaviors related to *improving instruction*. Measurement Model 2 with 147 free parameters indicated a relatively poor fit with the data, and was only slightly better than the initial measurement model. Although the chi-squared statistic was expected to be significant because of the large sample size ($\chi^2 = 9868.70$, $df = 1744$, $p < .001$), other fit indices echoed the poor fit of the measurement model. The relative χ^2 (CMIN/DF) was 5.66, and the RMSEA = 0.058, 90% CI [0.056, 0.059], with PCLOSE = 0.00. Similarly, baseline comparisons (NFI = 0.84, TLI = 0.86, and CFI = 0.86) and a parsimonious baseline comparison (PCFI = 0.82) reflected poor fit, along with the historically relevant AGFI of 0.74.

Figure 4. Second Measurement Model for Major Study Variables and Significant School Variables (Model 2)



The second fit model resulted from very similar modifications. The same two OCB items directed at students (i.e., OCBS1 and OCBS4) and the same four CTE items (i.e., CTE7, CTE8, CTE11 and CTE12) were removed because of low factor loadings. CTE6 (“These students come to school ready to learn”) was also removed for low factor loading. The omission of this item makes sense as it also reveals a focus on students’ preparation at home, which is outside of the teachers’ immediate control. After correlations of many of the same error variables as those in Model 1, the resulting measurement model with 165 free parameters achieved good overall fit with the data. Once again the chi-square statistic was significant because of the large sample size ($\chi^2 = 4449.44$, $df = 1320$, $p < 0.001$). However, other absolute fit measures (CMIN/DF = 3.37 and RMSEA = 0.041, 90% CI [.040, .042] with PCLOSE = 1.00) exhibited good fit. Similarly, baseline comparisons (NFI = 0.92, TLI = 0.94, and CFI = 0.94), a parsimonious baseline comparison (PCFI = 0.87), and the historically relevant AGFI of 0.87 indicate good fit with the data. Table 4.10 compares the goodness of fit indices for these two measurement models.

Table 4.10 Goodness-of-Fit Comparison of Measurement Models

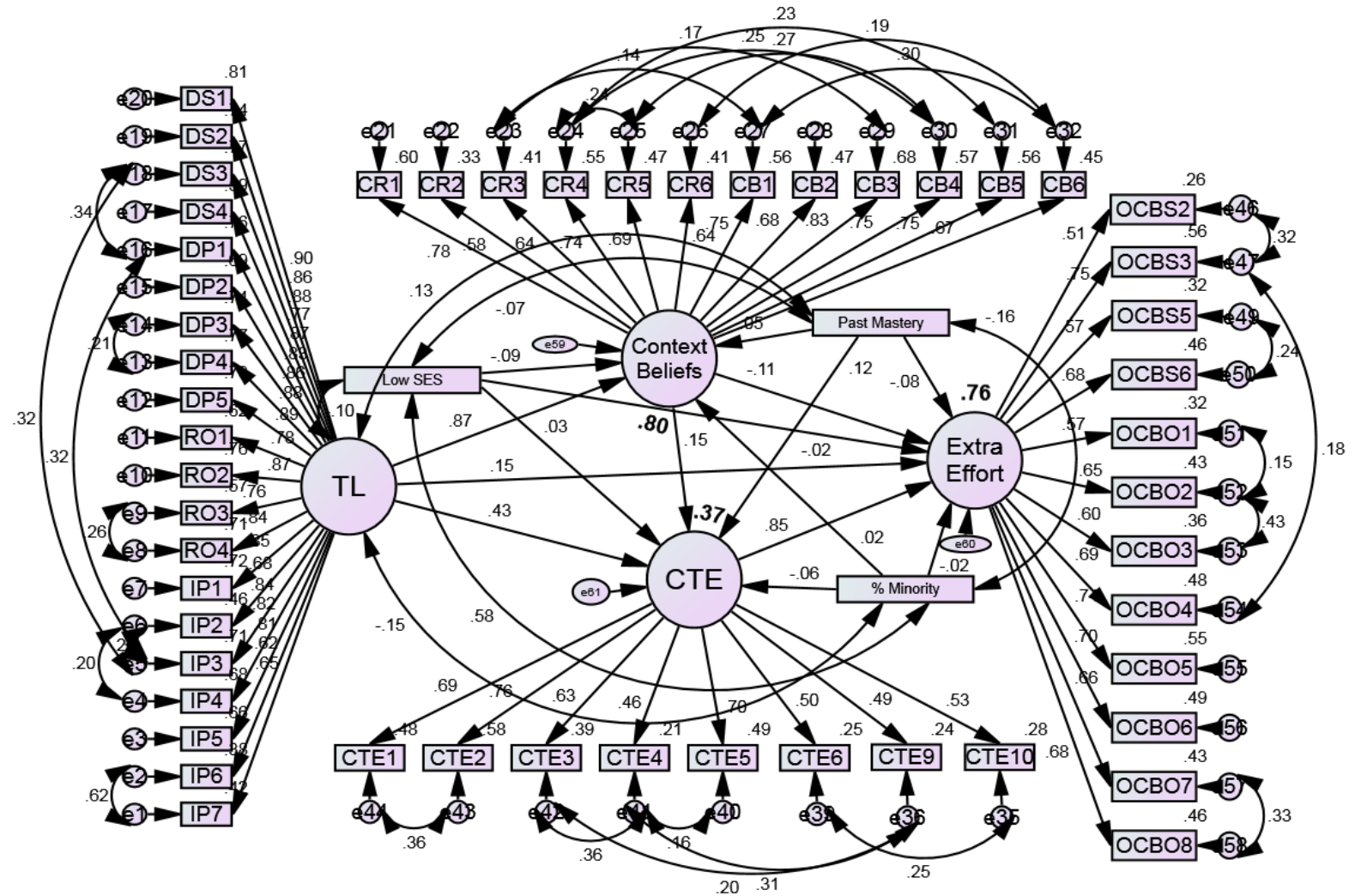
Measurement Model	CMIN (df)	P	CMIN/df	CFI	NFI	TLI	PCFI	RMSEA	PCLOSE
Unfit									
1	10074.97 (1751)	0.00	5.75	0.86	0.84	0.85	0.82	0.058	0.00
2	9868.70 (1744)	0.00	5.66	0.86	0.84	0.86	0.82	0.058	0.00
Acceptable Fit									
1	4671.62 (1384)	0.00	3.38	0.94	0.92	0.94	0.88	0.041	1.00
2	4449.44 (1320)	0.00	3.37	0.94	0.92	0.94	0.87	0.041	1.00

Evaluating the structural models. Once the two measurement models were identified, modified, and found to adequately fit the data, several general causal models were created by specifying structural pathways between variables according to theory and past empirical research. These general causal models were then used to test the hypotheses related to Question 3. After the evaluation of the hypotheses in relation to Model 1, only significant differences are addressed in the other structural models.

Question 3. To what extent do principal TL behaviors and teacher and school characteristics account for individual differences in self-reported teacher agency beliefs and perceived school-wide teacher extra effort?

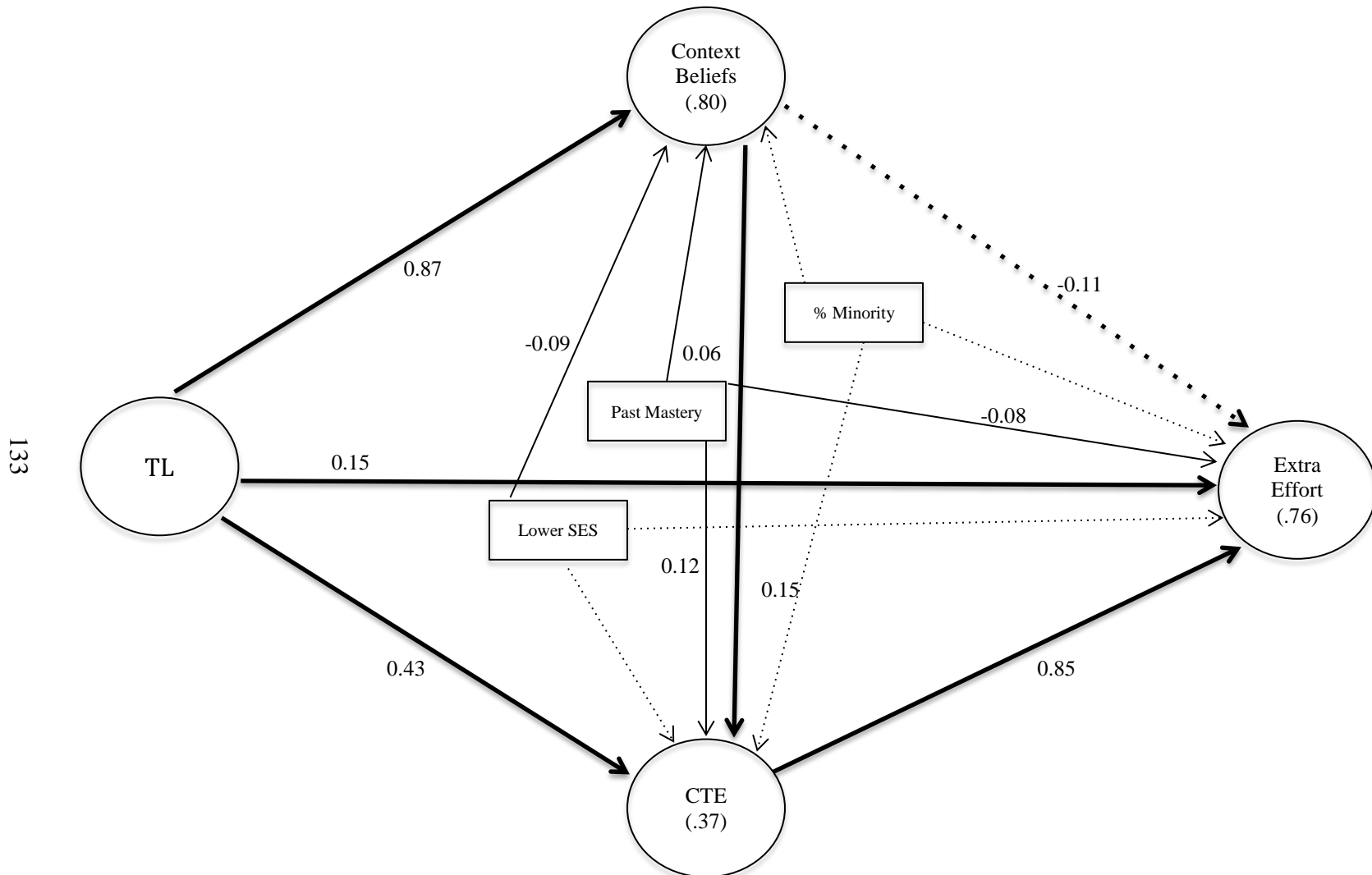
Figure 5 depicts the initial general causal model (Model 3a) with the study's major variables (i.e., *total school leadership* (TL), *context beliefs*, CTE, and overall *extra effort*), presented as composite latent variables and the three school variables (i.e., *lower SES*, the *percentage of minority students*, and *past mastery*) that appeared to have the most significant correlations with the study's major variables. AMOS 21 was used to perform the analysis based on data from 1403 teachers. For the sake of clarity, Figure 6 presents the structural model (Model 3b) without its accompanying measurement model. As predicted by Hypothesis 3 below, TL behaviors and school characteristics accounted for a significant amount of variance in self-reported teacher agency beliefs and perceived school-wide teacher *extra effort* in the initial general causal model. Specifically, the

Figure 5. Initial General Causal Model for the Effects of TL and Significant School Variables on *Extra Effort* (Model 3a)



The bold-faced numbers next to CTE, Context, and EE represent their squared multiple correlations or their amount of variance accounted for by the model.

Figure 6. Structural Model with Standardized Estimates for the General Causal Model 3a (Model 3b)



In the structural model above, solid single-arrow lines with coefficients represent significant arcs while dashed lines represent non-significant arcs. Rectangles indicate exogenous variables, and circles indicate endogenous variables that are measured by the model. The numbers in parentheses are the squared multiple correlations for each predicted variable.

model explained 80% of the variance in *context beliefs*, 37% of the variance in *collective teacher efficacy*, and 76% of the variance in perceived school-wide teacher *extra effort*. Most notably, CTE had the greatest direct effects on *extra effort* ($\beta = 0.85$) and, unexpectedly, the direct effects of *context beliefs* on *extra effort* ($\beta = -0.11$, $p = 0.052$), which were approaching significance, were negative; however, the overall effects of *context beliefs* on *extra effort* were positive through the effects *context beliefs* on CTE.

