**DISCLAIMER:**

This document does not meet the current format guidelines of the Graduate School at The University of Texas at Austin.

It has been published for informational use only.

**The Dissertation Committee for Breana Jeanne Sylvester Certifies that this is the approved version of the following dissertation:**

**Toward a Model of Factors Influencing**

**Teacher Self-Determination and**

**Professional Commitment**

**Committee:**

Marilla D. Svinicki, Supervisor

Diane L. Schallert

Edmund T. Emmer

Stephanie W. Cawthon

Yetkin Yildirim

# Toward a Model of Factors Influencing Teacher Self-Determination and Professional Commitment

**by**

**Breana** Jeanne **Sylvester, B.A.; M.A.**

**Dissertation**

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

**Doctor of Philosophy**

**The University of Texas at Austin**

**May 2011**

*This dissertation is dedicated to my family.*

*Their love and support have made this possible.*

# Acknowledgements

I would like to take this opportunity to acknowledge and thank the many people who have been such a large part of this wonderful time of learning and growth. I am fortunate to have been a part of this community of teachers, mentors, and friends.

First I would like to thank Dr. Marilla Svinicki, my advisor, my mentor, and my friend. I cannot express how fortunate I feel to have learned from her these past years, both personally and professionally. I aspire to use what I have learned from her and to someday be the teacher and mentor to my students that she is for so many. I am grateful for the opportunities she has given me to learn through collaboration and to grow as a teacher and Educational Psychologist. Next, I would like to thank Dr. Claire Ellen Weinstein, who has been incredibly generous in both spirit and opportunity. I am grateful for her belief in me and the opportunities she's given me to grow in teaching, research, and leadership. She has shown care and compassion for my family and for me throughout the years. Thank you also to Dr. Diane Schallert, and Dr. Dan Robinson, who have helped me develop as a writer and encouraged me to think big when it comes to my contributions to the field and to the world. I was lucky to have had such a supportive committee, and I thank Dr. Yetkin Yildirim, Dr. Edmund Emmer, and Dr. Stephanie Cawthon for both their hard work and their excellent advice on improvements to my study.

I could not have thrived through this process without the amazing support of my friends and family. My fellow students and coworkers are so wonderful to one another, providing both insight into being a successful graduate student and the emotional support

of the community learners. I would especially like to thank my fellow coordinator, Jaimie Krause, and my research partner, JaeHak, for all of their kindness and their time. Friends are one of the most beautiful things in life, and I am fortunate to have some amazing friends who have believed in me, celebrated with me, and shared my burden when it became heavy, I hope I can do the same for them throughout our lives. Thank you to Jessica and Clare, you both mean the world to me, you are a part of me and I will carry you both with me wherever I go. Thank you to Danielle, for sharing so much of this educational journey. To Zack, thank you for bringing such unique perspective to my life at just the right time, I hope we continue to open the world to one another.

To my family, I do not know how to thank you for the many experiences that shaped who I have become. Thank you for your love and your lessons and your patience. Thank you for letting me be myself even when I am difficult to understand. I love you Mom, Dad, and Megan. Last, thank you Matthew, for your love and support and for your companionship through life's great moments; on to the next great adventure!

# Toward a Model of Factors Influencing Teacher Self-Determination and Professional Commitment

Breana Jeanne Sylvester, Ph.D.

The University of Texas at Austin, 2011

Supervisor: Marilla D. Svinicki

Although previous research has examined the relationship of teachers' school context to both teacher motivation and retention (Coladarci 1992; Hoy and Woolfolk 1993; Uline 2008; Skaalvik and Skaalvik 2010), very little research has looked at the role of teachers' professional development experiences to these outcome variables, nor has the role of motivation in the relationship between school contextual factors and teachers' professional commitment been examined. This study tested a model of teacher motivation that measures the relationships of teacher background variables, professional development experiences, and school climate to teacher self-determination and professional commitment. Teacher self-determination was hypothesized in this model to mediate the relationship between these teacher background and contextual variables to teachers' professional commitment.

The fit of the model was analyzed using Structural Equation Modeling, with a multiple group analysis employed to determine whether significant differences existed between public and charter school teacher participants. Results of this investigation revealed that with some modifications, the proposed model obtained good fit (using

multiple fit indices) for both groups, with parameters allowed to vary freely. Due to possible differences between groups in measurement and structural model path coefficients, models for each group of teachers are interpreted separately. Implications of the final models as well as limitations of the study are discussed.

# Table of Contents

# List of Tables

## List of Figures

# Chapter I: Introduction

Teachers are leaving America's schools at higher rates than in any previous era. Between one-third and one-half of all teachers choose to leave the profession within their first five years in the field (Archer, 1999, Ingersoll & Smith, 2003). Nine percent of new teachers do not complete their first year (Black, 2001) and 14% leave after their first year (Ingersoll, 2002). "[After] the 2003–04 school year, 84 percent remained at the same school, 8 percent moved to a different school, and 8 percent left the profession," which was up from 5 percent leaving after the 1991-1992 school year (NCES, 2007, p.3). It seems clear that teacher attrition is not only a serious issue, but a growing issue facing America's school system.

***Teacher Experience and Quality***

A critical issue relating to teacher attrition is that of experience. High teacher turnover means less experienced teachers in classrooms. This is an especially serious problem in schools that serve traditionally underserved populations, with teachers serving these populations leaving in significantly higher numbers (Barnes, Crowe & Schaefer, 2007). According to the recent meta-analytic study of teacher attrition by Borman and Dowling (2008), teachers leave at significantly higher rates from urban schools, those with lower than average student socio-economic status, and those with lower than average standardized test scores. Additionally, teachers working in schools where the majority of students were ethnic minorities were three times more likely to leave than

teachers working at schools serving predominantly white students (Borman & Dowling, 2008). Research indicates that on average teachers with less than three years of experience are less effective than teachers with more than three years of experience, although these effects of experience seem to level off after five years of teaching (Rosenholtz, 1989). If less experienced teachers are less effective, students in schools with high numbers of inexperienced teachers are likely receiving an inequitable education. This negative impact of teacher turnover might best be illustrated by considering research on how teacher quality impacts student achievement. Hanushek (1992) found that the difference between being taught by a highly capable teacher and a less than capable teacher can translate to a whole year of learning for a child and can have consequences beyond the year in which the child had a low-quality teacher, translating to long-term, cumulative negative effects (Sanders & Rivers, 1996).

***Costs of Turnover***

Researchers have compared teaching to other female-dominated career paths such as nursing (Harris & Adams, 2007) and found significantly higher attrition rates in teaching. Alternatively, some lines of research focus on the qualifications of teachers choosing to leave versus those choosing to stay. Findings indicate that the most qualified secondary math and science teachers leave at higher rates than less qualified teachers, but for other sub-groups, the results are inconclusive (Stinebrickner, 1998, 2002; Borman & Dowling, 2008). However, regardless of the "health" of teacher attrition, factors influencing teacher attrition also impact district budgets. In a recent study by the National Commission on Teaching and America's Future, researchers Barnes, Crowe,

and Schaefer (2007) estimated the cumulative costs for every public school across the country to hire, recruit, and train the replacement teachers at 7.34 billion per year. By gaining a better understanding of factors that impact teacher turnover, districts might save money, allowing more financial resources to flow to other areas of need such as support staff, smaller class sizes, classroom learning resources, and teacher salaries.

***A cause of attrition: A lack of self-determination?***

Teachers report many reasons for leaving the profession, but among the most commonly expressed are inadequate support from the school administration, student discipline problems, limited faculty input into school decision-making, and low salaries (Ingersoll, 2001). When asked their opinions on how the school environment could better meet their needs, teachers have been very forthcoming. In a qualitative study by Certo and Fox (2002), teachers at all levels, K-12, mainstream and special education, asserted that "when professional development activities did not match teachers' individual needs, they felt that their time was not valued" (p. 64). Additionally, "teachers wanted more time for collegial interaction, for reflecting on teaching, and for completing necessary paperwork and planning to perform the job well" (p. 66).

In the same study (Certo and Fox, 2002), teachers expressed their frustration with their lack of ability to make positive changes for themselves and their students, "Teachers wanted more autonomy with regard to decisions made about school policy and student learning" (p. 65). These reports reflect clear examples of teachers whose needs are not being met in ways that result in motivation for teaching. In light of this teacher feedback, it seems that school contextual factors may be negatively impacting teachers' motivation

to stay in the field. This being said, it is important for researchers to understand better the interplay of teacher individual and contextual factors in teacher motivation and professional commitment.

It is clear from these reports that teachers' needs are not being met within school environments. It seems likely that one of the many reasons teachers are not motivated to stay in the field is because the school environment does not allow them to be self-determined. Self-determination theory (Deci & Ryan 1985) states that individuals are motivated when they are able to internalize a task, or see how it is consistent with their goals and sense of self (Ryan & Deci, 2000). According to Self-Determination Theory, individuals are constantly striving to meet their needs for autonomy, competence, and relatedness. When they are successful, they are said to be self-determined and their motivation toward a task is internalized. When examining teachers' participation in Professional Development opportunities in the context of self-determination theory, it makes sense that teachers who are continually learning and implementing more effective instructional methods in the classroom would be better able to meet their needs for competence. In turn, once teachers have shown their ability to bring about positive gains in student achievement, they are often given greater amounts of decision-making power within their classrooms and teams, which could lead to greater perceived autonomy. Last, often modern professional development activities involve teachers working together in groups toward common goals, which would seem to support relatedness and autonomy needs.

It is possible, then, that the school environment is not giving some teachers the necessary tools with which to meet their self-determination needs, and, as a result, they choose to leave the field and find a place where these needs are better met. If this is the case, there should be a clear relationship between teachers' perceived self-determination and their self-reports of professional commitment. Vaughan (2005) tested a hierarchical model of the relationships of school and teacher level variables to teachers' Self-Determination, and then Self-Determination to teachers' Professional Commitment. Vaughan was interested in whether teachers' Self-Determination was significantly different under different conditions and whether this Self-Determination contributed significantly to teachers' Professional Commitment. The teachers in Vaughan's sample (N=1,390) were secondary school teachers from 75 schools in a southern state in the United States. Significant findings from this study included: 1) that teachers within schools varied significantly in terms of Self-Determination whereas overall school levels of self-determination did not (regardless of school ratings), 2) A significant positive relationship was found between self-determination and professionalism both at the school and teacher level, 3) a significant positive relationship existed between levels of positive relationships within the school and self-determination at both the school and teacher level, and 4) teacher experience positively predicted teacher self-determination at the individual level. The relationship of teachers' motivational orientation to self-determination was found significant, but not once years experience were controlled in the model.

These significant findings from Vaughan's (2005) dissertation provide support for many of the relationships within the model in the current study. First, the relationship between the 'Relationships Within Schools' variable and Self-Determination is mirrored in the path between School Climate and Self-Determination in the model. Second, the significant relationship of teacher background variables such as years experience and quality of field experiences to Self-Determination are included in the model. Third, the connection between Self-Determination and Professional Commitment is mirrored within the model. However, while Vaughan's (2005) study examines the relationship of teacher background and school variables to Self-Determination, and Self-Determination to Professional Commitment, the current study includes a broader exploration of teachers' perceptions of school climate as well as a measure of teachers' experiences of professional development as predictors of both self-determination and professional commitment and examines the mediating role of self-determination in the relationship of these predictor variables to professional commitment.

### *Teacher Learning and Professional Development*

Researchers have identified characteristics of professional development that are associated with positive changes both in teacher practice and student achievement. These salient features of effective professional development include: structure, active learning, collective participation, content focus, coherence, and duration (Garet et al., 2001; Desimone et al., 2002; Boyle et al., 2005). Much recent research on professional development has related effective characteristics of professional development to changes

in teacher learning and instructional behaviors (Batt 2010; Ermeling, 2010; Goldschmidt & Phelps, 2010; Mouza, 2009), and student achievement outcomes (Gallimore, Ermeling et al. 2009), although some work has focused on other outcomes such as professional commitment changes in classroom culture (Smith & Rowley, 2005; Supovitz & Turner, 2000). Few studies have examined teacher attitudes or motivation associated with professional development experiences (Smith & Rowley, 2005). The current study examines the relationship between teachers' participation in these highly effective types of professional development and their motivation and professional commitment. In order to examine this relationship, a new scale was constructed to measure teachers' professional development experiences over time.

One theoretical construct that has been tied to increases in teacher motivation is that of School Climate. Over the last sixty years, the concept of organizational health has been studied in a variety of contexts. More recently, researchers have developed constructs that aim to measure the health of school contexts from the perspectives of teachers (Bandura, 1993; Tschannen-Moran & Hoy, 2001) and students (Brand et al., 2003; Brand, et al., 2008). School Climate has been positively related to the motivational construct of teacher self-efficacy in a number of studies (Hoy, Hoy et al., 2008; Hoy & Spero, 2005; Hoy & Woolfolk, 1993; Tschannen-Moran, Hoy et al., 1998; Tschannen-Moran & Hoy, 2007), as well as positively related to student outcomes (Brand, et al., 2008; Brand, Felner et al., 2003; Uline, 2008).

***Teacher Background***

Previous studies examining the relationships of teacher background variables to teachers' professional commitment have found relationships between teacher experience and teacher attrition (Ingersoll & Smith, 2003). Research on certification status and method of certification has produced mixed results in terms of teacher performance and teacher attrition, with some studies indicating that the nature of teachers' field experiences may be a moderating factor in this relationship (Borman & Dowling, 2008). No previous research has examined the relationship when teachers' self-determination is entered into the model as a mediating variable. To that end, the teacher background variable in this study examined teachers' experience, education and certification method, and pre-service field experience in relation to teachers' self-determination and professional commitment.

The purpose of this study was to create and test a model of the relationships between teacher background and contextual factors contributing to teachers' self-determination and professional commitment. The unique contribution of this study is twofold. First, this study introduces the "Teacher Professional Development Experiences and Perceptions" Scale. This scale, while based on the work of previous research in the area of professional development and its effects on teacher attitudes and practices (Desimone, 2009; Desimone, Porter, et al., 2002; Garet, Porter, et al., 2001) is unique in that it is measuring teachers' perceptions of professional development experiences across time rather than in one instance. The second unique contribution is the development of the model itself. Although many of the relationships within the model have been examined in previous literature, no previous study has looked at these relationships as a

whole to determine the strength of the relationship with all of the variables entered into the model.

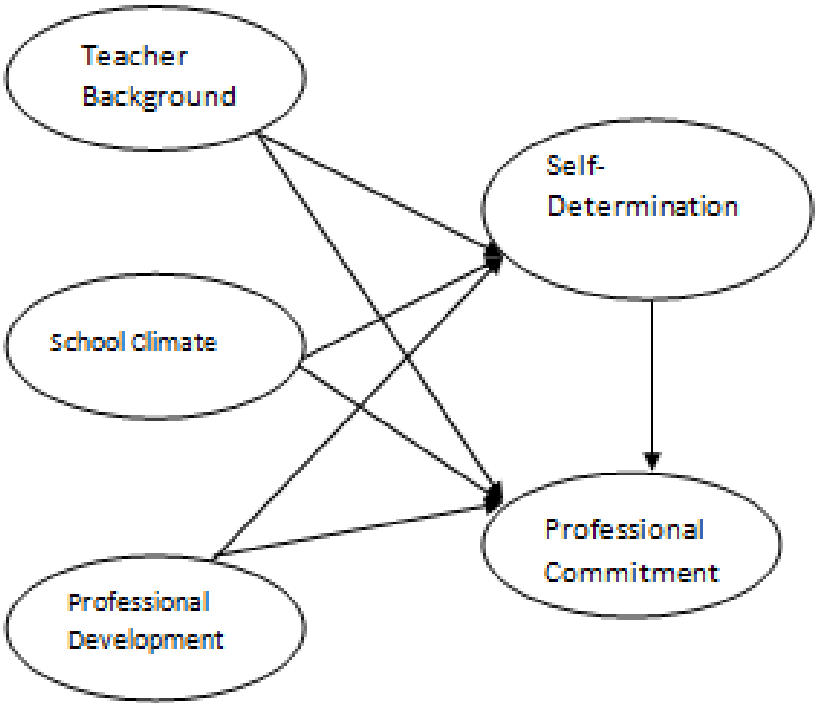


Figure 1: Proposed structural model for the current study.

Participants in this study were from two distinct groups. The first sample was a group of teachers from a cluster of charter schools located in a state in the southwest portion of the United States. Teachers from 17 campuses across the state were invited to complete the measures. In this sample, 257 surveys were completed. The second was collected through convenience sampling involving personal teacher connections including personal email and social networking contacts, groups of teachers on educational listservs as well as by asking teachers who chose to participate to share the

survey with their colleagues. In the traditional public school sample, 258 surveys were completed. Due to the potential differences between the two samples of teachers, results from this study were analyzed utilizing Multiple Group Structural Equation Modeling.

***Research Questions***

The following questions were investigated as part of the testing of the model:

1) To what extent do teachers' background characteristics predict teachers' perceptions of self-determination and professional commitment?
2) To what extent can the teachers' reports of school climate predict teachers' perceptions of self-determination and professional commitment?
3) To what extent do teachers' professional development experiences predict teachers' perceptions of self-determination and professional commitment?
4) To what extent do teachers' perceptions of self-determination predict professional commitment?
5) How does including self-determination in the model as a mediator variable affect the relationship between each of the predictor variables and professional commitment?
6) Are the relationships between measured and latent variables in the model of traditional public school teachers significantly different from those in the model of charter school teachers?
7) Are the strengths of relationships between variables (paths) significantly different for traditional public school teachers as compared to charter school teachers?

# Chapter II: Review of the Literature

Self-Determination theory posits that all human beings have three basic psychological needs: autonomy, competence, and relatedness and that individuals who are able to interact with their environment in ways that meet these needs have greater motivation toward tasks because of their inherent worth to the individual (Deci & Ryan,

2000). It is because of this role of self-determination in motivation and well-being that the current study investigated the relationship of teachers' experiential and educational personal and environmental characteristics in relation to their self-determination and professional commitment. To provide the basis for this model, the following section includes discussions on professional commitment, teacher professional development, self-determination theory, self-efficacy theory, school climate, as well as relevant theory and research on teacher educational background and training.

### *Professional Commitment*

For the purposes of this study, the outcome measure of Professional Commitment represented not only teachers' intentions to stay in the field (long-term career planning) but also their active school participation and voluntary ongoing professional development and educational pursuits. The use of these three aspects of professional commitment were first utilized in a study by Vaughan (2005), where all three were found to be significantly positively correlated to teachers' self-determination as measured by perceptions of autonomy, competence, and relatedness.

*Long-term Career Planning.* Research on teacher stress and teacher burnout provides some insight into common causes for teacher attrition. This line of research finds that both individual factors and school-level factors may play a part in teachers' stress and job satisfaction. In one such study, Stockard and Lehman (2004) examined first year teacher job satisfaction and its relationship to their decision to remain in the field. They found that that social support and school management were highly correlated

with teachers' job satisfaction and decisions to stay. Similarly, a longitudinal study by Burke and Greenglass (1996) found that teachers' reports of unnecessary bureaucratic red tape, unsupportive administration, and disruptive students were correlated with teacher burnout. If teachers find that the demands of the teaching environment are not met with adequate support from administrators, colleagues, and opportunities, it is not surprising that many teachers begin to think about possible alternative careers paths.

*Active School Participation.* Research on effective schools has found ties between teacher retention and school characteristics, but some research has also indicated the importance of active school participation to teacher motivation, healthy overall school climate, and student achievement (DiPaola & Hoy, 2005; DiPaola & Tschannen-Moran, 2001). Active school participation can be defined as teachers' voluntary participation with student groups. This might include choosing to offer after-school tutoring to groups of students or to sponsor or lead extracurricular student activities. The measure of active school participation is based on teachers' past and current involvement with student groups as well as future intentions of participation.

The line of research on Organizational Citizenship of teachers is closely aligned with active school participation as conceptualized in the current study. Teachers who engage in Organizational Citizenship Behavior (OCB), "help students with class materials, acquire expertise in new areas that contribute to their work, prepare special assignments for higher- or lower-level students, volunteer for school committees, set up learning programs for substitute teachers, help absent colleagues by assigning learning

tasks to their classes, and work collaboratively with others", just to name a few (Bogler & Somech, 2004, p. 280). Research on OCB indicates teachers who work in schools with healthier school climate (DiPaola & Tschannen-Moran, 2001), higher levels of faculty trust in administrators (Tschannen-Moran, 2003), and who are given more decision-making power in their work (Porter, Lawler, & Hackman, 1996) generally score higher on measures of organizational citizenship behavior. Additionally, this line of research has linked teachers' choice to participate in these activities to higher levels of teacher self-efficacy (DiPaola & Tschannen-Moran, 2001), and greater teacher empowerment (Bogler & Socmech, 2004). Furthermore, higher OCB at the school level is associated with greater student achievement (DiPaola & Hoy, 2005; DiPaola & Tschannen-Moran, 2001). These findings together may provide indirect support for the roles of autonomy (decision-making), competence (gains in student achievement, greater self-efficacy), and relatedness (healthy school climate & trust of administrators) in teacher professionalism as they relate to active school participation.

*On-going Professional Development.* This aspect of teachers' professional commitment relates to the propensity of some teachers to commit themselves to ongoing voluntary professional development beyond that which is required. Based on the occupational research involving self-determination as a construct, teachers who choose to participate in regular professional development opportunities might have higher perceived self-determination because the increases in learning may support teachers' needs for competence and relatedness (Baard & Deci et al., 2004). Additionally, teachers

who conceptualize the role of teachers as lifelong learners are likely to have internalized goal structures which include continuing education and experimentation on innovative methods. Healthy school climates are likely to also encourage teachers' continuing professional development because administrators who are supportive of teachers' efforts to improve their instruction may help foster environments the scholarship of teaching and learning become part of the school culture. Last, previous successful and supportive professional development experiences are likely to encourage teachers toward voluntarily taking part in future professional development opportunities.

## Motivational Theories

### *Self-Determination Theory*

*Definition.* Self-Determination Theory is a motivational theory, in which to be Self-Determined one's actions must be in-line with his or her sense of self. In other words, one's actions must be perceived as not being the result of coercion from outside sources. "Both self-determined and controlled behaviors are motivated or intentional, but their regulatory processes are very different" (Deci, Vallerand, Pelletier, & Ryan, 1991, p. 327). Self-Determination theory operates under the assumption that all humans have three basic psychological needs: autonomy, competence, and relatedness, and their motivations are derived from their perceptions of the fulfillment of these needs (Deci & Ryan, 2002). It is assumed that these needs are organismic, that individuals naturally seek to have these needs met (Deci & Ryan, 1985). The social environment and personal

characteristics can influence the ways in which individuals' are motivated to meet their need to perceive themselves as self-determined.

### *Foundational Theories*

*Basic Psychological Needs Theory.* In order to function in our jobs and our lives, we all must accomplish tasks that are important but not necessarily interesting or fun. We must either be intrinsically motivated to perform a task, have internalized the importance of the task to society, or if we do not see the usefulness of the task we must be coerced in some way (Deci & Ryan, 2000). Where these motivations originate can have a profound impact on our sense of self and our willingness to take on similar tasks in the future. For example, if a teacher is required by the administration to attend meetings of the school's Parent-Teacher Organization, she may respond to this requirement in multiple ways. If she does not see how the material covered at the meetings will benefit herself or her students, she is much more likely to react negatively than if she values the opportunity to get to know her students' families and what they want from their school.

Self-determination theory proposes that individuals who have their psychological needs met in healthy ways will either be motivated to accomplish important tasks because of their inherent worth to the individual (intrinsic motivation), in which case the individual is likely to have interest in the task, or because they perceive the task as valuable to their sense of self and their goal structure (internalization) (Deci & Ryan, 2002).

*Autonomy* in this context is conceptualized as the individual perceiving that they have the ability to make changes in their environment that are in line with their goals and values. Autonomy does not, however, necessarily mean control. Individuals can be self-determined without having control of the situation (Deci, 1980). However, individuals must have a perception of autonomy in order to be intrinsically motivated rather than controlled (Deci et al, 1991). An example of this would be a teacher whose administration comes and visits her classroom regularly and gives feedback. She may view this as them being critical and interfering with the way she teaches, or she make take the opportunity to learn how others view her teaching and use this as part of her reflections to self-evaluate. While a great deal of research has linked teachers' autonomy-supportive behaviors in the classroom to positive student outcomes (e.g. Black & Deci, 2000; Ciani, Middleton, Summers, & Sheldon, 2010; Stefanou, Preencevich, DiCintio, & Turner, 2004), there is much less research from the perspective of self-determination theory linking autonomy support of the teacher herself to positive teacher outcomes. One such study by Taylor and Ntoumanis (2010) looked at the self-determination of physical education teachers in relation to their use of positive motivational strategies with their students. Researchers confirmed a model "in which perceived job pressure, perceptions of student self-determination, and teacher autonomous orientation predicted teacher psychological need satisfaction, which, in turn positively influenced teacher self-determination" (p. 88). Higher levels of self-determination among the physical education teachers were associated with greater use of motivational strategies with their students.

*Competence* in Self-Determination theory refers to a person's perceptions of their abilities rather than their actual ability levels. When individuals feel competent in an area they are more likely to take risks and seek opportunities to develop their skills (Deci & Ryan, 2002). Competence, as described by Deci and Ryan (1985), shares many characteristics with the social cognitive theory construct of self-efficacy. In fact, in many of their works, authors Deci and Ryan use the terms interchangeably (Deci & Ryan, 2000; Ryan & Deci, 2000). However, what makes competence a part of self-determination is its unique utility, "the experience of competence in and of itself is a source of satisfaction and a contributor to well-being over and above any satisfaction resulting from the outcomes that competence might yield" (Deci & Ryan, 2000, p. 257). Competence reflects the natural tendency of individuals to grow and learn, to reach beyond their current understanding. The need for growth must come from within in order to be self-determined. This can happen either through internalization or intrinsically motivated regulation (Ryan & Powelson, 1991).

*Relatedness* refers to an individual's relationship with others, their sense of community and belonging. Relatedness is by definition dependent on social interactions. Individuals with a positive sense of community are more likely to internalize important tasks because these tasks are requested by members of the community and serve the greater good of that community (Deci & Ryan, 2002).

Although self-determination refers to a person's individual motivational regulation, and relatedness is an inherently social construct, the individual and the social

environment cannot be divorced. We are formed by our social surroundings, and our goals and sense of self are inextricably tied to our environmental experiences. "Relatedness needs play an important role in the process of cultural transmission and internalization of values, and accordingly, in educational contexts as well" (Ryan and Powelson, 1991, p. 53). As such, it is important to also take into consideration the individual's responses to the environment and how these interactions influence the person's motivational regulation.

*Organismic Integration Theory.* When individuals take pleasure or satisfaction in an activity and engage in that activity for its own sake, they are intrinsically motivated to perform the activity (Deci et al, 1991). For example, when a student decides to keep a journal to jot down anecdotes and ideas for short stories, the student's motivation is intrinsic if the student enjoys the task and does it solely for this enjoyment and satisfaction. On the other hand, if the students' teacher tells them that they must keep a journal for a grade but the student has no interest in the task, the student's motivation to accomplish this task might be to get a good grade, impress the teacher, or avoid punishment, and would therefore be extrinsic.

While this dichotomy (of intrinsic vs. extrinsic) is useful for discussing motivation, it oversimplifies human behavior because often our actions are extrinsically motivated but their value is, nevertheless, internalized. In other words, while intrinsically motivated acts are always self-determined, extrinsically motivated acts may or may not

be self-determined depending on the degree to which the individual's actions are in-line with his or her sense of self and are internalized (Rigby, Deci, Patrick, & Ryan, 1992).

Internalization and Integration are the processes by which extrinsically motivated actions can become self-determined. Deci and Ryan (1985) specify four types of extrinsic regulation that are differentiated according to the degree to which they represent self-determined behavior. External regulation occurs when an individual takes on a task solely for external reward or avoidance of punishment, such as when a child eats his peas to get dessert, or in an educational context, when a teacher attends a district-mandated workshop for which they have no interest in the topic solely to keep from being reprimanded by administrators (Deci, Eghrari, Patrick, & Leone, 1995).

Introjected behaviors can be characterized as having some internal qualities, for example, tasks which we know we "should" or "should not" perform. Introjected motivation does not require external provocation; however the task motivation is not a part of the individual's sense of self (Rigby et al, 1992). An example of an individual whose motivation is introjected would be a teacher whose administration requires the students to use an Accelerated Reading computer program to keep track of the books they've read. If the teacher already had a system to do this and switches only because the administration is requiring it then his or her motivation would be extrinsic and introjected.

Identified regulation occurs when the motivation for a task is tied to an individual's sense of self. For example, children may complete their homework because

they want to do be seen as a good student. The homework is instrumental to an individually selected goal. The child need not enjoy the task, but must find it valuable (Deci and Ryan, 1985).

Integrated regulation is the most self-determined form of extrinsic regulation. In order for motivation toward a task to be integrated, the action must be an integral part of the individual's sense of self. Learning outcomes of students whose motivation toward a learning task is integrated are expected to be similar to those of students whose motivations are intrinsic: Cognitive flexibility, depth of processing, and creativity (Rigby et al, 1992) are characteristics of both types of regulation. The key difference between integrated extrinsic regulation and intrinsic regulation is that integrated motivational regulation is a means toward a related goal that involves sense of self, whereas intrinsically regulated acts are self-motivating (Deci et al, 1994). An example of teacher behavior that is integrated would be a teacher who sees herself as an expert on use of manipulatives in the mathematics classroom who chooses to attend workshops on the topic whenever they are offered in order to support that image. If the teacher were going simply because she enjoyed learning about using manipulatives in the mathematics classroom then she could be said to be intrinsically motivated.

It is also possible for individuals to experience amotivation. This state is characterized by actions lacking intent. According to Deci and Ryan (2000), an amotivated state can result from, "individuals lacking the ability to regulate themselves with respect to a behavior" (p. 237). In other words, if individuals feel that it doesn't

matter what they do, they will not be able to change an outcome, and they may become amotivated.

The theorized relationship between self-determination and internalization suggests that individuals can become more self-determined when they are able to see how a behavior is consistent with their self-concept. This may be important to classroom teachers because they are constantly being asked to incorporate new policy, content, and strategies into their teaching. For example, many school districts require that all students take quarterly benchmark exams for core content areas in addition to the required state testing. Teachers may choose to view administering these benchmarks as just one more hurdle they have to jump to prove they are doing their job (extrinsic motivation) or they may choose to view the benchmark assessments as a valuable method by which to gain insight into students' understanding of the material. Choosing to view the requirement as an external motivator and out of one's personal goal structure might result in decreased teacher self-determination. In the second instance, the teacher has internalized the value of the district benchmarks and is therefore likely to be more self-determined in his or her teaching.

*Cognitive Evaluation Theory.* Although teachers can and do choose how they will view tasks assigned to them by their superiors, administrators may also make choices that foster or impede teacher self-determination. Cognitive Evaluation Theory is a sub-theory of Self-Determination Theory which deals with how contextual factors affect motivation. The way in which expectations, policies, and consequences are handled by the

administrator can influence whether an individual internalizes the desired behavior. Controlling behaviors, such as requiring teachers to spend 20 minutes of their planning time calling parents, and then praising them when they do can undermine teachers' self-determination and therefore negatively affect their motivation (Deci & Ryan, 1985). Autonomy-supportive behaviors, such as recognizing the progress of a group of students for which the teacher had developed a unique tutoring program, support self-determination and are therefore likely to increase teacher motivation (Deci & Ryan, 1985). Another example of an autonomy-supportive behavior might be allowing the teachers to democratically decide on the best way to keep in regular contact with the parents of their students (by giving choices, teachers can choose the option that best fits their self-defined goals for teaching). Cognitive Evaluation theory stresses the importance of the autonomy and relatedness constructs in Basic Psychological Needs Theory because it specifies how others' actions can promote or undermine another's self-determination and motivational regulation.

*Causality Orientations Theory.* The actions of others aren't the only factor that can affect an individual's self-determination and motivation. Different people tend to view their environment in different ways as well. Causality Orientations theory is another sub-theory of Self-Determination Theory. This theory describes three ways that people tend to orient themselves toward their environment and how this affects their internalization of important/ required tasks and this orientation, in turn, affects how well

their environment will meet their needs (Deci and Ryan, 2000). These three types of orientations are autonomous, controlled, and impersonal.

Individuals with an *autonomous* causality orientation tend to view communication from superiors as informational. For example, a teacher who has been told she must record observations for all special-needs students may choose to do so in ways that will best suit her instructional style and the needs of the child. An Autonomous Causality Orientation has been associated with greater satisfaction of autonomy, competence, and relatedness needs, and higher performance evaluations at work (Baard, Deci, and Ryan, 2004). Individuals who are autonomously oriented are more likely to be intrinsically motivated or have integrated extrinsic motivational styles and are therefore better able to meet their own basic psychological needs.

Individuals whose causality orientations tend to be *controlling* are more likely to view the same communications from superiors as controlling their behavior (Deci & Ryan, 2000). Using the same scenario, the teacher might follow the instructions to record observations, but her compliance might undermine her motivation toward her work. Because these individuals are not able to tie required actions into their sense of self, they provide themselves with less opportunity to meet their needs for autonomy, competence and relatedness.