Hypothesis 3. The perceived transformational leadership behaviors and the exogenous school characteristics account for a significant amount of variance in self-reported teacher agency beliefs and perceived teacher school-wide extra effort.

In addition to explaining a significant amount of variance in all three predicted variables, Model 3 also supported mediation hypotheses 3a and 3b:

Hypothesis 3a. The two variables associated with teacher agency beliefs mediate the effects of transformational leadership on perceived school-wide teacher *extra effort*.

Hypothesis 3b. Teacher *context beliefs* mediate the effects of TL on *collective teacher efficacy*.

In support of hypothesis 3a, most of TL's total effects on *extra effort* were mediated by the two variables related to teacher agency. Although TL did have a significant and direct positive effect on *extra effort* ($\beta = 0.15$, $B = 0.07$, $S.E. = 0.02$, $p < 0.001$), most of TL's effects on *extra effort* were indirect (0.48). Thus, over 75% of TL's effects on *extra effort* were mediated by the path through *collective teacher efficacy beliefs* (0.37) and the path through both *context beliefs* and *collective teacher efficacy beliefs* (0.11). Table 4.11 reports the direct, indirect, and total effects of the variables in the model.

The Preacher and Hayes' (2008) test for multiple mediation confirmed that each of the paths for indirect effects was significant at the $p < 0.05$ level. The positive indirect effects of TL on *extra effort* were partially mediated by CTE ($z = 28.48$, $p < 0.001$) and by its effects on *context beliefs*, whose positive indirect effects on *extra effort* were partially mediated by CTE ($z = 27.40$, $p < 0.001$). TL also had significant and negative indirect effects on *extra effort*, mediated by *context beliefs* ($z = -6.90$, $p < 0.001$). Overall, for every 1-*SD* increase in TL, *extra effort* went up by 0.63 *SD*. Hypothesis 3b was also partially supported because although 77% of TL's effects on *collective teacher efficacy beliefs* were direct ($\beta = 0.44$, $B = 0.07$, $S.E. = 0.04$, $p < 0.001$), *context beliefs* did mediate some of TL's effects on *collective teacher efficacy beliefs* ($\beta = 0.13$). Every 1-*SD* increase in TL accompanied a 0.57-*SD* increase in CTE. Finally, hypothesis 3c, below, was fully supported because TL behaviors did have substantially greater significant and direct effects on *context beliefs* ($\beta = 0.89$, $B = 0.56$, $S.E. = 0.02$, $p < 0.001$) than they did on *collective teacher efficacy beliefs* ($\beta = 0.44$, $B = 0.24$, $S.E. = 0.04$, $p < 0.001$).

Hypothesis 3c. TL behaviors have greater direct effects on *context beliefs* than they do on CTE.

Table 4.11 Results from SEM on the Initial General Causal Model 3

β							B						
	TL	PM	Lower SES	% Minority	Context Beliefs	CTE	TL	PM	Lower SES	% Minority	Context Beliefs	CTE	R^2
Direct													
Context Beliefs	0.87	0.06	-0.09	0.02*			0.56	0.09	0.00	0.00*			
CTE	0.43	0.12	0.03*	-0.06*	0.15		0.24	0.17	0.00*	0.00*	0.13		
EE	0.15	-0.08	-0.02*	-0.02*	-0.11*	0.85	0.07	-0.09	0.00*	0.00*	-0.07*	0.67	
Indirect													
CTE	0.13	0.01*	-0.01*	0.00*									
EE	0.48	0.11	0.02*	-0.05*	0.13								
Total													
Context Beliefs	0.88	0.06	-0.09	0.02*									0.80
CTE	0.56	0.13	0.01*	-0.05*	0.15								0.37
EE	0.63	0.03	0.00*	-0.07*	0.02*								0.76

* These pathways are statistically non-significant at the $p < 0.05$ level.

Unlike the findings used to test hypotheses related to the major study variables, the statistical results provided mixed results for the hypotheses related to school characteristics. While the hypotheses related to the negative effects of *lower SES* and the *percentage of minority students* were largely unsupported, the hypothesis related to the effects of *past mastery* was largely supported:

Hypothesis 3e. A school's *lower SES* and its *percentage of minority students* have significant, negative effects on teacher agency beliefs and teacher *extra effort*.

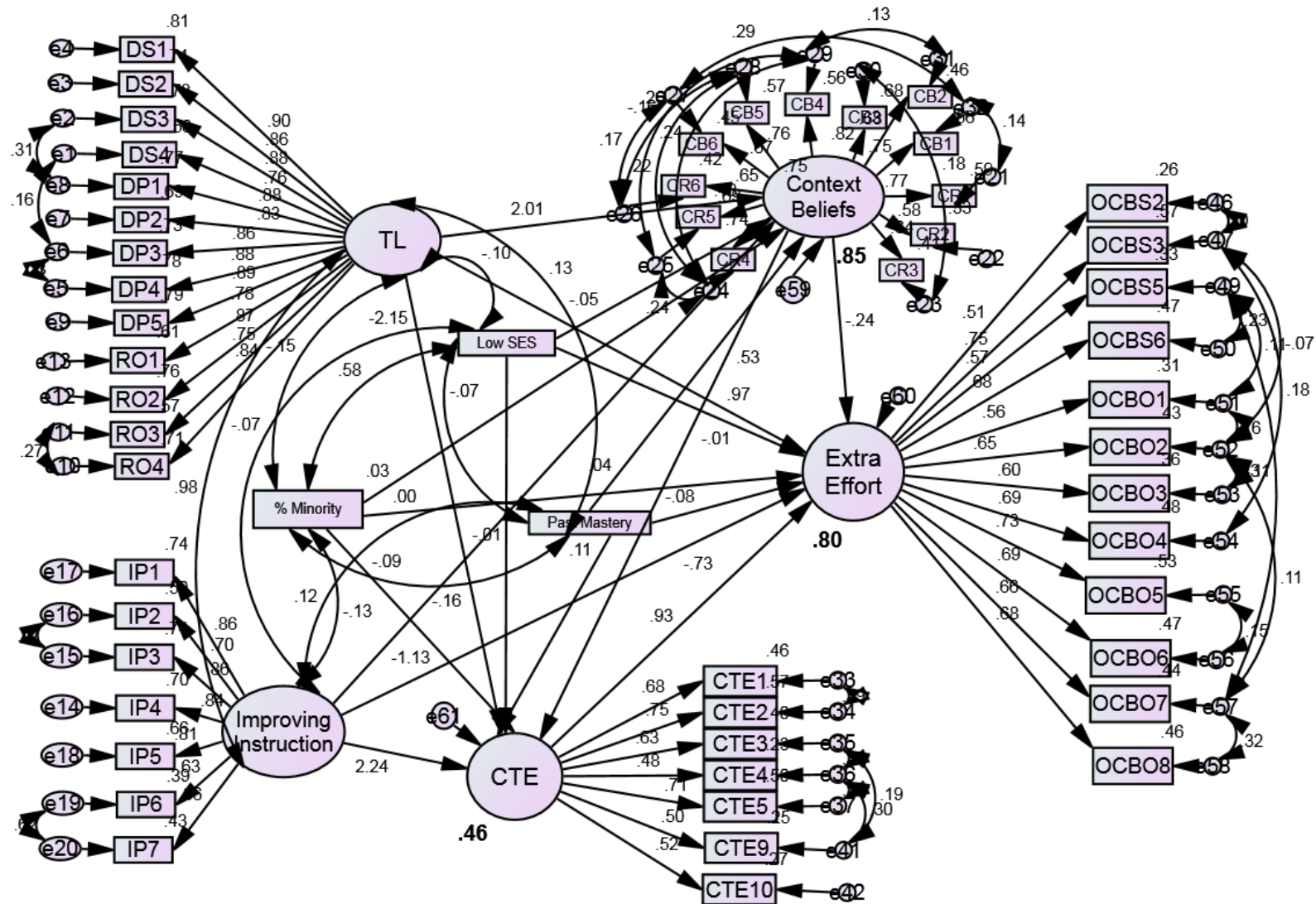
Hypothesis 3f. *Past mastery* experiences on high-stakes tests have significant, positive effects on teacher agency beliefs and teacher *extra effort*.

In regards to Hypothesis 3e, all of the effects of the *percentage of minority students* and most of the effects of *lower SES* were non-significant at the 0.05 level. *Lower SES* did, however, have a significant and direct negative effect on *context beliefs* ($\beta = -0.09$, $B = -0.004$, $S.E. = 0.001$, $p < 0.001$). On the other hand, all of the direct effects of *past mastery* in the model were significant. *Past mastery* on high-stakes tests had significant direct and positive effects on *context beliefs* ($\beta = 0.06$, $B = 0.09$, $S.E. = 0.02$, $p < 0.001$) and *collective teacher efficacy* ($\beta = 0.13$, $B = 0.17$, $S.E. = 0.04$, $p < 0.001$). Unexpectedly, *past mastery* on high-stakes tests had significant negative effects on teacher *extra effort* ($\beta = -0.08$, $B = -0.09$, $S.E. = 0.02$, $p < 0.001$). That is, success on previous high stakes tests predicted less teacher *extra effort* even though such success predicted

increased CTE. Analogous to Gibson and Dembo's (1984) finding about high-efficacy teachers' use of class time for instruction mentioned above, this finding might suggest that successful teachers either make more efficient use of class time or believe they make efficient use of class time so that they are less likely to engage in student instruction on their own time. However, the overall effect of *past mastery* on *extra effort* was positive because of its indirect effect (0.11) on *extra effort*, working through *context beliefs* and CTE. Thus, Hypothesis 3f was fully supported as *past mastery* had significant and positive *total* effects on both teacher agency beliefs and teacher *extra effort*.

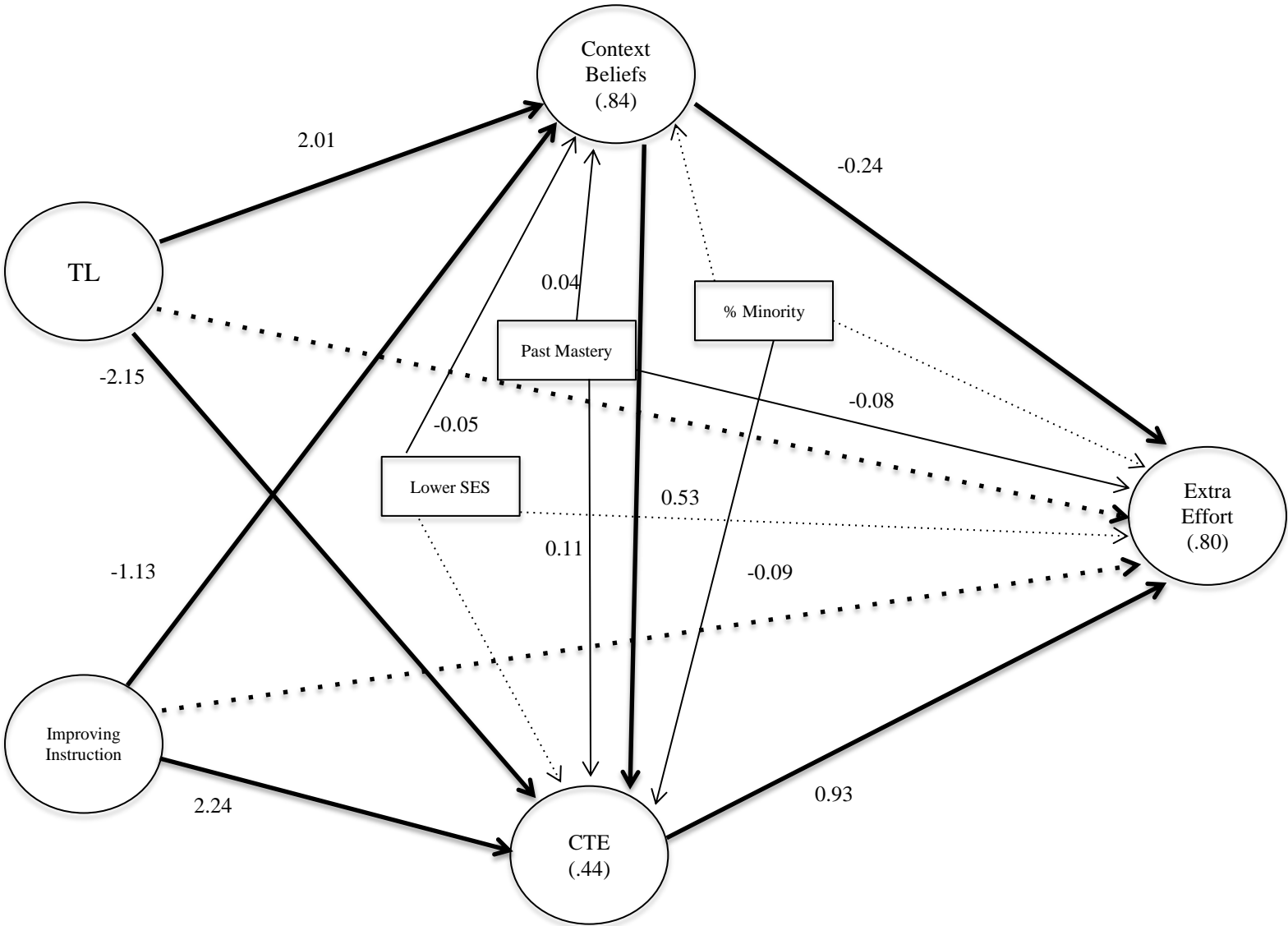
Figure 7 depicts the second general causal model (Model 4a), which includes all of the variables in Model 3, except that TL behaviors have been separated into two groups. The more traditional TL behaviors, associated with *setting direction*, *developing people*, and *redesigning the organization*, are captured as TL behaviors in the model while the recently added behaviors associated with *improving instruction* appear as a separate latent variable. AMOS 21 was used to perform the analysis based on data from 1403 teachers. For the sake of clarity, Figure 8 presents the structural model (Model 4b) without its accompanying measurement model. As predicted by Hypothesis 3, the leadership behaviors and school characteristics once again accounted for a significant amount of variance in self-reported teacher agency beliefs and perceived school-wide teacher *extra effort* in the initial general causal model. Specifically, the model explains 85% of the variance in *context beliefs*, 46% of the variance in *collective teacher efficacy*, and 80% of the variance in perceived school-wide teacher *extra effort*. Compared to Model 3, Model 4 accounts for about 5% more of the variance in each of the predicted variables, which suggests a better fit (Blunch, 2008).