Last, some individuals can be thought of as having an *impersonal* causality orientation. These individuals tend to react erratically or unintentionally and are characterized by not thinking of the consequences of their actions. Individuals with this

orientation often believe they have no control over the outcome of a situation and therefore tend to develop a type of "personal helplessness" (Deci & Ryan, 1985, p. 159). An impersonal causality orientation has been associated in the literature with being amotivated (Deci & Ryan, 2000).

Together these four theories comprise different, yet interrelated, aspects of Self-Determination theory. An example of how this might work would be a teacher who tends toward a controlling causality orientation, but because of the autonomy-supportive nature of her environment, she is able to internalize the tasks that are being required of her. This internalization, in turn, allows her to better meet her needs for autonomy, competence and relatedness and she becomes more motivated toward her teaching.

***Relevant Research on Self-Determination***

High levels of self-determination have been associated with several positive outcomes in education. Little research has been conducted on the benefits of teacher self-determination for teachers themselves. However, studies linking self-determination to positive outcomes have been reported for other populations and settings such as within the workplace and with children in schools. With these populations, several studies have linked internalization, intrinsic motivation, and higher achievement to higher levels of self-determination (Deci et al., 1991; Deci et al., 1994; Deci & Ryan, 1985; Goudas, Biddle, & Underwood, 1995).

Research in work organizations has also focused on ways employers can promote self-determination in the work environment. Baard's 2002 study results include some recommendations for possible ways to promote self-determination within the workplace. These recommendations include reducing or eliminating excessive rules, making failure acceptable, phrase feedback in a manner that is not controlling, and avoiding systems of behavior reinforcement that are manipulative. Similarly, Baard suggested managerial behaviors for building perceptions of competence and relatedness in the workplace. These include removing barriers that might limit the efficiency of employee performance, meeting to agree on mutual achievable goals, helping employees to set reasonable ambitions for their job, sharing information whenever possible, and implementing reward structures that support cooperation (Baard, 2002). It remains to be seen whether these suggestions for increasing employee autonomy, competence, and relatedness in work organizations will be effective in a school setting, but many of these recommendations echo the needs expressed by teachers in terms of environmental support from the administration (Certo & Fox, 2002, Ingersoll, 2001).

While few studies have looked at teachers' self-determination in relationship to their school environment, one study which addresses this relationship is of particular importance to the current research. Vaughan (2005) tested a hierarchical model which examined the relationships of school level variables (school ratings, levels of positive relationships between teachers and administrators), and individual level variables

(teachers' motivational orientation, background, education) in relation to both school and teacher level self-determination.

Vaughan's study found significant relationships between teachers' educational background and Self-Determination, as well as teachers' positive relationships between teachers and administrators. Additionally, Self-Determination contributed positively to teachers' Professional Commitment at both the individual and school levels, although the teacher level relationship was three times stronger than the school level.

### *Related Research*

*Individual differences in responses.* Many researchers who study teacher stress and burnout also focus on teachers' emotional responses and coping mechanisms associated with their perceptions of stressors. In their 2005 meta-analytic study, researchers Montgomery and Rupp's findings indicated that " the degree in which teachers emotionally respond to stressful events and how satisfied they are as a consequence, either mediated through coping mechanisms or not, has a strong influence on the degree of burnout they experience" (p. 479). Chang's (2009) work on teacher appraisals of environmental stressors supports these findings, indicating that it may be important to examine how teachers perceive work-related stressors as well as the causes of those stressors.

### *Teaching Self-Efficacy*

While there is limited research evidence directly connecting teachers' self-determination to their professional commitment, there does exist a well-developed body of literature on a theoretical construct which shares some conceptual meaning with teacher self-determination. Teacher efficacy has been defined as "the extent to which the teacher believes he or she has the capacity to affect student performance" (Berman, McLaughlin, Bass, Pauly, & Zellman, 1977, p. 137), or as "teachers' belief or conviction that they can influence how well students learn, even those who may be difficult or unmotivated" (Guskey & Passaro, 1994, p. 4).

For the purposes of this study, Self-Determination Theory has been chosen as the motivational construct because it recognizes an individual's basic psychological need toward not only growth and mastery (competence), but also the needs for autonomy and relatedness. The concept of teacher efficacy stems from the construct of self-efficacy based on the research of Social Learning Theory and Social Cognitive Theory (Rotter, 1966 as cited in Tschannen-Moran & Hoy, 1998), and Bandura (1986, 1997). Self-efficacy is not based on an individual's actual ability to perform a task, but rather their self-perception of their competence. Competence, as operationalized by Self-Determination Theory (Deci & Ryan, 2000), is unique from perceived self-efficacy in that the individual's striving toward a goal (for example, supporting students' learning of math concepts) is motivated not only by their belief in their capacity to reach that goal, but in an innate desire toward growth and learning (competence). In this way, "self-efficacy theory view stands in sharp contrast to [Self-Determination Theory's] idea of a

*need* for competence, which implies that the experience of competence in and of itself is a source of satisfaction and a contributor to well-being over and above any satisfaction resulting from the outcomes that competence might yield" (Deci & Ryan, 2000). Additionally self-efficacy theory does not take into account the basic psychological needs of human beings to strive toward meeting their needs for autonomy and relatedness. In Social Learning Theory, the foundational theory of self-efficacy theory, there is no clear distinction between agentic behavior that is autonomous versus behaviors that are controlled, the implications to this research being that there would not be differences in teachers' motivation and well-being when teachers are working toward goals they are intrinsically motivated toward and goals that are imposed on them from administrators and policy-makers. One possible example of this might be teachers' motivation toward facilitating student learning versus their motivation toward their students obtaining high standardized test scores.

While it is important to take into account the differences between perceived Self-Efficacy and Self-Determination Theory, the similarities in the two concepts make the breadth and depth of research on teacher Self-Efficacy salient to the proposed study. Self-Efficacy researchers have found many correlates of teaching Self-Efficacy and collective teaching efficacy to positive outcomes for teachers, students, and schools. Early research on teacher self-efficacy reported that teachers' perceived efficacy was positively correlated with teachers' persistence when students were not understanding material (Gibson & Dembo, 1984), as well as student achievement in math and language

(Ashton & Webb, 1986), and negatively correlated with teachers' job-related stress as well as with teacher attrition (Glickman & Tamashiro, 1982).

A second wave of research on teacher efficacy, spurred by the development of Gibson & Dembo's (1984) instrument on teacher self-efficacy, supported earlier findings that found positive correlations between teacher's perceived self-efficacy and student achievement (Moore & Esselman, 1992; Ross, 1992). The work of Emmer and Hickman (1991) established a subscale of teacher self-efficacy relating specifically to teachers' classroom management practices, finding that teachers with higher classroom management self-efficacy were more likely to seek help for student discipline problems. This finding is of interest to the current study as it establishes a connection between teachers' perceptions of capability for dealing with student issues and their choices to seek help from other teachers and administrators, which might in some ways relate to the interaction of school climate and teachers' self-determination.

Another notable study found that teacher perceived self-efficacy was positively associated with teachers' professional commitment in elementary and middle-school teachers (Coladarci, 1992). In this study, professional commitment was measured by teachers' statement of desire to still teach if they were making their career decision a second time given what they now know about the profession. It may be important to note that this measure of professional commitment is conceptually different from the measure used in this study, which attempts to address professional commitment from a three-fold

perspective (long-term career planning, active school participation, and choice to participate in ongoing professional development).

Hoy and Woolfolk (1993) organized self-efficacy theory into two dimensions, general teaching efficacy (GTE) and personal teaching efficacy (PTE). General teaching efficacy is conceptualized as the perceptions individual teachers have about what can be accomplished as a teacher. For example, teachers who believe that without adequate parental support, student behavior issues are impossible to fully address may manage classroom behavior differently than a teacher who believes that school and classroom communities can help all students to become productive classroom citizens. Relatedly, personal teaching efficacy can be conceptualized as what an individual teacher believes in terms of his or her own ability to influence positive changes in student achievement and motivation. The Teacher Sense of Self-Efficacy Scale (Tscannen-Moran & Woolfolk- Hoy, 2001) has been used in a number of studies looking at the relationship of teacher efficacy to years of teaching experience, school climate, school leadership and trust, teachers' organizational citizenship behavior, and professional development, all of which are relevant this study.

Research also indicates that for novice teachers, different factors influencing teaching efficacy are more salient than for experienced teachers. For example, in a study by Tschannen-Moran and Hoy (2007), novice teachers' sense of teaching efficacy was more influenced by available teaching resources and interpersonal support than experienced teachers, whose self-efficacy was more influenced by mastery experiences.

Additionally, Woolfolk and Spero (2005) found that individuals' teaching efficacy tends to increase during student teaching experiences, but then decreases during the first year of teaching. The findings indicated that decreases in teachers' efficacy were associated with levels of support received, which indicates that some combination of support structures within the school may be negatively impacting teachers' self-efficacy in their early careers.

***School Climate***

School climate research evolved out of both organizational climate research and school effects research, and focused on a variety of aspects of the school environment, including school ecology, milieu, social systems, and school culture (Anderson, 1982). For the purposes of this study, however, School Climate constructs that are directed at teachers' perceptions of their school environment, and that have been studied in association with teacher outcomes are of greatest interest.

Early research on organizational health (a more general construct used in a variety of workplace conditions) (Halpin & Croft, 1963; Hoy & Feldman, 1987) preceded the creation of a climate measure that focused exclusively on educational environments. Researchers Tschannen-Moran, & Hoy (2001) developed an instrument measuring school climate as represented from teachers' perspectives. This work presents school climate as being made up of four constructs that address different levels of the school environment such as administration and support staff, teachers, students, and parents and community. The four constructs measured by this construct include: Collegial Leadership, Teacher

Professionalism, Academic Press, Community Engagement. In order to best organize the research evidence supporting the currently proposed model, findings related to each of the four constructs within the School Climate Index will be discussed separately.

*Collegial leadership* has to do with administrative organization and support, whether administrators are egalitarian, take teachers' opinions into consideration, and communicate expectations effectively. One study on beginning teacher self-efficacy tied teachers' levels of self-efficacy during their first year of teaching to the support they perceive from administrators and colleagues (Hoy & Spero, 2005). Additionally, Skaalvik and Skaalvik (2010) found that teachers' collective efficacy (school-level teacher efficacy) is strongly correlated to teachers' perceptions of, "having cognitive and emotional support from the school leadership, that they could ask the school leadership for advice, and that their relation to the school leadership was one of mutual trust and respect" (p. 1065). Tschannen-Moran (2009) related principals' style of leadership to teacher professionalism and found that teachers whose principals were trusting and supportive of their teachers (involved them in decision-making, respected their opinions) tended to produce higher levels of teacher professionalism.

*Teacher Professionalism* can be defined as characterized by teachers' engagement in their profession (with students as well as curriculum), and professional interactions with colleagues. Current research on professional learning communities provides support for the importance of collegial interactions across members of the school community (teachers and administrators, and amongst teachers). Professional learning communities

(PLC) are networks of teachers who work together toward mutual learning objectives in a supportive environment (Hord, 1997). These collaborations often occur at the school or district level, but are occurring increasingly in the online world as well (Brook & Oliver, 2003), allowing teachers to gain perspective from colleagues across the world. Kruse, Louis, and Bryk (1994) identified five aspects of professional learning communities: 1) shared norms and values, 2) collective focus on student learning, 3) collaboration, 4) deprivatized practice, and 5) reflective dialogue.

Research on PLCs indicates that, "teachers in these environments tend to feel more effective, more positive, and more able to meet students' needs" (Wynne & Patall, 2009 in reference to findings from Hicks, 1997). Additionally, a multi-level investigation of urban elementary school environments found that schools characterized as having more characteristics of professional learning communities were characterized by greater levels of commitment to innovation and experimentation (Bryk, Camburn, & Louis, 1999).

*Academic Press* is the degree to which the school environment supports the quest for excellence in education across all contributing members of the school environment. Findings from a study in urban schools (Goddard, Sweetland & Hoy, 2000) indicated that high levels of academic emphasis were associated with positive gains in elementary student achievement in both mathematics and reading. Research on Academic Optimism at both the school and individual teacher level indicate that high levels of academic expectation are positively associated with student achievement (Hoy, Hoy et al. 2008)

Last, *Community Engagement* is characterized by the relationship of the school to the community, including the degree to which the school can rely on support from parents and community. For the purposes of this study, it is important to focus on two lines of research supporting the importance of community and parental engagement in schools. In one study examining the degree to which schools receive support from parents and the local community found that in schools with greater levels of community outreach and parental involvement, children's achievement outcomes are significantly greater (Sheldon, 2003). Additionally, research on Academic Optimism indicates a positive relationship between teachers' trust of parents as stakeholders in their children's success and student achievement.

***Other School Climate Research***

In another line of work on School Climate, Brand, Felner, Shim, Sietsinger, & Dumas (2003) relate school climate to student outcomes (academic, behavioral, and socio-emotional adjustment). The measure of school climate used in this research, while sharing some conceptual foundation with the instrument of Tschannen-Moran & Hoy (2001), varies in that the scales focus on aspects of the school context that may be more salient to students' experiences of the school environment, including teacher support, consistency and clarity of rules and expectations, student commitment/ achievement orientation, negative peer interactions, positive peer interactions, disciplinary harshness, student input in decision-making, instructional innovation, support for cultural pluralism, and safety problems. Given that teachers serving traditionally marginalized populations

tend to leave the profession at high rates, the cultural pluralism subscale from this research is of particular interest to the current study.

Results from this multi-year, multi-level study indicate that "better performance on achievement tests was found in schools in which students reported higher levels of the Student Commitment to Achievement dimension" (p. 585). Relatedly, other school climate dimensions were positively related to student self-efficacy and academic aspirations. Students' behavioral outcomes (including classroom aggression and substance abuse) were negatively associated with several school climate dimensions, such as negative and positive peer interactions, teacher support, and instructional innovation. Last, students' socio-emotional outcomes (including self-esteem and depression) were associated with several school climate dimensions, such as positive and negative peer interactions, teacher support, and instructional innovation (Brand et al, 2003).

In a follow-up study by this group of researchers (Brand, Felner, Seitsinger, Burns, & Bolton, 2008), the same school climate dimensions were measured through teacher report rather than student report and the results were compared, finding high consistency of teacher perceptions of school climate to students' perceptions across contexts in predicting student academic, behavioral, and socio-emotional outcomes. One sub-scale, Support for Cultural Pluralism, from this research is being utilized in the current study due to the high numbers of teacher attrition in schools serving large numbers of minority students. The findings for this study indicated that, "Higher levels

of Support for Cultural Pluralism were associated significantly with better academic, behavioral, and socio-emotional adjustment among minority students" (p. 529). This finding makes examining the relationship between Support for Cultural Pluralism as part of the overall investigation into school climate factors salient, as it may be useful to determine if there is also a relationship between support for cultural pluralism within schools and teachers' motivation and professional commitment.

School Climate as a construct has been positively associated with teacher self-efficacy. Early work on the construct by Hoy and Woolfolk (1993) found that teachers' self-efficacy was positively related to principal leadership and support as well as teachers' perceptions of working at a school that has a strong academic focus.

***Professional Development***

*Relating Teacher Self-efficacy to Professional Development.* Tschannen-Moran and McMaster's (2009) study on teaching efficacy and professional development (PD) examined teacher efficacy in relation to four types of PD for new instructional strategies related to reading. The researchers were interested in the relationship between type of PD and both teaching efficacy and implementation of the reading instruction presented. The types of PD examined in this study include: 1) Presentation of information, 2) information + modeling, 3) information + modeling + practice, and 4) information + modeling + practice + coaching. Researchers found that teachers participating in PD 4 (information, modeling, practice, and coaching feedback) had both the largest increases in self-efficacy, and the highest implementation of PD reading instructional methods.

Interestingly a large portion of teachers who participated in PD 3 (included a demonstration and a planning and practice session, with no follow-up coaching) demonstrated a decrease in their self-efficacy for reading instruction. These findings seem congruent with the work of Desimone, et al. (2002) because the PD 4 structure embodies the active professional development (opportunities for practice and planning with fellow teacher) with reform structure (coaches following up within teachers' classrooms) and focused on specific content (hand gestures for beginning literacy learning). Additionally, the PD 4 condition, because it occurred over more than one session and included additional contact time with teachers would support the findings of Boyle, et al. (2005) in regard to duration.

***Teacher Learning and Professional Development***

One of the characteristics of professional occupations is that they require that their members continue to learn and grow in order to keep up with innovations within their field. The profession of teaching is no exception. New research on every aspect of teaching from curriculum, to classroom management, to culturally relevant pedagogy is being produced at rates much faster than can be processed by any one individual. So how do teachers continue to learn about their profession? Furthermore, what support for this learning is most helpful for teachers?

One line of study on teacher learning has addressed it in terms of situated learning or situated cognition. According to Greeno, Collins & Resnick (1996), learning occurs within a specific context and is distributed between the individuals within those contexts

and their resources (artifacts such as books and other environmental resources). When individuals are novice members of a learning community (such as pre-service and novice teachers), they rely on the modeling of more experienced individuals, but as they gain understanding through authentic opportunities to practice the behaviors they observe, their role as teachers becomes more central to the learning community. One of the implications of adopting a situated learning perspective of teacher growth is that learning happens not only in formal contexts, but from all social interaction. Teachers may learn a great deal about their practice from conversations with another teacher in the hallway between classes reflecting on practice or from more formal professional development experiences. "Formal or informal learning communities among teachers can act as powerful mechanisms for teacher growth and development" (Desimone, 2009, p.182).

While informal learning may be essential in the growth of teachers within the profession, it is important to examine the role of more formal teacher learning opportunities in terms of teachers' changes in practice. In order to do that it is essential to examine the literature on both identifying types of professional development opportunities and the relative effectiveness of different methods and aspects of teacher professional development.

### *Characteristics of Effective Professional Development*

Traditional professional development activities have recently come under fire by researchers and practitioners alike. Many experts believe that short-term workshops and conferences do not provide teachers with enough time, information, support, or practice

to effect long-term positive changes to their teaching (Garet et al, 2001; Desmone et al, 2001, Boyle et al. 2005). As such, many researchers have become interested in finding out more about characteristics of PD opportunities that are effective in bringing about these positive changes.

In a longitudinal study by Garet, Porter, Desimone, Birman & Yoon (2001), six criteria were developed based on the existing body of literature on effective professional development. The characteristics are as follows: reform vs. traditional type, duration, collective participation, active learning, coherence, and content focus. *Reform* type PD as defined by Desimone et al. (2002, p.83) includes activities, "such as a study group, teacher network, mentoring relationship, committee or task force, internship, individual research project, or teacher research center, in contrast to a traditional workshop, course, or conference". *Duration* refers to the amount of contact time the teachers have working within the PD setting, and can be considered both in terms of length of a specific day of work, frequency of PD activities, and the time from the first PD meeting to the last dealing with a specific topic. *Collective participation* refers to groups of teachers working together (such as teams or schools). *Active learning* refers to opportunities for teachers to engage with the content or instruction. For example, receiving feedback on their lesson plans or being observed while teaching lessons implementing material learned from the PD experience. *Coherence* refers to, "the degree to which the activity promotes coherence in teachers' PD, by incorporating experiences that are consistent with teachers' goals, aligned with state standards and assessments, and encourage continuing

professional communication among teachers" (Garet et al, 2001, p.920). Last, *Content focus* refers to the degree to which the PD opportunity is directed at improving teachers pedagogical content or content knowledge and skills.

In a subsequent study by the same authors, these factors were explored in their relationship to teacher outcomes (Desimone, et al, 2001) for learning to teach students the use of technology. Active PD with reform structure and collective participation focused on specific content resulted in greater content and pedagogical content gains for teachers learning to use technology within their classrooms. In this study there was no significant effect for the duration of the PD experience.

*Duration* of PD activity has been found in other studies to have a significant impact on changing teaching practices. Boyle, et al (2005) found a strong association between teacher reports of longer-duration PD activities and changes in their teaching practices including planning, assessment, and instructional practices. It is encouraging that many of the suggestions on fostering self-determination within the workplace are supported by the literature on characteristics of effective PD.

***Relevant Findings***

One recent multi-level study by Goddard, Goddard, and Tschannen-Moran (2007) investigated the relationship between student achievement and teacher collaboration. Their results indicate that fourth-grade students have higher achievement in mathematics and reading when they attend schools characterized by higher levels of teacher

collaboration for school improvement. This finding provides some support for the current study's investigation into the relationship between School Climate and teachers' Self-Determination in that one might expect teachers' collaboration in learning could foster greater perceived relatedness and competence as teachers learn more effective methods of influencing student achievement outcomes.

Studies involving teachers working together over time to research their teaching practices (reform structure, collective and active participation, long duration) have reported positive outcomes associated with the practice when carried out individually or in groups. Sagor's (1991) report on Washington State's "Project LEARN" described an environment in which teachers come together to carry out collaborative action research, which is a research cycle designed to help practitioners collect information within the classroom and implement changes to it. Researchers found that teachers were pleased with the control they were given over their research topics and this led to greater motivation toward the task. They also reported that teachers provided each other with helpful suggestions and encouragement, and that successful teams seemed to inspire their less successful counterparts to further inquiry. Castle (2006) explored teacher professional growth experiences qualitatively, using hermeneutic interview techniques. The three teachers who took part in the study reported increased perceptions of autonomy and teaching efficacy as well as positive student outcomes.

***Teacher Background***

Up to this point the factors that have been discussed in relation to teacher motivation and professional commitment have related to teachers' experiences of their professional environment (e.g. school climate, professional development experiences). In the case of teachers, other factors that should be considered in building a model of motivation and professional commitment to teaching include teacher training and education and teachers' years of experience in the field.

*Teacher Experience.* Some teacher turnover is expected and even healthy. Just as in any profession, some teachers do not realize until they are immersed in a career and its expectations that this is not the right path for them. However, teacher turnover is happening at greater rates than what can be expected by healthy rates of turnover (Borman & Dowling, 2008). Many teachers who choose to leave do so early in their careers. As reported earlier, between one-third and one-half of teachers choose to leave the profession within their first five years in the field (Archer, 1999, Ingersol & Smith, 2003). Nine percent of new teachers do not complete their first year (Black, 2001) and 14% leave after their first year (Ingersoll, 2002).

It may be useful to consider the reasons teachers give for leaving through the lens of Self-Determination Theory. According to research on attrition (Certo & Fox, 2002; Ingersoll, 2001) teachers who leave report that they received inadequate support from the school administration. If teachers do not feel that they can trust their administrators to support them in learning the requirements of the teaching position, they may not feel that they can seek help and guidance that would help them build competence. Additionally,

when novice teachers do not feel welcome into the school environment by their administrators or their teams (helping build strong teacher teams is part of the principal's purview), beginning teachers tend to feel isolated (Ingersol, 2001) and their needs for relatedness may not be adequately met. One of the most common concerns teachers report having to do with principal leadership is the lack of decision-making power they are given within their classrooms (Chin 2007; Tschannen-Moran 2009; Beard, Hoy et al. 2010). This concern is particularly salient to teachers' autonomy needs being met by their environment.

Two other related issues teachers report are: not knowing how to appropriately deal with student discipline problems and inadequate or unhelpful development opportunities. Both of these concerns heavily influence teachers' ability to meet their need for competence. Without the appropriate resources to grow, teachers may become frustrated and either choose to leave or stagnate in their growth, leading to loss of job satisfaction and burnout (Burke, Greenglass et al. 1996; Chang 2009; Grayson and Alvarez 2008).

*Teacher Education and Training.* Many different avenues exist for teachers to enter the field. The most traditional method of teacher education is through the four-year university. Many colleges and universities have campus-based teacher training programs in which teachers either gain teacher education and training while procuring their four-year baccalaureate degree or continue on for a masters degree. Additionally, some colleges have training programs for individuals who have already obtained their baccalaureate degree. Less traditional methods of teacher training include post-

baccalaureate alternative certification programs, which vary in length and field experience.

States designate the requirements for both university-based teacher certification programs and alternative certification programs. Currently all but two states have sanctioned some form of alternative teacher certification programs (Borman and Dowling 2008). It is because of this growing prevalence of alternative certification programs that researchers have turned their attention to differences between teachers who come from more traditional paths to teachers certified by alternative programs.

Less traditional methods of teacher training include post-baccalaureate alternative certification programs, which vary in length and field experience. In terms of teacher attrition as it is related to these various teacher certification programs, the results are inconclusive, but seem to point toward there being greater differences within alternative certification programs than between traditional and alternative programs in terms of teacher attrition. Because of these mixed results, the current study asks both for the type of teacher certification (if any) that the teacher has received as well as the teachers' perception of the nature of their field experiences (if any) from their training program.

### *Next steps in Research on Teacher Self-Determination*

Previous research has looked at many aspects of teacher background and context in relationship to teacher motivational variables and teachers' career decisions. The most closely related study to date (Vaughan, 2005) used hierarchical linear modeling to

examine the relationship of level of positive relationships with peers, and school ratings (school level), as well as teacher educational background, experience, gender, and teachers' motivational orientation (individual level) as predictors of self-determination (school and individual level, which in turn predicted teachers' professional commitment (individual level). While the general findings of Vaughan's study were reported earlier in the context of self-determination research support of using the construct with teachers, some of the non-significant relationships from the study are of particular importance to the design of the model from the current study. Findings from Vaughan's study that were relevant to the current research included: 1) The non-significant relationship of teacher gender to self-determination. Because of this non-significant relationship this measure has not been included in the current study. 2) Vaughan found that once teachers' level of experience was taken into account, teachers' motivational orientations (autonomous, controlled, impersonal) were no longer a significant predictor of self-determination. Because of this finding, data on teacher motivational orientation will be collected, although it is not included in the initial model. 3) Although some studies of teacher motivation and professional commitment have focused solely on its relationship to teacher attrition, Vaughan's (2005) findings indicate a significant relationship of teacher self-determination to all three aspects of teacher professional commitment (long-term career planning, active school participation, and on-going voluntary PD). It may be important to recognize the distinction between Vaughan's use of the "levels of positive administrator and teacher relationships" items and the use of School Climate construct in the current study. School Climate is a broader construct and refers to the nature of

relationships within the school in terms of both teacher and administrator behaviors and organizational structure and attitudes.

Finally, Vaughan (2005) included teachers' decision to participate in voluntary professional development opportunities in her measure of professional commitment as an outcome measure; however it is likely that teachers' opportunities for learning comprise a potentially important influence on both their self-determination levels and professional commitment. First, opportunities for learning and professional growth may be positively associated with teachers' striving for competence. Many modern PD activities involve teachers collaborating toward common goals that they have chosen for their learning. This environment may be particularly supportive of teachers' relatedness and autonomy needs. Second, in terms of professional commitment, having positive PD opportunities in one's past experiences may positively influence teachers' decisions to participate in PD opportunities voluntarily in the future. It is to this end that the existing body of research on PD experiences (e.g. (Garet, Porter et al. 2001; Desimone, Porter et al. 2002; Desimone 2009) has been utilized to construct a measure of teachers' PD experiences and attitudes.

***Summary***

Research on teacher attrition, job satisfaction, burnout, and motivation seem to be reporting similar findings in regards to school environments and teachers' needs for healthy work contexts and adequate support (Bogler & Somech, 2004; Cameron & Rupp, 2005; Klassen, Usher et al., 2010; Skaalvik & Skaalvik, 2010; Stockard & Lehman, 2004;

Tschannen-Moran 2009; Tschannen-Moran & McMaster, 2009). Given these findings, it is important to investigate the extent to which teachers' personal and contextual characteristics influence their motivational well-being and desire to remain in and contribute to the field. To that end, the current study attempts to measure and test a hypothesized model of the influences of teachers' educational and experiential background, school climate, and professional development opportunities on their perceptions of self-determination as well as professional commitment, and the possibility of a mediating role of self-determination between teacher background and contextual characteristics and professional commitment.

Significant findings in this study could serve dual purposes in terms of future research. First, if the relationships within the proposed model are found to be significant, it may be useful to look at possible moderating effects of teacher background characteristics such as years of experience and educational setting on the relationships within the model, illuminating the complex nature of interactions within the educational environment. Second, if Self-Determination is found to be a mediating variable in the effects of school climate and professional development experiences on teachers' Professional Commitment, further research examining ways to increase teacher Self-Determination through interventions in teacher Professional Development and health of School Climate may be warranted. By better understanding the complexity of relationships between school and teacher characteristics, it is hoped that policy-makers

and administrators can begin to provide appropriate support for teachers' well-being and more teachers will choose to remain and grow within their chosen profession.

# Chapter III: Methodology

The current study made use of survey data from two samples of teachers (charter school sample and traditional school convenience sample) and used structural equation modeling to conduct a multiple group analysis testing direct and indirect effects of teacher background and contextual variables on teachers' motivation and professional

commitment. This chapter describes the methods that were be utilized for the analysis including research design, data sources and samples, procedures, measures, data analysis plan, and techniques employed to ensure robust results.

### *Research Design*

A non-experimental convenience sample survey design was utilized. Although cross-sectional survey design is generally used to study associations that occur naturally between predictor and criterion variables, efforts have been made to ensure that the data collected represented the overall teaching population as best as possible given the convenience nature of the sample.

### *Data Sources and Samples*

The current study utilized data collected online from two samples of teachers utilizing Qualtrics survey software. The first sample was a by-product of an on-going study at the University of Texas at Austin. The purpose of the over-arching study from which these data were collected was to build a model of the characteristics of a unique group of charter schools (as they are not typical of either traditional public schools or other charter schools in general). These schools a group of academically successful Science, Technology, Engineering, and Mathematics (STEM) schools in a southern state run by a non-profit organization begun by educators and university academics. The first of these charter schools opened just over a decade ago and there are now 33 campuses throughout the state with 1,482 faculty and staff serving over 16,000 students. The campuses are often located in communities of traditionally underserved student populations and many of the campuses are Title I Schools, however the majority of these

schools are recognized by their state for academic excellence, pointing to the importance of further studying the operations, climate, and policy of these schools.

Since these schools are public charter schools, parents who wish their students to attend apply to the school and students are allowed into open slots based on a lottery system. Given the enormous growth of the Charter School System, many new teachers are hired each year. Many of the teachers entering the schools are in their first years of teaching. This is because the administrators of the charter school system hope that by hiring inexperienced teachers, the culture of the school will be adopted by the novice recruits. This practice of hiring teachers directly from schools and training programs means that their teaching population is significantly younger than the overall teaching population.

A few unique elements of the charter schools are as follows. First, most teachers in these schools teach at multiple levels. That is, high school teachers also teach middle school in the schools where both ages are present. Likewise, in elementary/middle schools, teachers often teach both age groups. Many of the schools are small, with only two or three classes of students at each grade level. In addition to the strong focus on math and science, foreign languages are offered from a younger age than the typical public schools in the same state. The school system advertises their commitment to preparing each student for college by providing a safe, caring, learner-centered environment where students, teachers, and parents collaborate to provide a program with a strong emphasis on science, technology, engineering, and mathematics.

All school teachers in the charter school system (approximately 1,350) throughout the state were invited to participate in the study; however, only 16 schools were sampled at the time of the data analysis for the current study. These 16 schools represented teachers at every level, K-12 (see Figure 7 in Appendix B). The Teacher Survey includes the measures utilized in the current study as well as some questions aimed at investigating the unique instruction and management techniques practiced in the Charter School environment. A total of 257 completed surveys from the charter schools' teachers were utilized in the Structural Equation Modeling Analyses for the current study.

In addition to the Charter School teachers, data were collected from a convenience sample of 399 public school teachers throughout the country, with 258 completed surveys utilized in the SEM analyses. Sources of public school teachers included a list of personal teaching contacts from time the researcher spent training and practicing as a K-12 classroom teacher as well as posting requests for teachers from social networking sites and list-serves. Additionally, teachers who chose to take the online survey were asked to send the survey to two teachers they knew who teach different subjects and/or different grade levels of students in order to reach as broad of a range of teachers' experiences as possible. Efforts were made to recruit teachers from a variety of settings as well, including rural, suburban, urban, and inner-city schools. Teachers from the public school sample taught all grades sampled (see figure 7 in appendix B) and were significantly more diverse in terms of age and experience than their charter school counterparts.

The Qualtrics survey program allows for anonymous collection of data through a general link that can be pasted into a contact email, list-serve post, or social networking site along with relevant study information allowing the recipient to learn about the study and make an informed decision about participation. Because of the anonymous nature of the survey distribution, the researcher was not able to differentiate between those contacted who had participated or had not participated. Therefore, any reminders acknowledged and thanked the contacts who had already responded.

***Measures***

*Professional Commitment.* The measure of professional commitment was conceptualized as a multifaceted construct. The construct contains six closed-ended, Likert-type items and measured long-term career planning, on-going professional development pursuits, and voluntary participation with student groups. Long-term career planning was measured by asking teachers the extent to which they agreed or disagreed with the statement, "I plan to stay in the teaching profession until I retire." Teachers chose between five levels ranging from "strongly disagree" to "strongly agree."