Figure 7. General Causal Model for the Effects of TL and *Improving Instruction* Behaviors on *Extra Effort* (Model 4a)



The bold-faced numbers next to CTE, Context, and EE represent their squared multiple correlations or their amount of variance accounted for by the model.

Figure 8. Structural Model with Standardized Estimates for the General Causal Model 4a (Model 4b)



Model 4 also more fully supported the mediation hypotheses 3a and 3b. In support of Hypothesis 3a, all of the effects of leadership behaviors on *extra effort* were mediated by the two variables related to teacher agency. The direct effects of TL ($\beta = 0.97$, $B = 0.44$, $S.E. = 0.25$, $p = 0.08$) and *improving instruction* ($\beta = -0.70$, $S.E. = 0.23$, $p = 0.13$) on *extra effort* were statistically non-significant. Thus, the direct effect of the composite TL on *extra effort* found in Model 3 lost statistical significance by separating the two types of leadership behaviors in Model 4. Moreover, TL and *improving instruction* behaviors had quite varying indirect effects on *extra effort* through their contrasting effects on the intervening teacher agency beliefs. TL retained its significant and positive direct effect on *context beliefs* ($\beta = 2.01$, $B = 1.20$, $S.E. = 0.18$, $p < 0.001$), which is more than twice the size of that in Model 3. However, the significant and negative direct effect of *improving instruction* on *context beliefs* ($\beta = -1.13$, $B = 0.77$, $S.E. = 0.21$, $p < 0.001$) compensated for TL's greater positive effect on *context beliefs*. A similar pattern of inverse effects applied to CTE. This time TL's significant and negative direct effect on CTE ($\beta = -2.15$, $B = -1.12$, $S.E. = 0.41$, $p = 0.007$) was balanced by *improving instruction*'s significant and positive direct effect on CTE ($\beta = 2.24$, $B = 1.33$, $S.E. = 0.39$, $p < 0.001$). Finally, compared to Model 3, the significant and positive direct effect of *context beliefs* on CTE more than tripled ($\beta = 0.54$, $B = 0.47$, $S.E. = 0.15$, $p = 0.001$) in Model 4. Thus, Hypothesis 3b is supported because some of the effects (1.08) of TL on CTE are mediated by TL's effects on *context beliefs*. In fact, while all of TL's direct effects on CTE are negative, its indirect effects on CTE are positive. Table 4.12 provides a summary of the direct, indirect, and total effects for Model 4.

Table 4.12 Results from SEM on Model 4

β								B							
	TL	Improving Instruction	PM	Lower SES	% Minority	Context Beliefs	CTE	TL	Improving Instruction	PM	Lower SES	% Minority	Context Beliefs	CTE	R^2
Direct															
Context Beliefs	2.01	-1.13	0.04	-0.05	0.03*		--	1.20	-0.77	0.06	-0.00	0.00*		--	
CTE	-2.15	2.24	0.11	-0.01*	-0.09	0.54		-1.12	1.33	0.15	0.00*	-0.01	0.47		
EE	0.97*	-0.73*	-0.08	-0.01*	-0.00*	-0.24	0.93	0.44*	-0.38*	-0.09	0.00*	0.00*	-0.18	0.81	
Indirect															
CTE	1.09	-0.61	0.02	-0.03	0.01*										
EE	-1.48	1.79	0.11	-0.02*	-0.08	0.50									
Total															
Context Beliefs	2.01	-1.13	0.04	-0.05	0.03*										0.85
CTE	-1.06	1.63	0.13	0.04	-0.07	0.54									0.46
EE	-1.48	1.79	0.04	0.03*	-0.08	0.25	0.93								0.80

* These pathways are statistically non-significant at the $p < 0.05$ level.

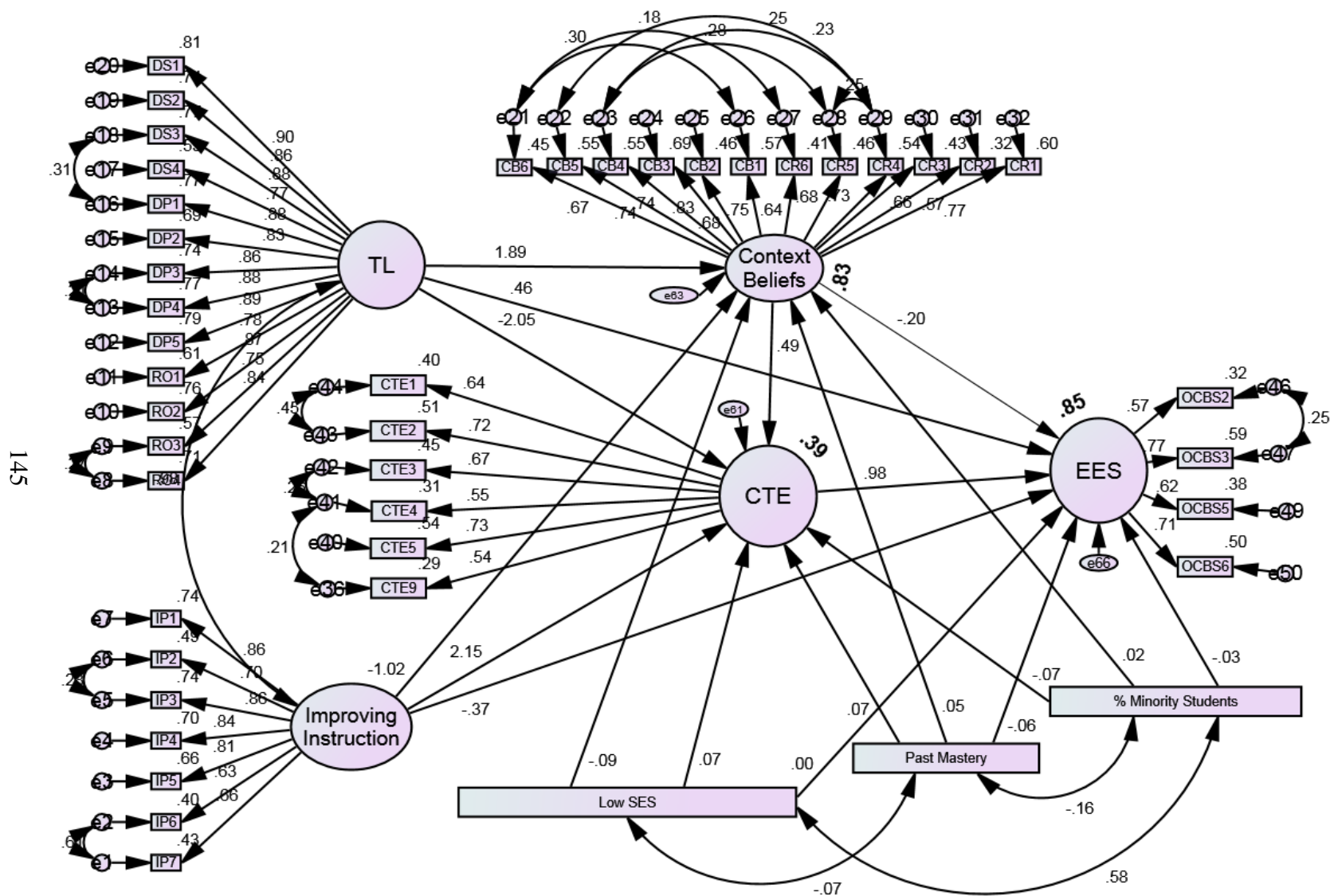
Model 4 provides mixed results for the comparative hypotheses 3c and 3d. While Hypothesis 3c is not supported because the effect of TL on *context beliefs* (2.01) is slightly less than it is on CTE (-2.15), TL clearly has a larger direct positive effect on *context beliefs* than it does on CTE. On the other hand, Model 4 fully supports Hypothesis 3d regarding the strength of behaviors related to *improving instruction*. While the size of direct effects of *improving instruction* on CTE (2.24) are only slightly larger than those of TL on CTE (-2.15), the total effects of *improving instruction* on CTE (1.63) are one and half times those of TL (-1.08). The fact that the effects of behaviors related to *improving instruction* on CTE are positive is also considerably important. Finally, the magnitude of the total effects of behaviors related to *improving instruction* on *extra effort* (1.79) were more than twice the magnitude of those related to TL behaviors (-0.73).

Similar to the case with Model 3, the hypotheses related to school characteristics were only partially supported with Model 4. In regards to Hypothesis 3e, most of the effects of the *percentage of minority students* and of *lower SES* were non-significant at the 0.05 level. In contrast to Model 3, however, the direct effects of the *percentage of minority students* on CTE were significant and negative ($\beta = -0.09$, $B = -0.01$, $S.E. = 0.002$, $p = 0.03$) in Model 4. All other effects of the *percentage of minority students* were non-significant like those found in Model 3. Also similar to Model 3, the negative, direct effect of *lower SES* on *context beliefs* was approaching significance ($\beta = -0.05$, $B = -0.002$, $S.E. = 0.001$, $p = 0.05$) while all other effects of *lower SES* were statistically non-significant. Finally, the direct effects of *past mastery* in Model 4 followed the same pattern as those in Model 3. *Past mastery* on high-stakes tests had significant direct and positive effects on *context beliefs* ($\beta = 0.04$, $B = 0.06$, $S.E. = 0.03$, $p < 0.05$) and *collective*

teacher efficacy ($\beta = 0.11$, $B = 0.15$, $S.E. = 0.05$, $p < 0.001$) and significant negative effects on teacher *extra effort* ($\beta = -0.08$, $B = 0.09$, $S.E. = 0.03$, $p < 0.001$) although once again the total effect of *past mastery* on *extra effort* was positive because of its indirect effect (0.10) on *extra effort*, working through *context beliefs* and CTE. Thus, Hypothesis 3f was partially supported as *past mastery* had significant and positive *total* effects on *context beliefs*, CTE, and teacher *extra effort*.

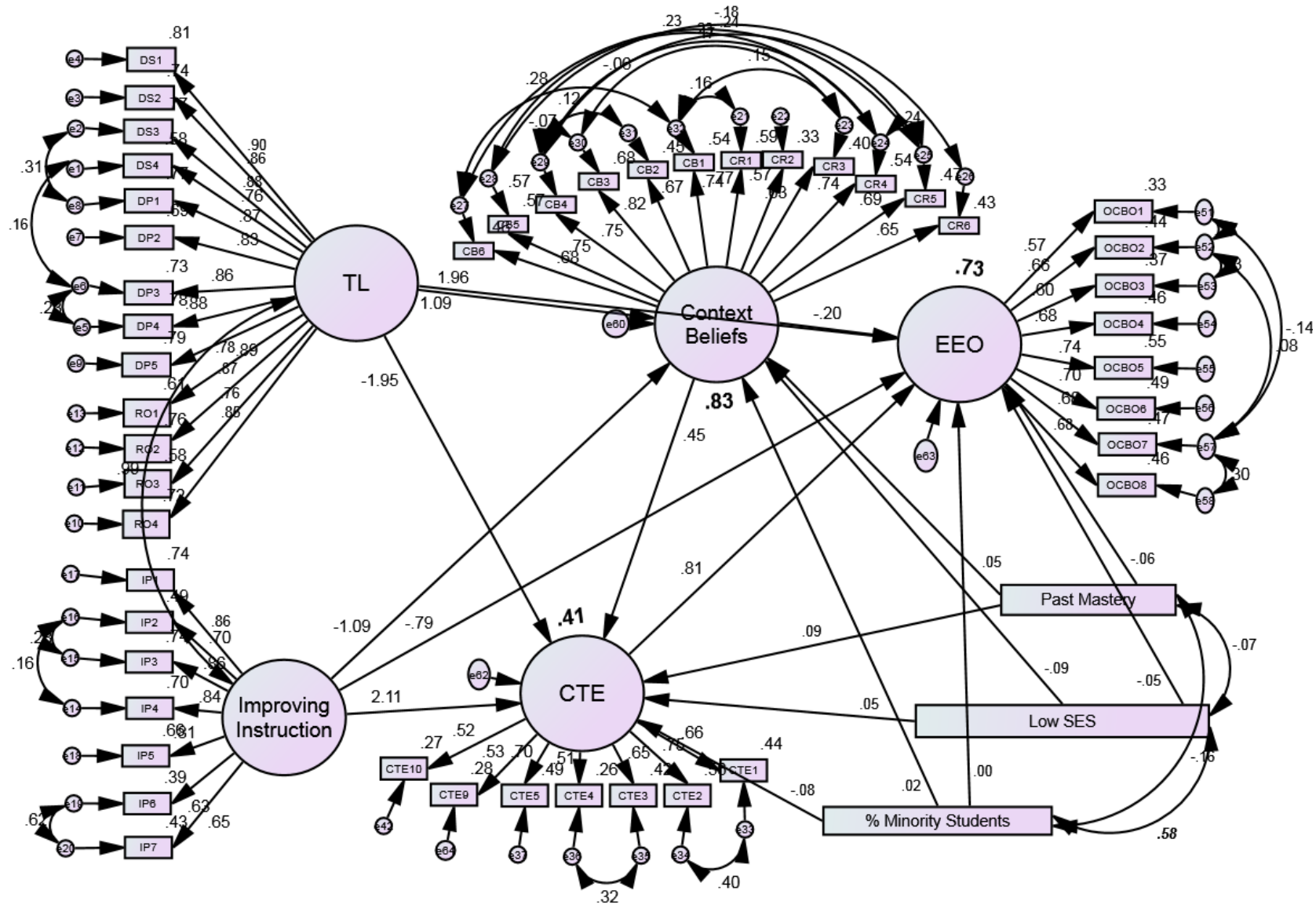
The final two models used measurement Model 2 to compare the effects of TL and *improving instruction* behaviors on teacher agency beliefs and two separate types of teacher extra effort. Model 5, depicted by Figure 9, examined the effects on *extra effort towards students* (EES) while Model 6, depicted by Figure 10, examined the effects of *extra effort towards the organization* (EEO). Model 5 explained 85% of the variance in EES, and Model 6 explained 73% of the variance in EEO. Table 4.13 reports the direct and indirect effects of each variable on the two intervening teacher agency variables and on the criterion variable for each model. While the vast majority of the relationships between these two models and Model 4 are quite similar, two notable differences arise. First, of all four models, CTE has the greatest effect on *extra effort towards students* ($\beta = 0.99$, $S.E. = 0.07$, $p < 0.001$) in Model 5, especially compared to its effect on *extra effort towards the organization* ($\beta = 0.81$, $S.E. = 0.06$, $p < 0.001$) in Model 6. Second, while behaviors related to *improving instruction* play a very similar role in all three of its models, the remaining three TL behaviors have non-significant direct effects on *extra effort*, except on *extra effort towards the organization* in Model 6 ($\beta = 1.09$, $S.E. = 0.26$, $p < 0.047$).

Figure 9. General Causal Model for the Effects of TL and *Improving Instruction* on *Extra Effort towards Students* (EES) (Model 5)



The bold-faced numbers next to CTE, Context, and EE represent their squared multiple correlations or their amount of variance accounted for by the model.

Figure 10. General Causal Model for the Effects of TL and *Improving Instruction* on *Extra Effort towards the Organization* (EEO) (Model 6)



The bold-faced numbers next to CTE, Context, and EE represent their squared multiple correlations or their amount of variance accounted for by the model.

Table 4.13 Comparisons of Standardized Direct and Indirect Effects on Criterion Variables for Each Hypothesized Model¹

	<u>TL</u>		<u>Instructional</u>		<u>Context</u>		<u>CTE</u>		<u>Past Mastery</u>		<u>% Minority</u>		<u>Lower SES</u>	
	Direct	Indirect	Direct	Indirect	Direct	Indirect	Direct	Indirect	Direct	Indirect	Direct	Indirect	Direct	Indirect
Model 3														
Context (.79)	0.87	0.00	-. ²	-.	--	-.	-.	-.	0.06	0.00*	0.02*	0.00*	-0.10	0.00*
CTE (.35)	0.43	0.13	-.	-.	0.15	-.	-.	-.	0.13	0.01*	-0.06*	0.00*	0.03*	-0.01*
EE (.76)	0.15	0.39	-.	-.	-0.11**	0.13	0.85	-.	-0.08	0.11	-0.02*	-0.05*	-0.02*	0.02*
Model 4														
Context (.84)	1.97	-.	-1.09	-.	-.	-.	-.	-.	0.06	0.00	0.02	0.00	-0.09	0.00
CTE (.44)	-2.05	1.01	2.17	-0.56	0.52	-.	-.	-.	0.09	0.03	-0.08	0.01	0.05	-0.05
EE (.80)	0.92*	-1.41	-0.70*	1.73	-0.23	0.47	0.92	-.	-0.07	0.10	-0.01	-0.07	-0.03	0.03
Model 5														
Context (.83)	1.89	-.	-1.02	-.	-.	-.	-.	-.	0.06	0.00	0.02*	0.00	-0.09	0.00
CTE (.39)	-2.05	0.93	2.15	-0.50	0.49	-.	-.	-.	0.08	0.03	-0.07	0.01	0.07	-0.04
EES (.85)	0.46*	-1.49	-0.37*	1.83	-0.20*	0.49	0.99	-.	-0.06	0.09	-0.03	-0.06	0.00	0.05
Model 6														
Context (.83)	1.97	-.	-1.09	-.	-.	-.	-.	-.	0.05	0.00	0.02*	0.00	-0.09	0.00
CTE (.41)	-1.95	0.89	2.11	-0.49	0.45	-.	-.	-.	0.09	0.02	-0.08	0.01	0.05*	-0.04
EEO (.73)	1.09	-1.24	-0.79*	1.52	-0.20*	0.37	0.81	-.	-0.06	0.09	0.00*	-0.06	-0.05*	0.02

¹ Each of the values in parentheses reflects the squared multiple correlation or coefficient of determination for the endogenous corresponding variable.

² “-.” indicates that no arc or path was specified in the model for this relationship.

* These arcs and paths are non-significant at the $p < 0.05$ level. **This coefficient is approaching significance at $p = 0.052$.

Each of the models predicted a similar level of variance in teacher extra effort ($.73 \leq R^2 \leq .85$) and highlighted the mediating roles of teacher agency beliefs. *Context beliefs* mediated all of the positive effects of TL on CTE, and CTE mediated all of the effects of TL, *improving instruction*, and *context beliefs* on teacher extra effort, except in the one case where TL had direct effects on *extra effort* towards the school. Despite the clear similarities of outcomes, separating TSL behaviors into more traditional transformational leadership behaviors (i.e., *direction setting*, *developing people*, and *redesigning the organization*) and behaviors related to *improving instruction* revealed a dichotomy that appeared in the earlier examinations of item responses. While teachers recognized their principals' supportive nature, they tended to consider the support to be somewhat general and passive, lacking the active, hands-on guidance that the *improving instruction* behaviors reflect. Conversely, those same monitoring and control behaviors associated with *improving instruction* behaviors had negative effects on teachers' *context beliefs*. At bottom, the more generalized TL support appears to promote individual autonomy associated with flexible rules and supportive bureaucratic structures, but more hands-on monitoring behaviors appear to foster confidence in the capabilities of others. Robinson et al. (2008) noted that one reason effect sizes associated with TL tend to be considerably lower than those associated with instructional leadership is that the goals associated with TL tend to be more general and social in nature while goals related to instructional leadership tend to be more specific and measurable.

Facing challenges of multicollinearity. Even though the last three models (Models 4, 5, and 6) exhibited adequate goodness-of-fit indices, numerous indicators suggest that multicollinearity of the leadership dimensions might actually undermine these solutions, making

their results difficult, if not misleading, to interpret. First, the magnitude and signs of the effects of the leadership dimensions on *context beliefs* and CTE in Models 4, 5, and 6 are inconsistent with theoretical expectations. The two leadership dimensions have inordinately large standardized coefficients and negative effects even though these correlations were positive and strong in the corresponding measurement model. As mentioned earlier, the high internal consistency of the TSL scale ($\alpha = 0.98$) most likely reflects redundancy of the factors and their items (Streiner, 2003). Similarly, the very high positive correlation ($r = 0.98$) between the latent TL and *improving instruction* constructs in all three of the models with these two separate types of leadership behaviors points to a significant problem with multicollinearity in these models (Marsh, Dowson, Pietsch, & Walker, 2004). Additionally, all of the standard error estimates for paths emanating from the two latent leadership constructs are quite large. In fact, the standard errors for Model 4, which range from 0.18 to 0.41, are an order of magnitude higher than those for the single latent TL construct in Model 3. Such high standard errors make the point estimates for the model very misleading. For instance, in Model 4, the 95% confidence intervals for the point estimates for the effects of the leadership variables on CTE range ± 0.78 . Thus, the 95% confidence limits for the direct effects of TL on CTE range from a lower limit of -1.90 to an upper limit of -0.34, which includes non-significant values. Finally, several other models that included the other leadership dimensions as separate variables resulted in impermissible solutions, including negative error variance and covariance matrices that were not positive definite. According to Blunch (2008), negative variances arise when the correlations among indicators for the same latent variable are not sufficiently different. Similarly, covariance matrices that are not positive definite indicate that at least one variable is a linear function of