On-going professional development pursuits were measured by asking teachers to describe their usual involvement in continuing education courses ranging from participating only when required (scored a 1), to participating in three or more courses per year (scored a 4). Teachers' current and future pursuits toward university-based education were measured using responses to the statements, "I am currently pursuing or have a graduate level degree" (5) "I plan to pursue a graduate level degree" (4), "I am currently taking university courses that interest me but are not part of a degree plan" (3),

“I plan to take university courses that interest me but are not part of a degree plan” (2), “I do not intend to pursue additional university-based education at this time” (1).

Active school participation with student groups was measured with three questions asking teachers for their previous, current, and future involvement with voluntary student groups. Item responses were yes/no, with previous and current experiences rating a 2 for a yes response and 0 for a no response. Future involvement was scored 1 for a yes responses and -1 for a no response. Teachers who had previously volunteered, were currently volunteering, and planned to volunteer in the future received a score of 5. Alternately, teachers who had never volunteered and had no future plans for volunteering received a score of -1.

The overall Professional Commitment score was then computed by adding the scores from the three components, with each component being assumed to be equally important to teachers’ professional commitment. This scale was developed and used in previous research by Vaughan (2005). The item measuring teachers’ university-based continuing education was not utilized in the final analysis of this research due to inconsistencies in teacher responses across several scales that asked about degrees obtained. Given that this was the only item that asked for degrees obtained, this was not expected to be an issue. However, the remaining items were included and found to be significantly related to teacher self-determination both at the school level and the individual level (Vaughan, 2005). The proportion of total variance in professional commitment explained by self-determination was 11.8%. Furthermore, a significant relationship also existed between self-determination and each of the components of

professional commitment with 8.72% of the variance explained by teachers' long-term career planning, 1.86% explained by teachers' continuing education, and 4.51% explained by teachers' voluntary active participation with student groups.

*Teacher Self-Determination.* For the purposes of this study, Self-Determination was measured by a modification by Vaughan (2005) of the "Basic Psychological Needs Scale" developed by Deci & Ryan (2001). The scale contains three sub-scales, measuring the constructs of perceived autonomy (3 items), competence (4 items), and relatedness (3 items). Each item in this scale is measured using Likert-type items in a five-point format ranging from "not at all true" to "very true". The total score for this scale is computed by summing responses on items for each subscale with higher scores representing higher levels of self-determination. Vaughan's 2005 study reported for these data Cronbach alphas of .81 for autonomy, .73 for competence, and .64 for relatedness. The total scale alpha level was .78. Previous alpha levels reported for these constructs by Deci & Ryan (2001) were .79 (autonomy), .73 (competence), and .84 (relatedness). Vaughan explained the lower reliability of the relatedness construct in her study as being possibly related to the social desirability of the item, "When I'm not in class teaching, I like to spend time with the other teachers", believing that teachers often do not have the extra time to spend their planning periods with other teachers. Individual items for this scale are included in Appendix A.

*School Climate.* Four of the five sub-scales measuring school climate for the purposes of this study were taken from the work of Hoy, Hannum, & Tschannen-Moran (1998) and DiPaola, & Tschannen-Moran (2001). The four aspects of school climate

measured by this construct include: Collegial Leadership (7 items), Teacher Professionalism (8 items), Academic Press (6 items), Community Engagement (7 items). The total scale has 28 closed-ended items with 5 point Likert-type scale responses ranging from “never” to “very frequently”. Scores for the four subscales are computed by taking a mean of the items for each. While these scales have been normed based on previous research utilizing the constructs, and scores may be compared across schools, this is not desired for the purposes of the current study. Instead, a composite score was obtained by adding the means of scale scores and both the total scale score and the subscales were examined in relationship to teacher self-determination and professional commitment.

Previous research utilizing the scale (DiPaola & Tschannen-Moran, 2005) has produced Cronbach alpha levels of .96 for the overall scale, and the following values for each sub-scale: Academic Press .92, Collegial Leadership .93, Teacher Professionalism .94, and Community Engagement .93. While the School Climate Index has been related to teachers’ self-efficacy as well as student achievement outcomes, it has not been investigated in relation to either teacher self-determination or professional commitment.

The last sub-scale used to measure school climate in this study was the Teacher version of the Inventory of School Climate developed by Brand, Felner, et al. (2008). The subscale being used for the present study is a measure of Support for Cultural Pluralism in Schools. This sub-scale consisted of 5 closed-ended items with Likert-type responses ranging from “never” to “very frequently”. Support for Cultural Pluralism has

been positively associated with student achievement, but has not been investigated in relation to teacher outcomes.

*Teacher Professional Development Experiences.* This scale was created for the purposes of this study based on research on effective professional development (Desimone, 2006; Desimone, 2009; Desimone, Porter et al., 2002; Garet, Porter et al., 2001) to measure the extent to which teachers have experienced professional development opportunities that are supported by research on effective professional development. These effective characteristics of professional development include: duration, active learning, collective participation, coherence, and content focus (Garet, Porter, et al., 2001). The measure asked teachers about their experiences with these effective characteristics across a variety of settings, including: in-district workshops and institutes; out-of-district workshops and institutes and/or conferences; teacher study groups, collaboratives and networks; working with a mentor, coach, lead teacher and/or observer; and utilizing teacher resource centers. These settings were modified from an earlier measure of teachers' professional development experiences created by Garet et al. (1999); however, the purpose of that study was to look at a single professional development experience rather than several experiences over time.

For each setting listed above, the characteristics of effective professional development were assessed using a variety of questions. Part A for each setting asked questions about frequency and duration of the PD activities. Part B asked questions directed at the active and collaborative qualities of the professional development, including teachers' perceptions of opportunities for practice, receiving feedback, and

sharing of teacher/student work, getting at collective participation and active involvement. Items for this section were measured using a 5 point Likert-type scale ranging from “never” to “always”. Part C asked about teachers’ perceptions that their knowledge and skills were enhanced in specific content areas, getting at content focus, and Part D asked about teachers’ perceptions of the usefulness and consistency of professional development activities, getting at the construct of coherence. Items in parts C and D were measured using a 5 point Likert-type scale ranging from “not at all” to “to a great extent”.

Because any of the professional development settings could, in theory, contain any or all of the characteristics of professional development, each setting’s scores were assumed to be of equal value. Because different parts (A-E) had different numbers of items, scores for each section were added across contexts and averaged based on the professional development experiences of each teacher. However, one unique feature of this scale as administered online using Qualtrics was that if teachers responded “never” in Part A, Question 1, “How frequently have you had the opportunity to participate in this type of professional development activity?”, they were automatically moved forward to Question 1 for the second setting. For example, if teachers had never participated in professional development activities where they formed study groups or collaboratives, they were skipped forward to answer the same set of questions about working with mentors, coaches, or observers. The full scale is available below in Appendix A, with items mapped to the characteristics of effective professional development mapped above.

*Motivational Orientation.* This scale measured teachers' individual orientation toward being autonomous, controlled, and impersonal in different domains. The scale that was included as part of the survey was Vaughan's (2005) adaptation of Deci and Ryan's (1985b) General Causality Orientations Scale. Seven of the 12 original vignettes were retained by Vaughan and slightly adapted to fit the teaching context. Vaughan's findings indicate Cronbach alphas of .68 of autonomous, .55 for controlled, and .67 for impersonal. The original values from the research of Deci and Ryan (1985b) were .74 for autonomous, .69 for controlled, and .74 for impersonal. Additionally, the total variance in self-determination explained by the model in Vaughan's study by motivational orientation was 5.95%, although this explained variance was not significant once teacher's years experience were entered into the model. The full items are available below in Appendix A. This construct was not included in the initial model based on the finding of Vaughan (2005) that indicated it did not contribute significantly to the model once teachers' years experienced were included, and was not found to be necessary to include in the final model to produce adequate fit of the data to the model.

*Teacher Background and Education.* This section was comprised of three questions that targeted teachers' years of teaching experience, method of obtaining certification (if any), and amount of pre-service teaching or internship experience received prior to taking their first

classroom teaching position. Categories for years of teaching experience included 0-2, 3-5, 6-10, 11-20, and 21+ years. Type of certification allowed for three possible answer choices, which were coded for analysis: four or five year university-based

program (2), alternative certification programs (e.g. - university deficiency programs, district programs, etc.) (1), and, "I have not received a teaching certificate at this time" (0). Last, items asking about student teaching or internship experience allowed for four choices ranging from "I did not receive any student teaching and/or internship experience" (scored 1) to "I received extensive student teaching and/or internship experience" (scored 4). In Vaughan's (2005) study, years experience was a significant predictor of self-determination, after controlling for other predictor variables. Full items for teacher background and education variables can be found in Appendix A.

*Socio-Demographic variables.* Instrumentation for the study included the following demographic variables: School Sector – public, private, charter, etc. (drop-down menu), grade levels taught (radio buttons – may choose multiple), subjects taught (radio buttons – may choose multiple), state or province (fill in the blank), most accurate descriptor of school's location (rural, suburban, urban, inner city – drop down menu), school district (fill in the blank – optional), sex (M/F – radio button), ethnicity (fill in the blank), and age (fill in the blank). These data served as indicators of the make-up of the sample only, and were not included in the model.

***Hypotheses***

1) Teacher background characteristics (experience and education) will significantly positively relate to teachers' perceptions of self-determination and professional commitment in the model.

2) School Climate health, as perceived by teachers, will significantly positively relate to teachers' perceptions of self-determination and professional commitment in the model.
3) Teachers' professional development experiences will significantly positively relate to teachers' perceptions of self-determination and professional commitment in the model.
4) Teachers' perceptions of self-determination will significantly positively predict professional commitment in the model.
5) Self-determination will serve as a significant mediator of the positive relationship between teacher background and contextual influences (teacher background, school climate, and professional development experiences) and professional commitment.
6) There exists no significant difference in the factor loadings of the measured variables on the latent variables in the model for traditional public school teachers as compared to charter school teachers.
7) There exists no significant difference in the relationships between latent variables in the model for traditional public school teachers as compared to charter school teachers.

***Data Analysis***

The variables measured as a part of this study, including teacher self-determination, teacher professional commitment, school climate, and professional

development experiences are latent constructs that cannot be measured directly (Keith, 2006). Using Structural Equation Modeling to make multiple group comparisons of latent mean differences allows for more appropriate corrections for measurement error because mean differences (latent) are corrected for error. This allows for a more accurate result than if other methods were used to examine group mean differences on the constructs (Hong, et al., 2003). Therefore, for the purposes of this study, a Latent Means Analysis (LMA) using a multi-group structural equation modeling (SEM) approach was utilized. The statistical programs PASW version 18, and Mplus were employed to carry out the analyses.

*Sample Size.* Structural Equation Modeling generally requires large samples. The analysis of complex models requires larger samples than simpler models because of the ratio of the number of parameters to be estimated to the sample size. If each item in a scale were to be considered its own unique parameter for the basis of analysis in this study, very large sample sizes would be required. However, researchers utilizing SEM simplify models by using parameters, which are scores computed for sets of homogeneous items (Kline, 2005). For the purposes of model building, the items associated with each subscale were grouped together as parameters. While some sources recommend a minimum 100 or 200 participants in order to build structural equation models (Kline, 2005), in this case the number of participants was calculated by totaling parameters and paths within the model and then multiplying that number by 5, as a rule of thumb (Whittaker, 2010, course communication). In this case, the number of

parameters and paths was 35, meaning that a minimum sample size of 175 was needed for adequate power.

*Diagnosing Data Problems.* Preliminary analysis and clean-up of the data was primarily visual. For the two samples, a total of 743 responses were recorded in Qualtrics. However, once removing those responses for which individuals either 1) marked that they were not currently teachers, 2) where individuals agreed to participate, but then did not respond to at least one item, or 3) after beginning the survey chose the same response (all fives, for example), the number of valid responses decreased to 620. The second step of checking for outliers for this study was done utilizing PASW 18, graduate statistics package. For each scale, possible outliers were investigated utilizing the explore function under descriptive statistics, which contains a function to help detect outliers. Outliers were explored with the aid of histograms and box plots, as well as the descriptives table and the extreme values table, which provides an indication of the degree to which outliers are having an influence on the mean. Outliers were removed in two ways. If a case showed up as an outlier on more than one scale the entire case was removed. Only 12 Public School cases were removed, and 4 Charter School Cases, bringing the total responses down to 604. If a case contained an extreme outlier on one sub-scale only that sub-scale score was removed. This was only done for one sub-scale each for 7 cases, as these cases were having a significant effect on the mean of sub-scale scores. Actual sample size varied by analysis due to incomplete data sets, but the SEM analysis was completed with contributions from 256 public school and 255 charter school teachers.

*Measurement Model.* Structural Equation Modeling procedures can be separated into two types of modeling, measurement models and structural models (although these two types of models are separate only in theory as they are run simultaneously in during data analysis). The measurement model is specified using the correlation matrix of all of the sub-scales from the data and utilizing Confirmatory Factor Analysis (CFA) techniques. CFA is a multivariate statistical procedure that is used to test how well the measured variables represent pre-determined constructs. CFA is multipurpose in the analysis because it both tests the fit of the predicted model and establishes scale validity (Keith, 2006). Relevant theory was used to propose a model for each measure used in the current study and the purpose of using CFA was to test the fit of the measures to that model.

*Structural Model.* The structural model represents the relationship of the latent variables to one another and also uses the correlation matrices (see Appendix B). The latent variables are "optimally weighted combinations of the measured variables" (Keith, 2006), which are represented by rectangles in the model. Each measured variable has an associated error that represents the unique and error variance associated with it. Additionally, each endogenous latent variable has an associated residual or disturbance term pointing to it that represents all of the remaining influences on the latent variable other than the measured variables pointing to it. The paths represent both the direction of the relationship and the explained variance associated with the relationship of the predictor or mediating variable on the outcome variable.

While it is helpful to think about the measurement and structural models separately, in the SEM analysis, the two models are actually tested simultaneously in the Mplus program. The initial structural equation model is drawn in Figure 2 below. Labels for the measured variables (subscales) and the unique error associated with each of these measured variables have been left off due to space constraints, but subscales are outline above in the measures section and in the Glossary.

*Assessing fit.* In the analysis of the data, the correlation matrix of the sub-scales for each measure were used to estimate the model. Goodness of fit is the degree to which the observed input correlation matrix is predicted by the estimated model. The chi-square statistic tests the absolute fit of the model to the data. A non-significant result is desired for goodness of fit, but because the statistic is dependent on degrees of freedom and sample size, large sample sizes increase the likelihood of obtaining significant results, even when the model fit is good. This is why other fit indices are commonly used to assess model fit. The large sample sizes in this study make other indices more appropriate measures of fit for the model.

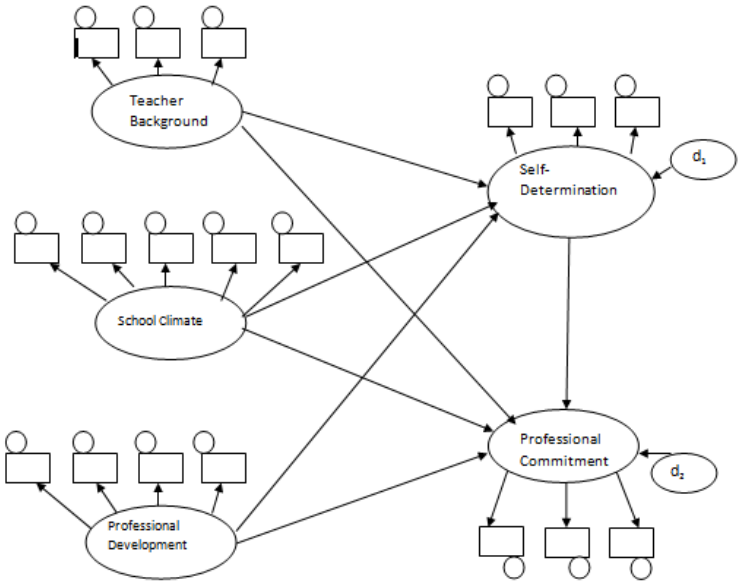


Figure 2: Initial model of the influence of teacher background and contextual characteristics on teacher's self-determination and professional commitment.

For the purposes of this study, the following fit statistics were utilized: $X^2$, the Comparative Fit Index (CFI), Tucker Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean-Square Residual (SRMR) (Gibbs, Giever, & Higgins, 2003). Browne and Cudeck recommended that "a value of the RMSEA of about 0.05 or less would indicate a close fit of the model in relation to the degrees of freedom," and that "the value of about 0.08 or less for the RMSEA would indicate a reasonable error of approximation and would not want to employ a model with a RMSEA greater than 0.1", (1993, p. 144). Values of the SRMR less than .10 are generally considered favorable (Kline, 2005). A rule of thumb for the CFI and other incremental indexes is that values greater than roughly .90 may indicate reasonably good fit of the researcher's model (Hu & Bentler, 1999). They also recommend joint criteria for assessing model fit. For example, utilizing both the SRMR at values less than .10 and

the CFI at values > 0.9 may minimize the likelihood of either rejecting a model with good fit or accepting one with poor fit.