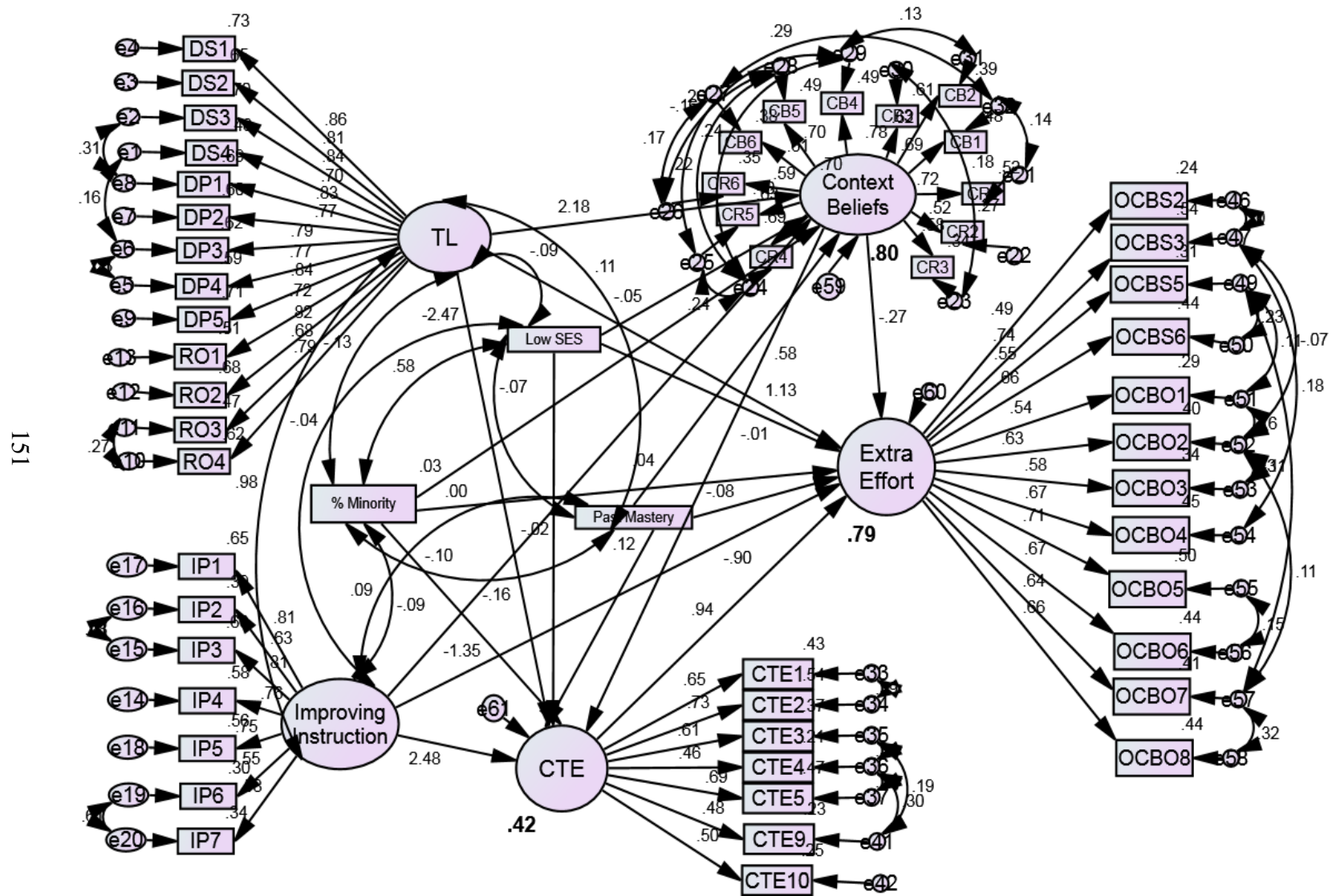
another variable in the model (Blunch, 2008). Grewal, Cote, and Baumgartner (2004) found that high levels of multicollinearity tend to cause improper solutions in SEM.

The method described by Marsh et al. (2004) was used to further test whether Model 4 exhibited multicollinearity. With the variances of the TL and *improving instruction* factors scaled to 1, Model 7, depicted in Figure 11, was created as an alternative to Model 4. With the effects of the two variables standardized in relation to a common metric, Model 7 should have provided a significantly worse solution if the arcs emanating from TL and *improving instruction* really do differ significantly. Thus, if the fit of Model 7 approaches the fit of Model 4, TL and *improving instruction* play very similar predictive roles. The model fit comparisons in Table 4.14 along with the very similar estimates in Model 7 suggest that Model 4 is negligibly better than Model 7. Although many of the estimates in Model 7 are quite similar to those in Model 4, the standard errors for the paths emanating from the two leadership variables in Model 7 nearly doubled. All of these signals combined suggest that the solutions provided by Models 4, 5, and 6 should be interpreted with great caution and wide latitude.

Table 4.14 Comparison of Models for Multicollinearity Test

Model	CMIN (df)	<i>P</i>	CMIN/df	CFI	NFI	TLI	PCFI	RMSEA	PCLOSE
4	10074.97 (1320)	0.00	3.37	0.944	0.922	0.939	0.87	0.041	1.00
7	9868.70 (1322)	0.00	3.57	0.939	0.918	0.934	0.86	0.043	1.00

Figure 11. Alternative Model to Test Multicollinearity of Leadership Behaviors (Model 7)



This general causal model is identical to Model 4, except that the variances for the two leadership variables (i.e., TL and *improving instruction*) have been set to 1.

These concerns about the multicollinearity of the various dimensions of transformational leadership undermine the interpretative value of all of the models (Models 4, 5, & 6) based on measurement Model 2. Therefore, all of the hypotheses comparing the effects of the traditional TL behaviors (i.e., behaviors related to *direction setting*, *developing people*, and *redesigning the organization*) to the effects of *improving instruction* behaviors remain inconclusive. Nevertheless, Model 3 offers sufficient statistical evidence to attest to the significance of the combined transformational leadership behaviors and teacher agency beliefs in explaining a substantial amount of variance in individual teacher's perceptions of school-wide *extra effort*. Moreover, Model 3 highlights the centrality of teacher agency beliefs, most notably CTE, as mediators in the relationship between leadership behaviors and teacher *extra effort*.

CHAPTER 5

DISCUSSION

Although transformational leadership has been examined quite extensively in non-school settings over the past four decades, transformational leadership in schools has received far less scrutiny despite growing confidence in its ability to foster follower commitment and capacity. Even with a growing number of school-based studies over the past two decades, much more needs to be known about how principal behaviors indirectly affect school outcomes, especially during high stakes accountability movements in high schools in the U.S. To those ends, this study helps illuminate how principals indirectly affect teacher behavior through their direct effects on teacher agency beliefs, most notably collective teacher efficacy beliefs. As one of the few large-scale quantitative studies of transformational leadership conducted in the United States, this study confirms the significant role of transformational leadership in high schools experiencing high-stakes accountability measures associated with NCLB.

This study specifically confirms previous studies' findings regarding the positive associations between transformational leadership behaviors, teacher efficacy beliefs, and teacher extra effort. All of the major study variables exhibited moderate to strong positive correlations, while only collective teacher efficacy beliefs exhibited consistently strong positive correlations with both types of extra effort, directed towards students and the school. By focusing on the importance of teachers' context beliefs and collective efficacy

beliefs, this study also corroborates social cognitive theory's centrality of agency beliefs as the psychological mechanisms mediating leadership and goal-oriented extra effort.

Perhaps the most apparently interesting finding in this study relates to the differential effects of the leadership dimensions: the traditional behaviors related to TL (i.e., *direction setting, developing people, and redesigning the organization*) and those more traditionally related to instructional leadership (i.e., *improving instruction*) contained in the model of Total School Leadership. These findings suggest that directive leadership behaviors related to monitoring, evaluating, and controlling instructional practices in the pursuit of predetermined ends can conflict with the broader role of participatory leadership behaviors that inspire, develop, and recruit teachers to collaborate and participate in decision-making processes that help define collective goals. Nevertheless, this study's findings also warn against all such studies that claim to uncover particular relationships between leadership dimensions and school outcomes because numerous indicators suggest that these behaviors are often collinear and therefore resist individuation.

Transformational Leadership and Teacher Extra Effort

This study verifies the significant effects of transformational leadership in the development of capacity and commitment in high school teachers in the United States. Transformational leadership behaviors accounted for a significant amount of variance in both types of teacher agency beliefs (i.e., context beliefs and collective teacher efficacy beliefs) and teacher extra effort. While earlier studies also found that TL behaviors were associated with collective teacher efficacy beliefs (Demir, 2008; Leithwood et al., 2010; Ross & Gray, 2006a, 2006b) and more favorable beliefs about flexible and supportive

work settings (Korkmaz, 2007; Vecchio et al., 2008), this is the first study in the United States to demonstrate that TL behaviors explain a significant amount of differences in teachers' perceptions of school-wide extra effort in high schools facing reform associated with NCLB.

The Centrality of Teacher Agency Beliefs

This study also supports that claim, posited by social cognitive theory, that teacher agency beliefs related to context and efficacy serve as fundamental psychological mechanisms between external influences, such as leadership behaviors, and goal-oriented behavior (Bandura, 1997). Context beliefs and collective teacher efficacy beliefs mediated a vast majority of the effects of transformational leadership behaviors on teacher extra effort. While TL did directly affect teacher extra effort, over 75% of TL's effects on teacher extra effort were mediated by teacher agency beliefs. Moreover, as the mediator of the effects of the leadership behaviors and context beliefs on teacher extra effort, collective teacher efficacy beliefs served a central role in the relationship between perceived leadership behaviors and perceived teacher behavior. Bogler and Somech (2004) also found that collective teacher efficacy beliefs played a central role in explaining extra effort.

Although TL's direct effects on teacher context beliefs were twice as large as TL's direct effects on collective teacher efficacy beliefs, collective teacher efficacy beliefs facilitated most of TL's effects on teacher extra effort. In fact, over 77% of TL's indirect effects on teacher extra effort were mediated directly through collective teacher efficacy beliefs because context beliefs did not significantly directly affect teacher extra effort. In fact, the direct effects of context beliefs on teacher extra were negative, yet not

quite significant. Moreover, all of the positive effects of teacher context beliefs on teacher extra effort were also mediated by collective teacher efficacy beliefs. Thus, this study corroborates other studies' findings regarding the primacy of collective teacher efficacy beliefs in effective schools (Goddard, 2001; Goddard et al., 2004; Moolenaar et al., 2012). Several studies have also reported that TL had greater effects on context beliefs than on efficacy beliefs (Giejsel et al., 2003; Leithwood & Jantzi, 2006; Yu et al., 2002) and that context beliefs mediated at least some of the effects of leadership on CTE (Giejsel et al., 2003).

The finding that context beliefs had a negative direct effect on teacher extra effort was unexpected. Overall, teachers who reported more favorable context beliefs in terms of enabling school structures were more likely to report less school-wide extra effort from their colleagues. It might be that a more lax context failed to establish or uphold norms related to extra-effort behaviors. By endorsing flexible rules and less hierarchical decision-making processes, these contexts appear to support greater autonomy and self-directed behaviors, which may promote greater self-efficacy beliefs (Eyal & Roth, 2011). Lower levels of extra effort have been reported in high-efficacy teachers (Gibson & Dembo, 1984). On the other hand, teachers who reported that their schools exhibited more enabling school structures may have been in schools with greater levels of success on previous high-stakes tests, where such success resulted in a more lax environment. Studies have shown that previous success can result in lower levels of performance, as individuals maintain behaviors that have worked in the past or become complacent (Vancouver & Kendall, 2006; Vancouver, Thompson, & Williams, 2001), and that some self-doubt can motivate higher levels of performance (Woodman, Akehurst, Hardy, &

Beattie, 2010). Both of these scenarios may help explain the small direct effect of the particular context beliefs used in this study on collective teacher efficacy beliefs. Had the context beliefs been formulated in terms of communal behaviors instead of merely in terms of freedom from interference, they most likely would have had greater effects on collective teacher efficacy. Nevertheless, while context beliefs did not have direct positive effects on teacher extra effort, they did have significant and positive indirect effects on teacher extra effort through their significant and positive direct effects on collective teacher efficacy beliefs.

In addition to the centrality of agency beliefs, the study confirmed social cognitive theory's emphasis on past mastery experiences as a significant source of efficacy beliefs. Other studies have corroborated the positive relationship between past mastery and collective efficacy beliefs (Cybulski et al., 2005; Goddard & Skrla, 2006). Although past mastery on high-stakes testing did not have nearly the effect on teacher agency beliefs that TL did, it did have significant positive effects on both context beliefs and collective teacher efficacy beliefs in all of the models tested. Cybulski et al. (2005) posited that past mastery and collective teacher efficacy beliefs have normative functions that influence teachers to participate in behaviors that are believed to improve student achievement. Accordingly, past achievement and other indicators of success serve as forms of group-level social persuasion that generate norms for future goals and associated behaviors (Goddard et al., 2000). As teachers prove to be efficacious, they engage in behaviors that sustain and improve upon their success. Conversely, teachers who have experienced repeated failure or obstacles to success lose their beliefs in their ability to succeed and therefore disengage from those same behaviors.