Many of the scales involved in this study have been utilized in previous studies with K-12 teacher populations, and so it is was expected that for these scales, the associated subscales would fit the CFA fairly well; however the Professional Development Experiences and the scale had no previous reported reliability data associated.

*Multiple Group Analysis.* Up to this point, the analysis described has looked at the general model of all teachers involved in the study (both traditional public school and charter school teachers). Multiple group analysis involves running a model in which the parameters of interest are constrained to be equal across groups and then compare the fit of that model to one in which the parameters are free to vary across groups. Traditional public school teachers were used as the reference group in this analysis. The means of the latent constructs for this group were set to zero so that the mean estimates for the charter school teachers would indicate the relative differences from the traditional public school teachers (Keith, 2006).

*Measurement invariance*. For the purposes of this study, strict factorial invariance criteria were utilized for the comparison of teacher groups, meaning that the model conformed to the requirements of, "equality of factor loadings, intercepts, and residual variances across subpopulations" (Lubke & Muthen, 2005, p.27). Since the multi-group purpose of the current study was simply to determine whether models were equivalent for the two teacher groups, allowing for a general model of the relationship

between teacher background and contextual factors to teacher self-determination and professional commitment, further exploration of differences between the two groups are only discussed as an aid to interpret the resulting models.

# Chapter IV: Results

***Participant Demographic Results***

Online data collection for this study resulted in a total of 344 partial data sets from public school teachers, and 388 partial data sets from charter school teachers. Because public school teachers were recruited via chat boards, listservs, and personal contacts, there was no way of knowing the number of teachers invited to participate. Of the 33 charter schools in the system, 17 were invited at the time of this study, resulting in approximately 820 teachers invited to participate. Demographic data reports for this study are based on all partial responses that included the demographic questions of interest. Table 1 illustrates self-report demographic results of teacher-level variables, illustrating significant differences between the two samples, as well as combined data.

Public school teachers in this study were significantly older and had more experience in the field. This finding corresponds to the report from charter school administrators that it is common practice at the schools to hire teachers new to the field.

Although women tend to dominate the field of education, public school teachers in this study were significantly more likely to be women than their charter school teacher counterparts. One possible reason for this may be the STEM focus of the charter schools. Public school teachers in this sample were also more likely to be white. The charter school teachers identified as belonging to ethnic minority groups in higher percentages for every ethnicity surveyed. For this particular demographic, teachers were instructed to choose all ethnic groups with which they identified.

Teachers were also asked to report on the demographics of their schools, including whether the schools qualified as Title I campuses, met No Child Left Behind (NCLB) Adequate Yearly Progress (AYP) minimum standards, the percent of minority students attending their school, and the school's location. Significant differences existed in school location, with public school teachers working in rural and small town schools more frequently and charter school teachers working in urban or inner city schools more frequently. Both populations had similar percentages of teachers working in suburban schools (Public = 29.9%, Charter = 30.9%). There also existed significant differences between public and charter school teachers' reports of percentages of minority students in the schools in which they work, with higher percentages of ethnic minority students in charter schools (see Table 2).

While there was no significant difference between groups in reports of working in Title 1 schools, charter school teachers were significantly more likely to report that their school currently meets the minimum requirements for NCLB's AYP standards. In terms of responses on the scales in the study, charter school teachers reported significantly

more positive experiences of school climate (on all sub-scales), higher self-determination, and more positive experiences with professional development (except in terms of duration). However, there was no significant difference between groups in terms of professional commitment. For further information on differences between public and charter school samples on the measures in this study, please see Appendix B, tables 9-12.

| **Teacher Variables** | **Public** | **Charter** | **Combined** |
|---|---|---|---|
| Age** | N=227<br>Mean (SD) = 42.1 (11.9) | N=214<br>Mean (SD)= 30.5 (6.0) | N=441<br>Mean (SD) =36.5 (11.1) |
| Sex ** | N=259<br>M = 32 (10.5%)<br>F = 227 (74.7%) | N=286<br>M = 92 (30.6%)<br>F = 194 (64.5%) | N=545<br>M = 124 (20.5%)<br>F = 421 (69.6%) |
| Years Experience** | N = 250<br>Mean (SD) = 13.8 (9.4) | N=252<br>Mean (SD) = 4.1 (3.5) | N=502<br>Mean (SD) = 8.9 (8.6) |
| **Teacher Ethnicity Data** | Frequency (%) | Frequency (%) | Frequency (%) |
| American Indian/ Alaska Native | 4 (1.3%) | 6 (2%) | 10 (1.7%) |
| Asian | 2 (.7%) | 28 (9.3%) | 30 (5.0%) |
| Black/ African American | 5 (1.6%) | 11 (3.7%) | 16 (2.6%) |
| Hispanic/ Latino | 15 (4.9%) | 36 (12 %) | 51(8.4%) |
| Native Hawaiian / Pacific Islander | 0 (0%) | 2 (.7%) | 2 (.3%) |
| White | 236 (77.6%) | 209 (69.4%) | 443 (73.6%) |

| | | | |
|---|---|---|---|
| Other | 1(.3%) | 3 (2.1%) | 9 (1.2%) |

Table 1. *Teachers' reports of teacher-level demographic data.*
***=Significant at the .001 level*

| **School Variables** | **Public** | **Charter** | **Combined** |
|---|---|---|---|
| | Frequency (%) | Frequency (%) | Frequency (%) |
| **Ethnic Diversity (school) **** | N= 258<br>Mean (SD) = 2.1 (.8) | N=283<br>Mean (SD) = 2.6 (.7) | N=541<br>Mean (SD) = 2.4 (.8) |
| 0-25% Minority | 77 (25.3%) | 25 (8.3%) | 102 (16.9%) |
| 25-50% Minority | 74 (24.3%) | 76 (25.2%) | 150 (24.8%) |
| >50% Minority | 107 (35.2%) | 182 (60.5 %) | 289 (47.8%) |
| **At Title I School** | 149 (46.7%) | 161 (53.5%) | 303 (50.1%) |
| **NCLB AYP Status Met **** | 199 (65.5%) | 263 (87.4%) | 462 (76.4%) |
| **School's Location **** | N=259<br>Mean (SD) = 2.8 (1.1) | N=287<br>Mean (SD) = 3.8 (.8) | N=546<br>Mean (SD) =3.29 (1.1) |
| Rural | 36 (11.8%) | 3 (1%) | 39 (6.4%) |
| Small Town | 65 (21.4%) | 6 (2%) | 71 (11.7%) |
| Suburban | 100 (32.9%) | 99 (32.9%) | 199 (32.9%) |
| Urban | 40 (13.2%) | 129 (42.9%) | 169 (27.9%) |
| Inner City | 18 (5.9%) | 50 (16.6%) | 68 (11.2%) |

Table 2: *Teachers' reports of school-level demographic data.*
***=Significant at the .001 level*

***Scale Results***

Scale reliability data for this study were calculated using Cronbach's alpha statistic, which is equivalent to the average of all possible split-half correlations.

| Variables and Measures Cronbach's α Values | Public School Teachers | Charter School Teachers | Combined |
|---|---|---|---|

Reported reliabilities were based on all partial and full responses that included the full scale data, therefore the number of teachers contributing to reliability calculations is slightly different between scales. For the purposes of contrast, both public and charter school teacher reliabilities have been included separately, as well as total sample reliability data.

| | | | |
|---|---|---|---|
| **Teacher Self-Determination** | | | |
| Autonomy | 0.90 | 0.92 | 0.91 |
| Relatedness | 0.81 | 0.73 | 0.78 |
| Competence | 0.77 | 0.86 | 0.81 |
| **School Climate** | | | |
| Collegial Leadership | 0.91 | 0.95 | 0.93 |
| Teacher Professionalism | 0.90 | 0.91 | 0.91 |
| Academic Press | 0.81 | 0.84 | 0.85 |
| Community Engagement | 0.87 | 0.92 | 0.90 |
| Support for Cultural Pluralism | 0.76 | 0.64 | 0.70 |
| School Safety | 0.68 | 0.77 | 0.75 |
| **Professional Development** | | | |
| Active/ Collective Participation | 0.87 | 0.95 | 0.95 |
| Content Focus | 0.89 | 0.97 | 0.97 |
| Coherence | 0.85 | 0.96 | 0.95 |

Table 3: *Reliability Data for Attitude Scales in Proposed Model*

***Model Fit Results***

In order to look at the fit of the overall model and to compare the fit of the model across groups (multiple group analysis), it is first necessary to test the fit of the measurement model, or the fit of the sub-scales on the measures in the model for the total sample and for each individual sample separately. Results for this test indicated that each sub-scale loaded significantly on its measure, although two sets of sub-scales from the Self-Determination measure also had significant loadings on the School Climate measure. The Autonomy and Relatedness sub-scales also contributed significantly to the School

Climate factors of Collegial Leadership and Teacher Professionalism respectively. The fit indices indicated that model fit might be improved if the error terms were allowed to co-vary for these two sets of sub-scales and upon examining them, it became clear that the items were sufficiently similar in content as to warrant the change to the measurement model. Both teacher autonomy and collegial leadership items ask about teachers' perceptions of administration, and both teacher relatedness and teacher professionalism ask about teachers' perceptions of relationships among teachers within the school, although both of these sets of sub-scales aim at slightly different aspects of these relationships. By allowing the error terms for these sub-scales to co-vary, the measurement model fit was improved (Byrne, 2001).

In the next phase of model analysis, the general structural model for the combined data was assessed. The initial fit for the model was adequate, but the fit indices pointed toward a relationship between School Climate and Professional Development Experiences within the model that had not previously been specified. By allowing these two measures within the model to co-vary, the model fit was improved (see Figure 3 for model modifications and Table 4 for fit Indices). This model was then tested for each of the samples individually, with adequate fit for the charter school model and excellent fit for the public school model.

The next step involved estimating a joint, yet unconstrained model (allowing coefficients to vary freely across groups). All factor loadings were the same, with some differences in the path coefficients, indicating differences in the magnitude of

relationships within the model between groups for both the measurement and structural models. See Table 4 for fit indices.

Last, a model was estimated where all parameters were constrained to be equal across groups. This model produced inadequate fit, indicating that there exist differences in the magnitude of the relationships between variables in the model across public and charter School teachers (see Table 4 for fit indices). The Chi-Square difference test allowed for a determination of whether there were significant differences between models. The test of the more constrained model with all parameters fixed and the joint model with paths allowed to vary freely resulted in a $X^2$ difference of 186.59, which is significant at the 0.01 level, indicating that the model where path coefficients were allowed to vary freely was a better fit for the two groups of teachers. Although the purpose of the current study is simply to determine whether the model provides an adequate fit for both groups, and the current analysis establishes this fit, further analysis would be needed to determine which relationships within the model varied significantly between the two samples of teachers.

| Fit Index | Criteria for acceptable fit | General Model | Public Schools Model | Charter Schools Model | Joint Model Free Parameters | Joint Model Fixed Parameters |
|---|---|---|---|---|---|---|
| CFI (Comparative Fit Index) | Values > 0.9 | 0.96 | 0.97 | 0.94 | 0.95 | 0.90 |
| TLI (Tucker Lewis Index) | Values > 0.9 | 0.95 | 0.96 | 0.92 | 0.94 | 0.90 |

| | | | | | | |
|---|---|---|---|---|---|---|
| RMSEA (Root Mean Square Error of Approximation) | Values < 0.08 | 0.06 | 0.04 | 0.08 | 0.06 | 0.08 |
| SRMR (Standardized Root Mean Square Residual) | Values < 0.10 | 0.06 | 0.06 | 0.08 | 0.07 | 0.17 |

Table 4: *Fit indices for combined and joint models.*

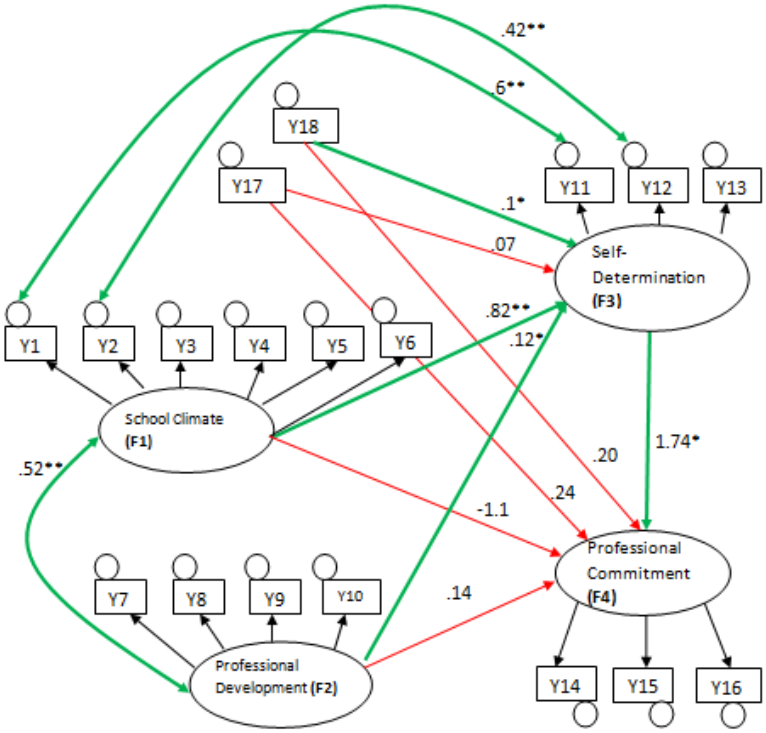


Figure 3: General Model with path coefficients specified.
**=Significant at the .05 level, **=Significant at the .001 level*

While the model fit was good for the above model, and the significant paths seem interpretable, the negative path coefficient evidenced in the path of F4 on F1 and the greater than 1 coefficient in the path of F4 on F3 indicate an issue with the data called a

Heywood case. To further explore what was going on, path coefficients were determined for public and charter school groups separately.

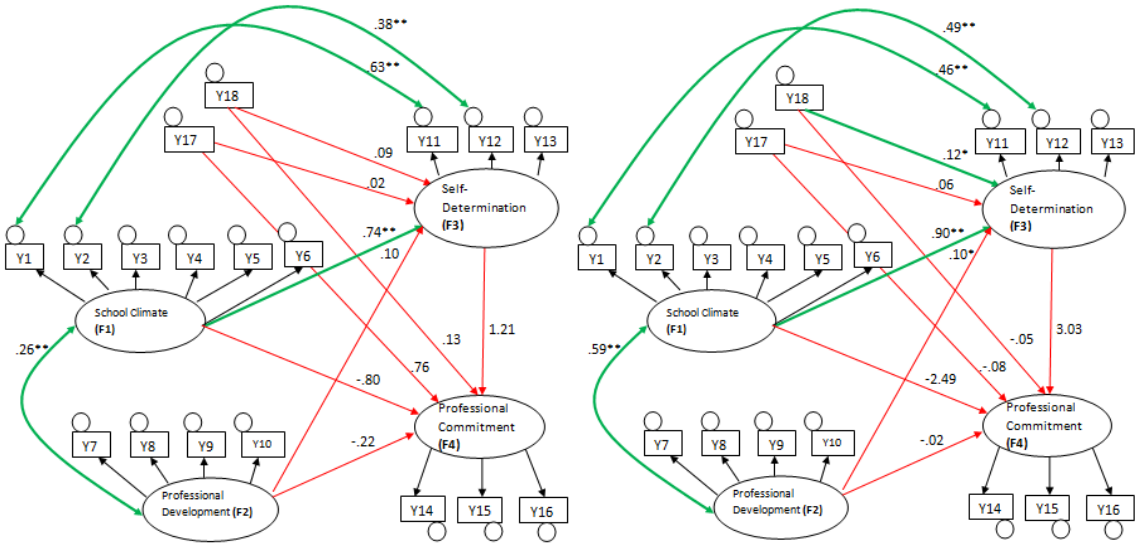


Figure 4: Public School (1) and Charter School (2) Models
**=Significant at the .05 level, **=Significant at the .001 level*

Note that the same data issue is occurring in both the public and charter school models as was seen in the general model. Several possible causes exist for such results. Chen, Bollen, Paxton, Curran, and Kirby (2001), list five such possibilities. 1) Sampling fluctuations, 2) model mis-specification, 3) under-identification, 4) empirical under-identification, and 5) outliers. Since sampling fluctuation is not something that I, as a researcher can retroactively control for, I choose to focus on the other causes of this type of result. Cause 3, under-identification, is not an issue, the model is over-identified (there are a greater number of unique correlations contributing to the model than parameters in need of estimation). Cause 5, outliers, may still be somewhat of an issue, but removing outliers (see description of process above) from the data set actually increased the

inappropriate estimates rather than decreasing them. Cause 4, empirical under-identification can occur when multicollinearity is present in the data. One way to test for multicollinearity is to compute the Variance Inflation Factor using SPSS. To do this, total scale scores must be calculated and the resulting correlation matrix is utilized to run a hierarchical linear regression. At this time, the data can be checked for multicollinearity. Values of the Variance Inflation Factor (VIF) that typically indicate issues with multicollinearity are greater than 10. For the data set, the VIF statistics were 1.8 for the public school data and 2.2 for the charter school data, indicating that multicollinearity is not a large issue in the data set. Another possible contributor to empirical under-identification is the inclusion of non-linear relationships in the model. The final cause Heywood cases, as discussed by Chen, et al. (2001) is model mis-specification, or including inappropriate (too many or too few) paths in the model. Below are the tests for an alternate model to fit the data.

Given that the paths from F4 to F1 and F2 were not significant in any of the above models, it seemed prudent to test a model where the direct paths from school climate and professional development experiences were removed, leaving only the indirect path through the mediating variable, self-determination. The change in the Chi-Square statistic from the previous model to the mediator model was non-significant at the .01 level, indicating that it is appropriate to adopt the more parsimonious model. Below are the fit indices for this mediator model as well as the path estimate diagram for the general model.

| Fit Index | Criteria for acceptable fit | General Model Mediated | Public Schools Mediated | Charter Schools Mediated | Joint Model Free Mediated | Joint Model Fixed Parameters Mediated |
|---|---|---|---|---|---|---|
| CFI (Comparative Fit Index) | Values > 0.9 | 0.95 | 0.97 | 0.94 | 0.95 | 0.91 |
| TLI (Tucker Lewis Index) | Values > 0.9 | 0.95 | 0.96 | 0.93 | 0.94 | 0.90 |
| RMSEA (Root Mean Square Error of Approximation) | Values < 0.08 | 0.06 | 0.05 | 0.08 | 0.06 | 0.08 |
| SRMR (Standardized Root Mean Square Residual) | Values < 0.10 | 0.06 | 0.06 | 0.08 | 0.07 | 0.17 |

Table 5: Fit indices for the final model.

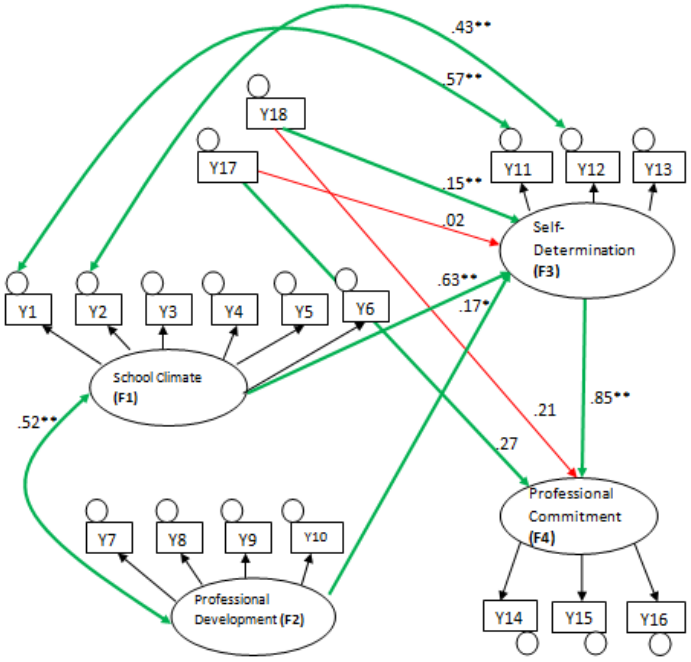


Figure 5: Final General Model with direct paths to professional commitment removed from School Climate and Professional Development.

Note that as in the earlier model, the joint fixed model fit indices do not meet the criteria for adequate fit, meaning that the two samples fit the model adequately only when the parameters (both measurement and structural paths) are allowed to vary freely. This could mean that the two samples vary in the ways in which the scale items loaded on the latent factors in the model, making it difficult to interpret the results of the general model for both samples. However, the general model in figure 5 is without obvious the obvious data issues of the previous model, making model mis-specification seem a likely culprit for the observed Heywood Case. The estimated models for the model modification are below in figure 6.

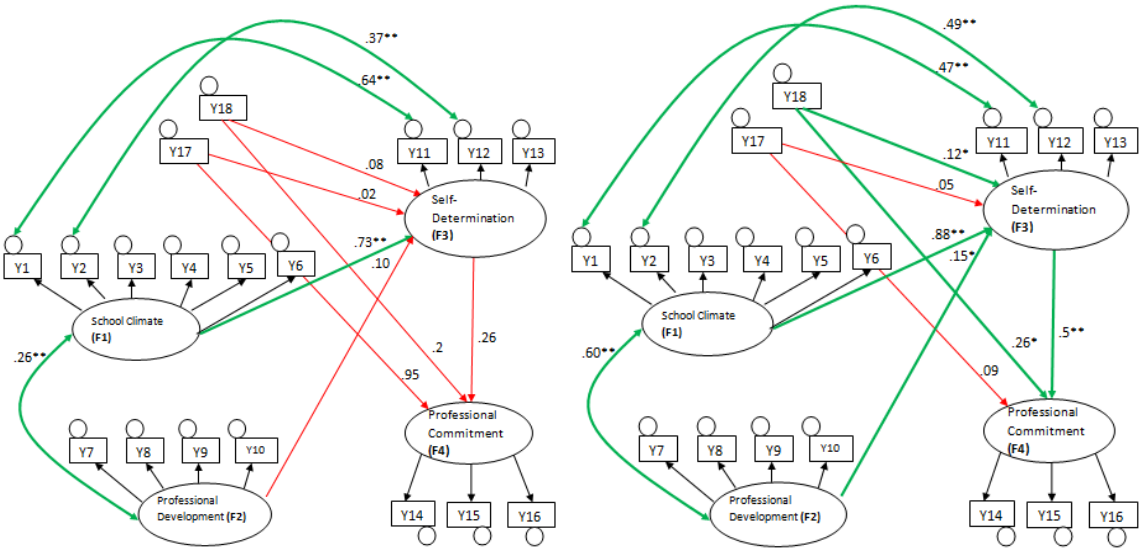


Figure 6: Final Public School (1) and Charter School (2) models with direct paths from school climate and professional development to professional commitment removed.

Interestingly, while the fit statistics for the modified public school model were excellent, there appear to be data issues in this model that make interpretation difficult. The Harmony model, on the other hand, is relatively easy to interpret, given the relevant theory and knowledge about the Harmony environment. Below is an outline of relevant findings as they relate to each of the hypotheses stated above. Since each model will be discussed separately, it is appropriate to address hypotheses 6 and 7 first, and then discuss related findings in hypotheses 1-5 for each of these models.

***Addressing Hypotheses***

*Multiple Group Comparison Hypotheses*

6) *There exists no significant difference in the factor loadings of the measured variables on the latent variables in the model for traditional public school teachers as compared to charter school teachers.* There was no significant difference between the measurement models for the two groups. In other words, once the error variance for the sub-scales for Collegial Leadership with Autonomy as well as Teacher Professionalism with Relatedness were allowed to co-vary, the sub-scales contributed significantly to the proposed factors for all groups. However, this does not mean that for both groups the sub-scales contributed in the same way to the formation of the factor. The final model allowed all paths to vary freely, including those in the measurement model, indicating that between the two groups, the contribution of the latent variables to their constructs carried different weights. For example, if Academic Press was more salient to teachers' perceptions of School Climate for Charter

School Teachers, the weight for that sub-scale might be greater than for Public School Teachers.

7) *There exists no significant difference in the relationships between latent variables in the model for traditional public school teachers as compared to charter school teachers.* While the final joint fixed model provides a moderate fit for both Public and Charter School Teachers on all but the SRMR statistic, the difference in Chi-Square test indicated that the joint model where parameters are allowed to vary freely provides a significantly better fit for both groups, meaning that while the relationships in the model are consistently present across groups, the magnitude of those relationships is different. Due to differences between these two measurement and structural models in terms of path coefficients, it may be necessary to interpret the final models separately.

*Hypotheses of Relationships within the Models*

1) *Teacher background characteristics (experience and education) will significantly positively relate to teachers' perceptions of self-determination and professional commitment in the overall model.*

   FINAL GENERAL MODEL - Although the model fit was adequate with teachers' background characteristics included (Paths F3 and F4 to Y17), the magnitude of the relationship between years of experience and the teachers' self-determination was not significant at the .05 level. The hypothesis was not

supported in this case. The relationship of quality of field experience to professional commitment was also not significant (F4 to Y18), although the relationship between field experience and self-determination was significant (F3 to Y18).

FINAL PUBLIC SCHOOL MODEL – Although the model fit to the data was excellent for the public school population and the path coefficients are relatively large for the path between years of experience and professional commitment (F4 to Y17), none of these relationships was significant in the model (the hypotheses were not supported). There may be non-linearity issues with this data set, which will be further discussed in the limitations section below.

FINAL CHARTER SCHOOL MODEL – The model had adequate fit to the data and significant relationships were found within the model for the relationship of field experience to both teacher self-determination and professional commitment. Given that many novice teachers in the charter school sample were relatively new to teaching (mean = 4.2 years, SD = 3.8), there may have been issues with restriction of range that made it difficult to detect a relationship, should one exist, between years of experience and either self-determination or professional commitment

2) *School Climate health, as perceived by teachers, will significantly positively relate to teachers' perceptions of self-determination and professional commitment in the model.*

ALL FINAL MODELS - School climate contributed significantly to teachers' reports of self-determination (F3 to F1), which had a strong positive relationship to professional commitment. However, given the non-significant contribution of school climate to professional commitment in all models tested, the path (F4 to F1) was removed and the model was re-estimated. This result speaks to the importance of the inclusion of self-determination as a mediator of the relationship between teachers' perceptions of school climate and their professional commitment.

3) *Teachers' professional development experiences will significantly positively relate to teachers' perceptions of self-determination and professional commitment in the model.* In the relationship between teachers' perceptions of professional development to their professional commitment (F4 to F 2), a non-significant relationship was observed, which led to the removal of this path from the model and the re-estimation of model parameters. The path between professional development experiences and self-determination is significant in the general and charter school models, indicating the importance of the inclusion of self-determination in the model as a mediator. However, in the model of public schools, the path between professional development and Self-Determination (F3 to F2) was non-significant. In this case the hypothesis was not supported.

4) *Teachers' perceptions of self-determination will significantly positively predict professional commitment in the model.*

FINAL GENERAL MODEL - There was a strong positive relationship within the model between teachers' self-determination and professional commitment (F4 to F3).

FINAL PUBLIC SCHOOL MODEL - Although the path coefficient (F4 to F3) was quite large for the public school model, it was insignificant. This result may indicate an issue with the data. Possible sources are discussed below in the limitations section.

FINAL CHARTER SCHOOL MODEL - There was a strong positive relationship within the model between teachers' self-determination and professional commitment (F4 to F3).

5) . *Self-determination will serve as a significant mediator of the positive relationship between teacher background and contextual influences (teacher background, school climate, and professional development experiences) and professional commitment.* (F4 to 1 through F3, F4 to F2 through F4).

FINAL GENERAL MODEL - Self-determination was shown to have a significant mediating effect on the relationship of teacher and school characteristics to professional commitment. Furthermore, there was a significant mediating effect of self-determination on the relationship between teachers' field experiences and their professional commitment.

FINAL PUBLIC SCHOOL MODEL - The mediating effect was not significant in the general public school model. This may be due to variance

issues within the public school population. This possibility is further discussed in the limitations section below.

FINAL CHARTER SCHOOL MODEL - Self-determination was shown to have a significant mediating effect on the relationship of teacher and school characteristics to professional commitment. Furthermore, there was a significant mediating effect of self-determination on the relationship between

One relationship suggested by the fit indices which was not hypothesized is that of perceptions of school climate to professional development experiences. Although this relationship was not included in the original proposal, it makes intuitive sense that the two aspects of teachers' experiences would vary together, and the addition of the covariate relationship between these two variables increased model fit significantly for all models.

Unexpected findings include the non-significant direct effects of professional development, school climate, and years experience on professional commitment. Further investigation (discussed below) might uncover more detail regarding the non-significant results in the final public school model as well as the differences in the magnitude of relationships within the model between public and charter school populations.

# Chapter V: Discussion

The primary interests of the current study were two-fold: first, to develop a measure of teachers' perceptions of their experiences with professional development opportunities, and second, to establish a model of the relationships between teachers' background and school characteristics to their self-determination and professional commitment, looking at both the direct and indirect relationship of these background and school characteristics to teachers' professional commitment.

Results indicate support for the Professional Development Scale, both in terms of internal consistency among sub-scale items and in terms of the scale's positive relationship to teacher's perceptions of school climate, self-determination, and professional commitment. The proposed model was also partially supported with some modifications adopted through the examination of both statistical evidence and appropriate theory. The following discussion will address the implications of these findings.

Past studies have looked at some of the relationships included in the model individually, but no study to this point has 1) examined these relationships together, 2)

examined the role of professional development experiences on teachers' motivation and professional commitment, and 3) included self-determination as a mediator between teacher and school variables and professional commitment. It is this third contribution that may provide the basis for the most compelling evidence as to how we might make a difference in teachers' professional commitment. The strength of the relationship within the model between teachers' self-determination and professional commitment highlights the importance of teachers' motivation in their career decisions. If policy-makers and administrators wish to make substantial differences in teacher attrition, the results of this study suggest that they might start by looking at whether teachers' self-determination needs are being met and thinking about how they might better do so.

The models also provide some insight into what factors may be influencing teachers' motivation. Quality training, school climate and teacher professional growth opportunities all have significantly positive relationships to teacher's self-determination in the general and charter school models. It seems likely, then, that by improving school climate and teacher growth opportunities, teachers' needs will be better met, they will be more motivated, and more likely to stay. As a specific example of how this might work, research has indicated that healthy collegial leadership within schools means that administrators include teachers in the decision-making process, allowing them to be a part of shaping the culture of the school. Indeed, a recent study by Boyd, et al. (2011), found that perceptions of school administration had, by far, the most significant impact of any school characteristic included in the study on teacher retention rates. It is possible

that schools in this study whose principals were supporting teachers' self-determination needs by including them in decision-making were more likely to keep their teachers.

The model in the current study, while not appropriate for drawing causal conclusions, provides insight into directions for future inquiry. For example, if teachers throughout the school are given the co-responsibility for planning professional development opportunities, this might increase collegiality, academic press, teachers' perceptions of collegial leadership, and increase the likelihood of active/collective long-term participation in professional development activities.

The requirement of the model fit that paths are allowed to vary freely may mean that there are differences in the school environments of public and this particular group of charter school teachers that create diverse needs in terms of which aspects of school climate and professional growth are most salient to teachers' self-determination and professional commitment. These differences in strength of relationship within the model may be due to multicollinearity or non-linear relationships present in the Public School Model, or ways in which the Charter Schools are run as compared to more traditional public schools, the youth of the Charter School Teachers, or even the STEM focus of the schools. It may be important to further examine these differences in order to establish the generalizability of the model to teacher populations.

***Limitations***

As with any study based on self-report data, one limitation of the current study is that it provides only a look at teachers' perceptions. However, given that the purpose of this study is to examine how teachers' perceptions influence their professional

commitment, the self-report nature of the data is desirable. Indeed, for measures of school climate, perceptions of professional development growth experiences, and self-determination, teachers' perceptions may be more salient than related observations of teacher environment and behavior. However, in order to fully understand the relationship between teachers' perceptions of their environment, growth opportunities, and motivation to their professional commitment, it may be desirable in the future to follow teachers to determine their actual professional commitment as opposed to reports of commitment.

The construction of the Professional Development Scale is based on a body of work on characteristics of effective professional development (Garet, Porter et al. 2001; Desimone, Porter et al. 2002; Desimone 2006; Desimone 2009), which speaks to its content validity. Furthermore, the reliability (Cronbach's α) results are high, indicating favorable internal consistency, in order to make sure that the scale is measuring the intended attitudes toward PD experiences. However, it would be desirable in the future to compare it to similar measures of teacher attitudes toward professional growth opportunities in order to further establish further content validity.