Unexpectedly, past mastery experiences had a significant, although small, negative direct effect on teacher extra effort. Latham and Locke (2006) give one possible explanation about how past mastery can result in lower levels of extra effort. Teachers who have experienced past mastery on high-stakes testing might experience greater satisfaction and confidence in maintaining practices that have appeared to work instead of increasing effort or taking greater risks. Studying the behaviors of teachers with high self-efficacy, Gibson and Dembo (1984) found that high-efficacy teachers made more efficient use of class time and more effective use progressive forms of discipline and were, therefore, less likely to report spending their free time on instruction. In a similar manner, success on previous high-stakes testing might make teachers overly confident that past classroom instructional techniques are sufficient to accomplish their task, or these teachers might also actually make better use of assigned instructional time by using innovative instructional techniques. Other studies have demonstrated how past success can result in complacency (Vancouver & Kendall, 2006; Vancouver, Thompson, & Williams, 2001). Overall, however, past mastery experiences had significant and positive indirect effects on teacher extra effort, working through teacher agency beliefs.

Conflicting Styles of Leadership Behaviors

The descriptive analyses of responses to survey items evinced several clear dichotomies. In the case of leadership behaviors, teachers reported higher levels of generalized direction setting and modeling behaviors along with comparatively lower levels of individualized hands-on support. They also reported fewer opportunities to participate in decision-making. The pattern of responses suggests a somewhat generalized and passive application of transformational leadership techniques with a low degree of

participatory leadership style. At the same time, the inordinately high response ratings to *improving instruction* items about the use of data in teacher work reflects a highly directive leadership style in regards to instruction. Somech's work reveals how a combination of directive leadership style that aims to monitor, evaluate, and control classroom instruction (2005a) and collaborative tasks that serve to empower the team (2005b) has a tendency to constrain individual autonomy and thus undermine individual empowerment and innovation. This combination might serve to explain the conflicting effects of TL behaviors (i.e., *direction setting*, *developing people*, and *redesigning the organization*) and *improving instruction* behaviors. The participatory, yet generalized nature of the of the TL behaviors appear to have strong positive effects on *context beliefs*, *qua* freedom from interference, that foster autonomy and self-efficacy (Pelletier, Seguin-Levesque, & Legault, 2002) while the directive nature of the *improving instruction* behaviors apparently have strong negative effects on such enabling structures.

These same leadership behaviors seem to have inverse effects on CTE. The participatory, yet generalized TL behaviors may have negative effects on CTE because they fail to generate strong social norms. It is well documented how organizational factors affect self- and collective efficacy beliefs differently, including how leadership affects individuals' motivation to contribute to a group (Chen & Bliese, 2002). On the other hand, the directive behaviors associated with *improving instruction* seem to provide group norms that instill confidence in the group. Thus, the various transformational leadership behaviors may "achieve their effects on followers by priming different aspects of [teachers'] self-concepts" (Kark et al., 2003). Much more needs to be known about

how the various leadership behaviors affect these different self-concepts through varying mechanisms.

Even leadership behaviors categorized by the same label can be worded to capture different types of behaviors. The history of instructional leadership research reveals that such leadership techniques can be formulated as broader management goals or as controlling directives (Lee et al, 2012). Other studies have shown how the same types of transformational leadership behaviors can be either generalized or specific. For instance, *individualized consideration* can be operationalized as both supporting and developing behaviors (Yukl, 2006). Nguni et al. (2006) conceptualized *individualized consideration* as supporting roles such as respect and appreciation. They suggested that operationalizing this dimension as developing roles such as coaching and mentoring might yield more significant results for these types of behaviors. Similarly, Geijsel et al. (2003) argued that *individualized consideration as support* has stronger effects on the follower's satisfaction with leader but weaker effects on motivation. Thus, if the models indicating inverse effects of the two leadership dimensions are accurate, the generalized, yet supportive TL behaviors associated with the *direction setting*, *developing people*, and *reorganizing the organization* dimensions appear to be conflicting with the directive items associated with the *improving instruction* dimension.

Given the extremely high correlations, however, between the traditional transformational leadership dimensions and the newly added *improving instruction* behaviors, these different dimensions appear to be articulating the same behaviors. In their meta-analysis of the total effects of leadership on student achievement, Robinson et al. (2008) found that the mean effect size for instructional leadership was three to four

times larger than that of transformational leadership. They pointed out, however, that transformational leadership studies tend to focus on social outcomes such as relationships and psychological states while instructional leadership studies focus on academic outcomes. Instructional leadership items tend to be more specific and related to very specific achievement goals while TL items are comparatively vague and related to social relations. The TSL scale, on the other hand, appears to articulate instructional leadership behaviors in transformational language, making it difficult to distinguish the two types of behaviors.

Multicollinearity of the Leadership Dimensions

Both theory and empirical findings suggest that this study's models that included separate transformational leadership behaviors suffered from multicollinearity. Thus, it is very difficult to interpret Models 4, 5, and 6 without a degree of flexibility and even skepticism. This finding serves as a caveat to other studies that analyze separate leadership dimensions without testing for the presence of multicollinearity. Based on this study's analysis, the dimensions of the school-based transformational leadership construct appear to be highly correlated, reflecting item redundancy or the presence of an underlying common factor. Several studies (e.g., Leithwood & Jantzi, 2006; Yu et al., 2002) briefly mentioned the possibility of multicollinearity without actually testing for it, and a few even found unexpected negative effects of TL behaviors (Leithwood & Jantzi, 2006; Thoonen et al., 2011). According to Grewal et al. (2004), researchers tend to dismiss multicollinearity because they believe SEM is largely immune to its effects. Even though over 75% of the articles they reviewed in three marketing journals revealed potential problems with multicollinearity and nearly 30% of those studies exhibited very

strong correlations among constructs, none of the articles analyzed the effects of multicollinearity (Grewal et al., 2004).

Limitations

Because the data in this cross-sectional study were collected at one point in time, results cannot reveal causal relations between variables. Teachers who reported higher levels of school-wide extra effort might be more inclined to evaluate their principals and their colleagues more favorably. In fact, social cognitive theory accounts for the reciprocal nature of efficacy beliefs and agentive behavior: higher efficacy beliefs should lead to increased performance, and increased performance should lead to greater efficacy beliefs (Bandura, 1997). Additionally, higher levels of all of the major variables might have resulted from a third factor, such as unobserved favorable school conditions. Future research should use alternative sources of data on leadership, teacher agency beliefs, and teacher extra effort across several time periods in order to make inferences about causation.

The most significant limitation of the study arises from its primary methodology. By relying heavily on teacher self-reported observations to measure all four of the study's major variables, the study's findings could be influenced by common method variance attributed to the method of measurement rather than the instrument itself. Such "systematic measurement error is a particularly serious problem because it provides an alternative explanation for the observed relationships between measures of different constructs that is independent of the one hypothesized" (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In this case, measurement error might arise from a heavy reliance on single-source data since the measures for TSL, agency beliefs, and extra effort are all

derived from the observations by the same teachers. As a result, the empirical data from a single source can at least partially explain hypothesized relationships among variables. Factor analysis, however, suggested that common-source variance in this study was not a serious problem since principal axis analysis with varimax rotation (eigenvalue > 1) revealed the presence of seven factors. Had the common-source bias been serious, factor analysis would have revealed one single factor or one factor that explained a majority of the covariance in the study variables (Podsakoff & Organ, 1986). Nevertheless, future studies should draw upon a variety of sources for information, including field observations or multiple reporters, about leadership behaviors, agency beliefs, and extra effort.

In addition to common method/source variance, teacher response bias was hard to detect without other sources of data. Given the high-stakes accountability and role of the principal in disseminating many of the surveys, teachers could have felt pressured to respond favorably to the survey questions. Such response bias could have inflated the degree to which teachers perceived their leaders as transformational or the degree to which they reported their own collective agency beliefs and extra effort. Nevertheless, Spector (2006) contends that studies show that social desirability presents little, if any, inflationary bias associated with self-reports, especially when compared to other sources of data.

Other complications could have arisen from the nature of the sample. Although the overall sample size was sufficient to conduct the statistical tests at a sufficiently high statistical power (von Oertzen, 2010), the response rates for individual schools were low. The response rate is consistent with studies using similar recruitment methods, and good

number of teachers may not have received the survey, especially when the principal was responsible for disseminating the email invitation. Nevertheless, such a small response rate could have over-represented sub-populations, which could have disproportionately affected the sample. If the respondents' ratings did not reflect the beliefs of the actual targeted population, it is difficult to generalize the findings beyond those teachers represented in the sample. Even if the sample reflects the target population well, the results are difficult to generalize beyond urban and major suburban high schools like those in the sample of Texas high schools.

In regards to the findings related to social cognitive theory, the study did not include the teachers' emotional arousal processes or their personal goals as part of the broader concept of teacher motivation although theory and research (Bandura, 1997; Ford, 1992; Leithwood et al, 1994) suggest their importance. Understanding how teachers viewed district and state goals related to principal leadership might have shed light on the effects of such leadership. Following the advice of Somech (2005a, 2005b), this study would have gained from the inclusion of personal teacher efficacy in order to gain a more complete understanding of how leadership behaviors result in trade-offs between psychological mechanisms that have personal and communal variants. Similarly, the current study did not look beyond the effects of the principal to examine how district policies and support affect teachers' perceptions of their principals or to examine how principals' views of the district affect their leadership behaviors. Although Taggar and Seijts (2003) demonstrated that role-specific behaviors mediate the relationship between leader efficacy and collective efficacy, these leader beliefs did affect team performance through their effects on behavior and collective efficacy beliefs. Thus, principals' beliefs

about their own efficacy might prove to be significant determinants in the relationships studied here.

Finally, the model fit could have been improved by a closer examination of the scale items. Although numerous experts justify covarying error terms on the same latent variable (Blunch, 2008; Gaskin, 2010; Hooper et al., 2008; Kenny, 2011), correlating error terms masks underlying factors that can explain the covariance. Similarly, high correlations between some of the scales' dimensions suggest that the constructs failed discriminant validity. Close examination of the scale items could have detected indiscriminant items that could have been deleted in order to improve model fit. Improving the discriminant validity of the scale items and field testing additional items that strength the scales' internal reliabilities while reducing inter-dimension correlations would have allowed a closer examination of the effects of individual transformational leaders behaviors. Nevertheless, scale development was outside the scope of the present study.

Recommendations for Future Research

This study's recommendations for future research echo many of the recommendations that have been made over the past few decades, indicating that a lot of work remains to be done in order to clarify the roles and effects of school leaders. To improve the understanding of school leadership, studies need to provide more differentiated leadership behaviors to support specific leadership recommendations. Studies also need to continue to explore how multiple mediators interact with leadership and school outcomes. Finally, further examination of the effects of past mastery and distributed leadership are warranted.

This study reveals how a school-based leadership construct that consists of moderately correlated, yet distinct leadership behaviors is needed to test the relative contributions of each type behavior. Existing comprehensive constructs, such as the *TSL* construct used in the present study, tend to exhibit highly correlated behavioral dimensions that appear to suffer from multicollinearity. Therefore, it is quite difficult to examine the differing effects of these dimensions and thus make specific recommendations for policy and practice. The collinear nature of the dimensions also obscures how nuanced behaviors can work against each other. As the research on *individualized consideration* reveals, slight differences in wording and specificity can result in considerably different outcomes (Geijsel et al, 2003; Nguni et al., 2006). Nearly two decades ago, Hallinger and Heck (1996) made a similar recommendation for future studies to clarify more specifically how school leaders utilized vision, mission, and goals. Instead of delimiting these behaviors, constructs continue to blur these behaviors and studies tend to use different types of behaviors interchangeably. Future studies should pay close attention to how they word specific behaviors and should use competing or complementary leadership dimensions with moderate correlations in order to distinguish between types of behaviors and to analyze how these different behaviors interact with one another to affect inter-related or even competing school factors and outcomes.

Future studies should also include additional psychological mediators in the relationship between leadership and behavioral outcomes in schools. Research shows that the same leadership behaviors can result in contradictory outcomes based on varying psychological dispositions exhibited in followers. For instance, different types of trust (*i.e.*, affective vs. cognitive) have been shown to mediate the effects of the same

leadership behaviors on cooperation or dependence (Zhu, 2013) while different types of identification (*i.e.*, personal vs. social) have been shown to mediate the effects of the same leadership behaviors on empowerment or dependence (Kark et al., 2003). Including these other types of psychological mechanisms might uncover the inner workings of leadership and explain how similar behaviors bring about differing outcomes in groups of followers with varying experiences, talents, and skills. In order to investigate the trade-off or interaction between individual and communal types of psychological mechanisms such as efficacy and empowerment, future studies should examine both types of mechanisms in conjunction with varying leadership styles and complementary as well as conflicting organizational outcomes. These psychological dispositions can also prove to account for leadership effects when included in the model. For example, Nir and Kranot (2006) demonstrated that the effects of TL behaviors were insignificant when they included teachers' feelings of autonomy and role satisfaction. Uncovering the interactions between the essential psychological mechanisms that motivate teacher behavior is a fundamental task that researchers should continue to pursue in order to understand the true effects of school leadership on teachers. Greater understanding will require quantitative studies that draw upon very large sample sizes that use sophisticated statistical procedures as well as more focused studies that use in-depth qualitative methods to gain greater understanding of teacher beliefs and motivation.

This study would have benefited from the inclusion of beliefs about personal teaching efficacy in order to compare how the two types of efficacy affect how followers view leadership behaviors. It could very well be that the leadership behaviors in this study have inverse effects on these two types of efficacy beliefs. The monitoring and

control behaviors related to *improving instruction*, which appear to support one's confidence in the work of other teachers, might actually diminish one's sense of personal self-efficacy. The apparent inverse effects of TL and *improving instruction* also support this hypothesis. While the TL behaviors predict a less rule-driven and less authoritarian context in which autonomous, self-directed behavior might thrive, behaviors related to *improving instruction* appear to predict stronger, less flexible rules and more centralized authority. Somech's (2005b) analysis of two different types of empowerment (i.e., *personal empowerment* and *team empowerment*) supports this possibility. While personal empowerment is associated with an individual's self-actualization needs fostered by opportunities for self-directed, autonomous professional activities that highlight individual efficacy and achievement, team empowerment is associated with social-psychological needs fostered by collaboration that highlight collective efficacy towards shared goals that fulfill the school's mission. Although it might be possible to balance the two types of efficacy, individual achievement stemming from autonomous effort can conflict with group achievement based on group norms and consensus building activities. Somech (2005b) found that in different contexts the two types of empowerment either augment one another, substitute for one another, or conflict with one another. Specially, they augment each other towards greater performance, substitute for one another to promote organizational commitment, and conflict with one another in their relationships with professional commitment. As team empowerment increased, the workings of the team constrained personal empowerment. Similarly, leaders who use more directive techniques to empower the collective towards shared goals might increase in-role performance at the expense of personal empowerment, autonomy, and innovation.

In addition to these potentially competing psychological mechanisms, including other intervening variables might dramatically alter the relationship between leadership and teacher agency. Wahlstrom and Louis (2008) found that teachers were less dependent on their principals in schools with strong professional learning communities. Including a variable representing the strength of such communities within schools might diminish the total leadership effects because these types of school factors appear to serve as leadership proxies. Similarly, Nir and Kranot (2006) reported that the effects of TL became non-significant when they added autonomy and role satisfaction as mediating variables.

In regards to social cognitive theory, this study suggests that future studies should examine the potential drawbacks of past success and excessively supportive school contexts. In this study, both past mastery on high-stakes testing and positive context beliefs had small but negative direct effects on teacher extra effort. Studies should explore the conditions under which these factors foster complacency. In order to understand the effects of past mastery more fully, future studies should examine trends of past mastery experiences instead of using the most recent past mastery experience or an average of past mastery experiences as used in this study. Finnigan and Gross (2007) found that the trend of past mastery experience played an important role in determining the motivation of teachers. While protracted levels of low past mastery were associated with lower expectations and diminished motivation, recent failures or decreases in mastery experiences actually resulted in increased time spent on instruction and increased willingness to devote personal time to work with students. They concluded that initial increases in motivation and effort were difficult to sustain, giving way to diminished individual and collective morale.

Finally, studies should continue to examine distributed leadership, especially in the high school setting. Although principals can certainly play a role in all four categories of transformational leadership, other school leaders most likely have more direct, daily interactions with teachers at the high school level. Vice principals, deans, department chairs, and even mentor teachers most likely contribute to a teacher's context beliefs and collective efficacy beliefs to a considerable degree. Future quantitative studies should explore the network of leadership effects that contribute to teacher agency while qualitative studies should elucidate the meaning teachers attribute to the various types of leadership.

Despite these limitations and recommendations, the current study corroborates the important role of transformational leadership behaviors in commitment and capacity development in schools experiencing reform in the United States. These leadership behaviors were associated with and predicted a significant amount of differences in perceived teacher agency beliefs and reported school-wide extra effort. Additionally, this study corroborates the mounting evidence supporting the crucial role of collective teacher efficacy in effective schools. Because collective teacher efficacy beliefs appear to serve as vital psychological mechanisms between organizational influences like leadership and changes in teacher behavior, policy makers and school leaders should consider the central role of teacher collective efficacy beliefs in their plans for school improvement.

APPENDIX A
DEFINITIONS OF KEY CONCEPTS

Capability beliefs (a.k.a., capacity beliefs or efficacy beliefs) represent a person's expectations about that person's ability to accomplish some goal.

Context beliefs represent a person's expectations about the extent to which a person's context—school, administration, and faculty—will support that person's goal-oriented efforts.

Leadership, according to Yukl (2006), “is the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives” (p. 8).

Lower SES is a variable indicating the percentage of students on Free or Reduced Lunch in the school. Although the variable name may suggest a category instead of a continuous variable, the variable name signifies that higher values indicate lower socioeconomic status instead of higher socioeconomic status..

Organizational citizenship behaviors (OCB) are vital employee behaviors that support the organization, but are not directly required for task performance (Borman & Motowidlo, 1993; Organ, 1997; Smith, Organ, & Near, 1983). Katz and Kahn (1966) considered these “actions not specified by role prescriptions but which facilitate the accomplishment of organizational goals” so essential that the “system would break down” without them (p. 338-339). The current study generally uses *extra effort* as a broad category of discretionary behaviors including organizational citizenship behaviors.

Past mastery, according to social cognitive theory, serves as one source of an individual's efficacy beliefs. In the current study, *pasty mastery* represents student success

on high-stakes testing over the past three years. Although the rating system is directly related to student achievement and therefore should serve as a source of student capability beliefs, the rating is used to evaluate school effectiveness and, thus, associated with the teachers' success in preparing students for the tests.

Perceived Collective Teacher Efficacy (CTE) represent a teacher's perceptions that the teachers in his or her school are collectively capable of achieving some goal.

Personal agency beliefs reflect the degree to which an individual or individuals in a group consider themselves capable of achieving some goal within a given context.

Personal agency beliefs include beliefs about both capabilities and the context.

Transactional leadership motivates followers through "an exchange process that may result in compliance with leader requests but is not likely to generate enthusiasm and commitment to task objectives" (Yukl, p. 262, 2006). Followers complete task objectives in order to gain rewards or avoid punishments, not because they necessarily identify with or adopt those objectives as their own.

Transformational leadership (TL), in contrast to transactional leadership, "transforms and motivates followers by (1) making them more aware of the importance of task outcomes, (2) inducing them to transcend their own self-interest for the sake of the organization or team, and (3) activating their higher-order needs" (Yukl, p. 262, 2006). Burns (1978) defined transformational leadership as "the reciprocal process of mobilizing, by persons with certain motives and values, various economic, political, and other resources, in a context of competition and conflict, in order to realize goals independently or mutually held by both leaders and followers" (p. 425). According to Leithwood and Jantzi (2009), "all

transformational approaches to leadership emphasize emotions and values, and share in common the fundamental aim of fostering capacity development and higher levels of personal commitment to organizational goals” (p. 38).

APPENDIX B

EMAIL INVITATION TO TEACHERS

Dear _____ ISD High School Teacher:

You are being asked to participate in a _____ ISD-approved research study (<https://www.surveymonkey.com/s/teacheragency>) that I am conducting in preparation for my PhD in Educational Leadership and Policy Studies at the University of Texas—Arlington. The study examines the relationship between principal leadership behaviors, teacher motivation, and teacher behavior. If you decide to participate in this study and click the link below, you will be prompted to complete an online survey, which takes approximately 15 minutes to complete.

Surveys that make use of the Internet are not entirely secure; however, every attempt will be made to see that your participation in the study and that your results are kept confidential. To that end, none of the survey questions ask for personally identifiable information. Although the data will be stored online with Survey Monkey, Survey Monkey does not have any permission to use any of the data collected. I retain all rights to the data and will remove the survey data from Survey Monkey at the end of the study in approximately 6 months. While the results of this study may be published or presented at meetings, none of the participants, participants' schools, or districts will be individually identified. Additional research studies could evolve from the information you have provided, but your information will not be linked to you in any way; it will remain anonymous.

If you have any questions about this research study, you may contact the principal investigator Eric Boberg at john.boberg@mavs.uta.edu or the faculty advisor, Dr. Barbara Tobolowsky, at tobolow@uta.edu. Any questions you may have about your rights as a research participant or a research-related injury may be directed to the Office of Research Administration's Regulatory Services at 817-272-2105 or regulatoryservices@uta.edu.

Your participation is entirely voluntary and has no effect on your affiliation with your school, district, or employment in any way. Refusal to participate or discontinuing your participation at any time will involve no penalty or loss of benefits to which you are otherwise entitled. By following the link below and completing the survey, you confirm that you are 18 years of age or older and have read or had this document read to you.

To participate in the survey, please follow this link (from this document, hold the Ctrl key and press the link): <https://www.surveymonkey.com/s/teacheragency>.

Sincerely,

John Eric Boberg

Note: The follow-up reminder was the same letter with a slightly different opening: "Thank you to all of you who have participated already. The online survey closes in three days."

APPENDIX C

THE DEVELOPMENT OF THE SCHOOL LEADERSHIP SURVEY

First emerging in educational writings in the late 1980s, transformational leadership soon became the preferred type of leadership for schools facing restructuring efforts of the mid-1990s. Transformational leaders appeal to their followers' emotions and values in order to promote their capacities and commitments, resulting in extra effort and productivity (Leithwood & Jantzi, 2009). Although the vast majority of school-based studies of TL are indebted to Bass's non-school based work (1985, 1997) and many use elements of the Multifactor Leadership Questionnaire (MLQ) (Avolio & Bass, 2004), public schools are quite different from the government bureaucracies and business organizations in which the MLQ was developed.

Based on Bass' two-factor theory of transformational leadership, Leithwood's TSL construct has varied significantly in its number of dimensions over the past two decades. Inspired by Avolio's and Bass's work, Jantzi and Leithwood's (1996) original school-based TL model, called the Principal Leadership Styled Inventory, consisted of six TL dimensions—*identifying and articulating a vision, providing an appropriate model, fostering the acceptance of group goals, providing individualized support, and holding high performance expectations*—and two transactional dimensions—*management by exception and contingent rewards*. Although significantly refined, this early model continues to be used (Sagnak, 2010; Valentine & Prater, 2011). Hipp and Bredeson's (1995) confirmatory factor analysis found significant loading ($\geq .60$) for five dimensions of the seven proposed dimensions: *models behavior, inspires group purpose, provides contingent rewards, holds high performance expectations, and provides support*. Leithwood and Jantzi (1999, 2000) expanded their measure to 10 dimensions with 53 items, including dimensions related to transactional leadership. Subsequently, Yu,

Leithwood, and Jantzi's (2002) instrument used eight dimensions, which were re-organized into three broad, multi-dimensional clusters (Leithwood & Jantzi, 2006a).

More recently, Leithwood and Jantzi's model consisted of three broad categories related to TL in school: *setting directions*, *developing people*, and *redesigning the organization*. *Setting directions* consists of behaviors that promote "shared understandings about the school and its activities as well as the goals that undergrid a sense of purpose or vision" (Leithwood & Jantzi, 2009). *Developing people* consists of behaviors that reflect a leader's personal attention to employees, including intellectual stimulation, individualized consideration, and role-modeling found in the MLQ. Finally, *redesigning the organization* consists of behaviors that establish conditions that "support and sustain the performance of administrators and teachers, as well as students" (Leithwood & Jantzi, 2009). The current version, which includes a fourth cluster of behaviors related to *improving the instructional program*, has motivated several reviews and broad studies (Leithwood, 2012; Leithwood & Beatty, 2008)—none of which were conducted in the United States.

Leithwood's (2012) School Leadership Survey

The items below are used to measure four scales (see centered headings). The instrument has response options following the stem: *To what extent do you agree or disagree that your school's principal(s)* (scale 1-6: strongly disagree to strongly agree)

Direction Setting

1. Gives staff a sense of overall purpose.
2. Helps clarify the reasons for your school's improvement initiatives.
3. Provides useful assistance to you in setting short-term goals for teaching and learning.
4. Demonstrates high expectations for your work with students.

Developing People

5. Gives you individual support to help you improve your teaching practices.
6. Encourages you to consider new ideas for your teaching.
7. Models a high level of professional practice.
8. Develops an atmosphere of caring and trust.
9. Promotes leadership development among teachers.

Redesigning the Organization

10. Encourages collaborative work among staff.
11. Ensures wide participation in decisions about school improvement.
12. Engages parents in the school's improvement efforts.
13. Is effective in building community support for the school's improvement efforts.

Improving the Instructional Program

14. Provides or locates resources to help staff improve their teaching.
15. Regularly observes classroom activities.
16. After observing classroom activities, works with teachers to improve their teaching.
17. Frequently discusses educational issues with you.
18. Buffers teachers from distractions to their instruction.
19. Encourages you to use data in your work.
20. Encourages data use in planning for individual student needs.

APPENDIX D

THE DEVELOPMENT OF THE COLLECTIVE TEACHER EFFICACY SHORT FORM

Perceived collective teaching efficacy (CTE) was used to measure each teacher's beliefs about the combined capabilities of the teachers at each school. Goddard et al. (2000) defined collective teacher efficacy as the "construct measuring teachers' beliefs about the collective (not individual) capability of a faculty to influence student achievement" (p. 486). CTE was measured by the 12-item Likert-type instrument adapted by Goddard (2002) from a 21-item instrument developed and tested by Goddard et al. (2000). Both instruments were based on Gibson and Dembo's (1984) Teacher Efficacy Scale and Tschannen-Moran, Hoy, and Hoy's (1998) model of teacher efficacy. The instrument has a group orientation, measuring the sum of individual member's perceptions of their group's capacities. Bandura (2000) recommends an aggregated holistic measure instead of aggregated individual efficacy measure when teamwork is most crucial to achieve goals since the "holistic appraisal encompasses the coordinative and interactive aspects operating within groups" (p. 76). Although Bandura (1993) classifies schools as intermediate in terms of interdependence, schools faced with the demands of high-stakes accountability need to rely more heavily on organizational interdependencies than on the sum of individuals working in isolation. Therefore, the instrument asks individual teachers to rate their perceptions of the faculty as a whole. The individual teacher CTE score is the average of all 12 items.

Through a series of expert panel review, field tests, pilot tests, and statistical analyses, the instrument used to measure teacher capability beliefs in this study demonstrated reliability and validity. The final study included 452 elementary school teachers from one large urban school district in the Midwest. All 21 highly correlated ($r = .75, p < .001$) items loaded strongly (.61 to .93) on a single factor that explained 57.89%

of total variance and revealed high internal reliability (Cronbach's $\alpha = .96$) (Goddard et al., 2000). Moreover, testing the scale's construct validity, Goddard et al. demonstrated that collective teacher efficacy was positively correlated with aggregated personal efficacy ($r = .54, p < .01$) and trust among faculty ($r = .62, p < .01$), negatively correlated with teacher powerlessness ($r = -.51, p < .001$), and statistically uncorrelated with environmental press associated with unreasonable external demands. Using the same 21-item scale, Goddard and Goddard (2001) confirmed that a 1-*SD* increase in CTE was associated with a .25-*SD* increase in personal teacher efficacy, measured with Gibson and Dembo's (1984) instrument. Goddard (2001) found that a single factor accounted for 50.5% of the variance in collective teaching efficacy and that scale had a Cronbach's α of .96 with item loadings ranging from .47 to .87 and 17 items loading above .71. Similarly, Goddard and Goddard (2001) found a single factor accounting for 57.13% of the variance with a high internal reliability ($\alpha = .96$), and Goddard (2002) found a single factor accounting for 57.89% of the variance in collective teaching efficacy.

Goddard (2002) developed and tested a more parsimonious version of the Goddard et al. (2000) collective teacher efficacy scale. Drawing upon 452 teacher surveys from 47 elementary schools within one large urban Midwestern school district, Goddard maintained a balance of negatively and positively worded statements related to both group competence and task analysis dimensions of the original scale. The longer form had been disproportionately weighted 13:8 in favor of group competence. Of the 12 items, only one ("Home life provides so many advantages the students here are bound to learn") had a factor coefficient below .72; however, the item was supported by previous research and had an adequate coefficient of .65. Principal axis factor analysis revealed a

one-factor solution, explaining 64.10% of the variance in collective teaching efficacy, an eigenvalue of 7.69, and an internal reliability alpha of .94. Moreover, scores from the short-form were highly correlated with scores from the original 21-item form ($r = .98$). Finally, consistent with earlier studies using the longer CTE form, the short-form CTE instrument accounted for a significant amount of the variance in between-school student achievement in mathematics. Goddard and Goddard (2001) recommend controlling for mean SES, mean prior academic achievement, minority concentration, and school size when measuring the effect of collective efficacy.

Collective Efficacy Beliefs

Goddard's (2002) Collective Teacher Efficacy Short Form

The 12 6-point Likert-type items below are used to measure individual teacher's perceived collective efficacy of a school. The instrument has response options following the stem: *Please indicate your level of agreement with each of the following statements about your school from **strongly disagree** to **strongly agree**.* Items 3, 4, 8, 9, 11, and 12 are reverse scored.

1. Teachers in the school are able to get through to the most difficult students.
2. Teachers here are confident they will be able to motivate students.
3. If a child doesn't want to learn, teachers here give up.
4. Teachers here don't have the skills needed to produce meaningful student learning.
5. Teachers in this school believe that every child can learn.
6. These students come to school ready to learn.
7. Home life provides so many advantages that students here are bound to learn.
8. Students here just aren't motivated to learn.
9. Teachers in this school do not have the skills to deal with student disciplinary problems.
10. The opportunities in this community help ensure that these students will learn.
11. Learning is more difficult at this school because students are worried about their safety.
12. Drug and alcohol abuse in the community make learning difficult for students here.

APPENDIX E

THE DEVELOPMENT OF THE ENABLING SCHOOL
STRUCTURES SHORT FORM

Hoy and Sweetland's (2000) 24-item Enabling School Structure (ESS) questionnaire measures the degree of formalization and centralization of an organization. Formalization refers to the extent to which the organization is rule-driven while centralization refers to the extent to which the organization's decision-making is autocratic. The scale's reliability and validity were confirmed with a sample of high school teachers in Ohio. 97 high schools with 15 or more teachers from each school participated in the study. Factor analysis returned a single-factor solution accounting for 64.4% of the variance with factor loadings from .69 to .86 and strong internal consistency ($\alpha = .95$). Additionally, correlational analysis supported the scale's validity. Enabling school structures were positively correlated with *trust in principal* ($r = .76, p < .01$) and negatively correlated with *truth spinning* ($r = -.74, p < .01$) and *role conflict* ($r = -.71, p < .01$).

The shorter 12-item form was adapted from the longer questionnaire (Hoy & Sweetland, 2001). Studies with two different samples demonstrated the reliability of the scale. Drawing upon a data from 61 teachers from 61 different schools in Ohio, principal-axis factor analysis returned a single-factor solution with factor loadings from .40 to .81 and strong internal reliability ($\alpha = .94$). Similarly, drawing upon data from 116 teachers from five different states, factor analysis returned a single-factor solution with factor loadings from .53 to .81 and strong internal reliability ($\alpha = .96$). Correlational tests in these two studies also provided evidence of the scale's validity. Enabling organizations were negatively correlated with *dependence on rules* ($r = -.62, p < .01$), *dependence on hierarchy* ($r = -.25, p < .01$), and teachers' *sense of powerlessness* ($r = -.74, p < .01$), and positively correlated with teachers' *trust for colleagues* ($r = .61, p <$

.01). Additional work on the construct revealed that the ESS scale was positively correlated ($r = .89, p < 0.01$) with *trust in principal* and negatively correlated with both *truth spinning* ($r = -.74, p < 0.01$) and *role conflict* ($r = -.71, p < 0.01$).

Personal Context Beliefs

Hoy and Sweetland's (2001) Enabling School Structures Short Form

The 12 5-point Likert-type items below are used to measure an individual teacher's perceptions of the type of bureaucratic environment in the school. The instrument has response options following the stem: *Please indicate how often each of the following items occurs from **never**, **fairly often**, **sometimes**, **once in a while**, to **always***. Items 2, 4, 7, 8, 9, and 11 are reverse scored.

1. Administrative rules in this school enable authentic communication between teachers and administrators.
2. In this school red tape is a problem.
3. The administrative hierarchy of this school enables teachers to do their job.
4. The administrative hierarchy obstructs student achievement.
5. Administrative rules help rather than hinder.
6. The administrative hierarchy of this school facilitates the mission of the school.
7. Administrative rules in this school are used to punish teachers.
8. The administrative hierarchy of this school obstructs innovation.
9. Administrative rules in this school are substitutes for professional judgment.
10. Administrative rules in this school are guides to solutions rather than rigid procedures.
11. In this school, the authority of the principal is used to undermine teachers.
12. The administrators in this school use their authority to enable teachers to do their jobs.

APPENDIX F

THE DEVELOPMENT OF THE TEACHER ORGANIZATIONAL CITIZENSHIP BEHAVIORS SCALE

The construct validity for the following teacher OCB scale has been demonstrated in three separate factor analyses (DiPaola, Tartar, & Hoy, 2005), and its reliability has consistently appeared in the high to excellent ranges, $.86 \leq \alpha \leq .93$ (DiPaola, Tartar, & Hoy, 2005). This shorter form was derived from an earlier OCBS Scale (DiPaola & Tschannen-Moran, 2001).

DiPaola and Hoy's (2005) OCB Scale

The 12 6-point Likert-type items below are used to measure the degree to which teachers in the school participate in organizational citizenship behaviors. The instrument has response options following the stem: *Please indicate your level of agreement with each of the following statements about your school from **strongly disagree** to **strongly agree**.* Items 2 and 10 are reverse scored.

1. Teachers help students on their own time.
2. Teachers waste a lot of class time.
3. Teachers voluntarily help new teachers.
4. Teachers volunteer to serve on new committees.
5. Teachers volunteer to sponsor extracurricular activities.
6. Teachers arrive to work and meetings on time.
7. Teachers take the initiative to introduce themselves to substitutes and assist them.
8. Teachers begin class promptly and use class time effectively.
9. Teachers give colleagues advanced notice of changes in schedule or routine.
10. Teachers give an excessive amount of busy work.
11. Teacher committees in this school work productively.
12. Teachers make innovative suggestions to improve the overall quality of our school.

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BIOGRAPHICAL INFORMATION

Since receiving his dual-major BA in philosophy and political science from the University of North Florida in 1992, John Eric Boberg has taught high school English and electives for nearly 20 years. Frustrated with the growing routine nature of teaching and an extraordinary time commitment devoted to coaching and supervising a very active, traveling speech and debate squad, John Eric Boberg returned to graduate school in philosophy at the University of Florida in 1998, where he assisted with classes in logic, ethics, and philosophical writing. After completing the M.A. coursework, a love of high school education drove him to complete his MEd in Educational Leadership at Harvard in 2001, where he also took courses in curriculum design and development. Although his next stint as an English teacher provided greater opportunities for leadership, accompanying endeavors to promote institutional change prompted interests in organizational behavior that encourages a culture of change and innovation. Interested in developing his own leadership skills, he entered the ED-MBA program at TCU, where he subsequently completed a full MBA in 2009, focusing on economics and finance. Instead of continuing with the ED portion of the degree, he decoupled the degree programs and pursued a PhD in Educational Leadership and Policy Studies at the University of Texas at Arlington. His research interests include effective leadership behaviors, professional learning communities, and organizational change mechanisms such as efficacy beliefs and empowerment. In 2013, he began a new role as a Learning Innovation Specialist at a K-12 school that is working to promote a culture of learning and innovation that integrates technology with inquiry-based, problem-based, and project-based learning models.