It is possible that some relationships within the model are non-linear. SEM is based on the General Linear Model (GLM), which does not take into account non-linear relationships. If non-linear relationships exist it is possible that the model fit could be further improved by determining where these relationships exist and taking the non-linearity into account by performing transformations. For example, in the public school model, the relationship between teachers' years of experience to professional commitment could be expected to be non-linear with high numbers of teachers leaving in

the first five years and then later in their careers (retirement). Since the current study was more interested in the "stage" of career, the variable for years of experience was divided into categories based on previous research on teacher attrition (Borman & Dowling, 2008; Ingersol, 2003), which may have "flattened" an otherwise curvilinear relationship, providing adequate fit to the data but a non-significant contribution of years experience teaching to professional commitment and self-determination within the model. It is possible that if SEM methods that better take advantage of non-linear data had been employed, experience would have represented a significant contribution to the public school model. The non-significance of the relationships within the public school model in the presence of large path coefficients could be an indicator of this non-linearity.

Another issue relevant to the statistical analyses is that of restriction of range. Due to the significantly less experienced charter school Teacher population, there might be inadequate within-group variance to accurately detect the magnitude of relationships between the years experience variable and other variables within the model (self-determination and professional commitment), thereby negatively impacting model fit. Indeed, the only proposed relationships that were non-significant in the charter school model were those involving years of experience.

It is important to note here, also, that the charter school population in this study is not representative of the typical charter school. While it might be expected that the results from the 16 charter schools in this system could generalize to some degree to the full group of charter schools under the same administration, the unique mission and

operations of this system make it unlikely that the data from this sample represent the larger charter school population.

While multicollinearity was tested for using hierarchical regression to calculate the Variance Inflation Factor, it is possible that this method of detection is not adequate when utilizing SEM methodology. First, the latent are estimated without error, which could produce different results. For example, SEM allowed two sets of error terms to co-vary in the models in this study, which would change the magnitude of the relationship between the latent factors in the model. Second, the path coefficients are estimated simultaneously. Hierarchical methods might produce very different results. It may be useful to further investigate whether it is multicollinearity that is causing the non-significant results in the final Public School Model.

Statistical methods based on correlational relationships pose the issue of directionality. Because correlations between variables only tell us that a relationship exists, it is impossible to determine the direction of relationship from statistical analyses alone. Model building and testing must be guided by relevant theory and research. While this was the case for the current study, and it is unlikely that the relationships within the model are the reverse of the indicated direction, it is possible that some of the relationships within the model are reciprocal. However, in SEM it is advisable to start with a more parsimonious model and use fit indices and relevant theory and research to make relevant changes to the model, comparing fit at each stage.

As with other statistical methods based on correlational data, Structural Equation Modeling does not provide evidence for causal conclusions. While the ability to take into

account measurement error through latent means analysis, and the ability to indicate both correlations and covariates allow for better fit of the model to the data, there is always the possibility of inaccuracies in relationships that are in the model as well as the likelihood of additional mediating variables that have not included in the model. While SEM is not intended to include all possible related variables, it is likely that almost any model is an over-simplification of the complexity of human attitudes and behaviors.

Last, while SEM is not designed to be all-inclusive of possible variables interacting in a given situation, it may be important to consider how teachers' actual instructional practices and their students' performance inform their self-determination and professional commitment. It is possible that there exists a reciprocal relationship between teachers' instructional experiences and their perceptions of school climate, with positive school climate positively contributing to positive gains in instructional knowledge and skill and more knowledgeable teachers contributing positively to school climate. In this case I would also expect a positive relationship between teachers' instructional knowledge and skills and their self-determination.

***Future Directions***

Fortunately, the scope of the data collected as part of this study, as well as the greater study it is a part of will allow further investigation into questions relevant to the results of this study. First, it may be useful to further examine differences between the path coefficients for the two samples within the study for both the measurement and structural models. For example, if the collegial leadership parameter is deemed to contribute to a greater extent to the School Climate variable in the Charter School

Teacher data, it may be useful to further explore what in that environment may be contributing to these differences. Indeed, this one purpose of the greater study. Additionally, with the Charter School data, we have the benefit of knowing the schools at which the teachers work. Also, we will have student achievement data for each school, meaning that we can explore ways in which teacher self-determination and professional commitment contribute to or are affected by student achievement by utilizing a hierarchical design that takes into account the within-group variance of teachers and students nested within schools.

While the current study has chosen to use multiple group analysis to determine if significant differences exist between Public and Charter School Teacher data, there are other ways in which the data might be split into groups that would be relevant to the investigation of teacher attrition. For example, since research tells us that teachers leave at much higher rates from urban and inner-city schools, it may be useful to use school location as the grouping variable for which the models are compared. This might serve to provide insight into what aspects of school climate or professional development experiences are not contributing as significantly to teachers' self-determination and professional commitment in schools with high populations of traditionally underserved students. Likewise, student ethnic diversity or teacher experience might be used for similar types of model comparisons.

While motivational orientation was not included in the model for the current study, it may serve as a moderator for the relationship between teachers' school environment and growth experiences to their self-determination. Understanding more

about individual teacher characteristics that allow teachers to be more self-determined could help teacher educators and administrators alike to provide appropriate support for individuals who tend toward more controlled motivational orientations, helping them see how adopting a more autonomous orientation can benefit them and their students.

Up to this point, all of the areas for possible research could be accomplished with the data that has been collected either as part of the current study or the greater Charter School study. However, all of these investigations are based on teacher attitudes and correlational data. In order to make positive changes to practice, it would be preferable to establish causal links between these constructs. To that end, it would be illuminating to implement a program of research designed to target those areas of the school environment that are most likely to produce positive changes in teacher self-determination, using both measures of self-determination and teacher behaviors as outcomes. For example, one intervention might train groups of administrators in ways to provide appropriate professional development opportunities for teachers that offer choice of activity and conform to the characteristics of effective professional development. In order to determine the effectiveness of such an intervention, teachers at several schools throughout a district or region would be asked to 1) complete self-determination scales before and after the professional development sessions (which would be held over a period of 6 months or more over the course of the school year), and 2) measure teacher attrition at each of the intervention schools at the end of the school year and compare these data to that of demographically similar schools serving as controls (these schools would receive the intervention the following year if it proved successful). In this way, it

may be possible to clarify the direction of relationships within the model, as well as provide support for changes to administrator and teacher training (both pre and in-service) that could result in greater teacher motivation, retention, positive changes in teacher instructional practices, and student achievement.

***Conclusion***

The purpose of this study was to test a model of factors influencing teacher motivation (self-determination), and professional commitment. With the exception of the non-significant relationship of the role of teachers' years of experience within the model, all relationships provide further support for previous research findings. Through investigation of the generalizability of the model, as well as the design and implementation of experimental studies investigating the outcomes of interventions, educators may find ways to increase teachers' self-determination through changes to teacher training programs, in-service professional development, and factors affecting teachers' perceptions of school climate. In recognizing the difficulty of impacting policy and practice on a large scale, it is my hope that this line of research may contribute to the growing body of knowledge on teacher attitudes and beliefs leading to both teacher job satisfaction and teachers' decisions to leave the field.

Perhaps with a better understanding of these influences, policy-makers and administrators hoping to implement measures toward social justice might impact teachers' decisions to stay in the field, leading to less disparity in the education received by traditionally underserved populations, and indeed an improvement in teacher quality for all students.

# Appendices

## Appendix A: Survey Measures

Professional Commitment

(Vaughan, 2005)

1. To what extent do you agree or disagree with the following statement: “I plan to stay in the teaching profession until I retire.”

_ Strongly Agree (5)
_ Agree (4)
_ Disagree (2)
_ Strongly disagree (1)
_ I have not yet decided. (3)

A. Which of the following most closely describes your involvement in continuing education courses?

(This includes in-service workshops, professional development courses, and any other teacher-related courses that are not part of a degree plan.)
_ I **only** attend courses when I am required to attend. (1)
_ In addition to required courses, I usually attend **one** course during the school year (fall, spring, or summer). (2)
_ In addition to required courses, I usually attend **two** courses during the school year (fall, spring, or summer). (3)
_ In addition to required courses, I usually attend **three or more** courses during the school year (fall, spring, or summer). (4)
_ This is my first semester teaching and I have not yet attended continuing education courses. (0)

A. Which of the following most closely describes your plans for pursuing additional university-based education that is related to teaching or your subject area? (Include only coursework that is not part of a bachelor’s degree.)

_ I currently have **or** am pursuing graduate level degree (masters or PhD). (5)
_ I plan to pursue a graduate level degree. (4)
_ I am currently taking university courses that interest me but are not part of a degree plan. (3)
_ I plan to take university courses that interest me but are not part of a degree plan. (2)
_ I do not intend to pursue additional university-based education at this time. (1)

Questions 4-6 refer to your **voluntary** participation in school-related student activities. (*Consider only those activities that are **not directly related** to your classroom-based duties.*)
4. Have you volunteered in prior years in school-related student activities (e.g., student council, class or club sponsor, after-school tutoring programs, etc.)?
_ Yes (2)

_ No (0)

5. Have you volunteered this current school year in school-related student activities (e.g., student council, class or club sponsor, after-school tutoring programs, etc.)?
_ Yes (2)
_ No (0)

6. Do you intend on volunteering sometime in the next two years in school-related student activities (e.g., student council, class or club sponsor, after-school tutoring programs, etc.)?
_ Yes (1)
_ No (-1)

Teacher Self-Determination

(Vaughan, 2005, adapted from Deci & Ryan 2000 "Basic Psychological Needs Scale")

***Perceived Autonomy***
1. I feel administrators provide me with choices.
2. I am free to express my opinions on the job.
3. I can provide inputs to my administrators on how my job gets done.

***Perceived Relatedness***

4. I get along with people at my school.
5. When I get the opportunity, I like to spend time with the other teachers.
6. I consider the people I work with to be my friends.

***Perceived Competence***

7. I feel capable of helping my students successfully meet academic goals.
8. I feel capable of meeting the challenges of teaching.
9. Most days I feel a sense of accomplishment from teaching.

Response Scale:
1 = not at all true
3 = somewhat true
5 = very true

School Climate Index
Tschannen-Moran & DiPaola (2006)

1. Our school makes an effort to inform the community about our goals and achievements.
2. Our school is able to marshal community support when needed.
3. The interactions between faculty members are cooperative.
4. Teachers respect the professional competence of their colleagues.
5. The school sets high standards for academic performance.

6. Students respect others who get good grades.
7. The principal is friendly and approachable.
8. The principal puts suggestions made by the faculty into operation.
9. Parents and other community members are included on planning committees.
10. Community members are responsive to requests for participation.
11. Teachers help and support each other.
12. Teachers in this school exercise professional judgment.
13. Teachers are committed to helping students.
14. Academic achievement is recognized and acknowledged by the school.
15. Students try hard to improve on previous work.
16. The principal explores all sides of topics and admits that other opinions exist.
17. The principal treats all faculty members as his or her equal.
18. Teachers accomplish their jobs with enthusiasm.
19. Teachers "go the extra mile" with their students.
20. Teachers provide strong social support for colleagues.
21. The learning environment is orderly and serious.
22. Students seek extra work so they can get good grades.
23. The principal is willing to make changes.
24. The principal lets faculty know what is expected of them.
25. The principal maintains definite standards of performance.
26. Community members attend meetings to stay informed about our school.
27. Organized community groups (e.g., PTA, PTO) meet regularly to discuss school issues.
28. School people are responsive to the needs and concerns expressed by community members.

Response Scale:
1 = Never
2 = Rarely
3 = Sometimes
4 = Often
5 = Very Frequently

Inventory of School Climate – Teacher (ISC-T) – Support for Cultural Pluralism and School Safety (adapted) Subscales
(Brand, Felner, Seitsinger, Bums, & Bolton, 2008)

1. Staff show that they think it is important for students of different races and cultures to get along with each other.
2. Students of different races and cultures are given equal opportunities to participate in important school activities.

3. The principal lets students and staff know that prejudice or discrimination toward people from different races or cultures is not acceptable behavior.
4. Students of different races and cultures frequently work together in class projects and activities.
5. Students do things which help them learn about students of different races and cultures.
6. Have you been afraid that a student will hurt you at school?
7. Has a student attempted to or actually hit or assaulted you when you were at school?
8. Have you witnessed, or been informed about violent fights involving weapons between students at your school?
9. Has anything been stolen from your desk or classroom at school when you weren't around?
10. Have you been offered drugs or been told by students that they have been offered drugs at school?

Response Scale:
1 = Never
2 = Rarely
3 = Sometimes
4 = Often
5 = Very Frequently

Teacher Professional Development Experiences
(Dacy, 2011)

Directions: As you answer these questions, please consider your experiences over the last two years. If you have worked as a teacher for less than two years, please consider only the time since you have been teacher of record.

1. For the following set of questions, please think about your experiences participating in **in-district workshops and/or institutes**:

   A) How frequently have you participated in this type of activity?

() never () less than once /year () 1-3 times /year () 4-5 times /year () 6 + times /year

B) Over what period has this type of activity typically been spread?
() less than a day () One day ()approximately one week () more than one week but less than one month () More than one month but less than one year () One year or more

C) During these activities, how often: (1 = never, 3 = sometimes 5 = always)
- Were you given the opportunity practice with feedback?
- Were you observed by activity leaders or fellow participants with feedback provided?
- Were your lesson plans and/or your students' work reviewed by fellow participants or the activity leader?

D) To what extent do you feel that these types of professional development activities have enhanced your knowledge and skills in each of the following areas? (1 = Not at all, 3 = Some extent 5 = Great extent)
- Curriculum (e.g., units, texts, standards)
- Instructional Methods
- Assessment
- Strategies for teaching diverse student populations (e.g. students with disabilities, from underrepresented populations, economically disadvantaged, range of abilities)
- Classroom management strategies
- Other (please specify) _____

E) To what extent did these types of activities: (1 = Not at all, 5 = Great extent)
- Support your goals as a teacher?
- Serve useful to you in implementing positive changes within the classroom?
- Build upon your previous professional experiences

*Note: Each of the following questions will ask the same set of questions as were asked for in-district workshops and institutes. If teachers have participated in types other than the five listed, they will have the opportunity to answer questions about those at the end of the questionnaire.

2. For the following set of questions, please think about your experiences participating in **out of district workshops, institutes, conferences, and/or university offerings**:

3. For the following set of questions, please think about your experiences participating in **teacher study groups, collaboratives and/or networks**:

4. For the following set of questions, please think about your experiences **working with a mentor, coach, lead teacher, and/or observer:**

5. For the following set of questions, please think about your experiences **utilizing teacher resource center(s):**

Response Scale:

Part B
1 = never
3 = sometimes
5 = always
Parts C&D
1 = Not at all
3 = Some extent
5 = Great extent

Teacher Motivational Orientation

(Vaughan, 2005 from Deci & Ryan's (1985A) "General Causality Orientations Scale")

Items A – G describe seven hypothetical situations and list three ways of responding to each item. Please read each item, imagine yourself in that situation, and then consider each of the possible responses. Try to select what your response would be according to how typical or not typical EACH of the three statements describes you.

A. You’ve been promoted to a position in a city far from your present location. For each response below, select how typical or not typical each of these reactions would be for you.

11. I would feel interested in the new challenge and a little nervous at the same time.
12. I would feel excited about the higher status and salary that is involved.
13. I would feel stressed and anxious about the upcoming changes.

B. Your friend has a habit that annoys you to the point of making you angry. For each response below, select how typical or not typical each approach would be for you.

14. I would point it out each time I noticed it, so that way maybe my friend would stop doing it.
15. I would try to ignore the habit because talking about it won't do any ’good anyway.
16. I would try to understand why my friend does it and why it is so upsetting for me.

C. You had a job interview several weeks ago. In the mail, you received a form letter, which states that the position has been filled. For each response below, select how typical or not typical each of these reactions would be for you.

17. It's not what’ you know, but who you know.
18. I'm probably’ not good enough for the job.
19. Somehow, they didn't see my ’qualifications as matching their needs.

D. You have just received the results of a test you took and you discovered that you did very poorly. For each response below, select how typical or not typical each reaction would be for you.

20. I would have sad thoughts such as "I can't do anything right."
21. I would have disappointed thoughts such as "I wonder what areas I did not understand."
22. I would have angry thoughts such as "That stupid test doesn't show anything."

E. You and your friend are making plans for Saturday evening. For each response below, select how typical or not typical these approaches would be for you.

23. I would usually leave it up to my friend; he (she) probably wouldn't want to do what I'd suggest.
24. Each of us would make suggestions and then decide on something that we both feel like doing.
25. I would usually talk my friend into doing what I want to do.

F. Recently a position opened up at your school that could have meant a promotion for you. However, another teacher was offered the position rather than you. For each response below, select how typical or not typical each of these thoughts would be for you.

26. I wouldn't really have expected the job; I frequently get passed over.
27. The other teacher probably "did the right things" politically to get the job.
28. I would have probably looked at factors in my own performance that led me to be passed over.

G. You are embarking on a new career. For each response below, select how typical or not typical each consideration would be most important for you.

29. Whether I could do the work without getting in over my head.
30. How interested I was in that kind of work.
31. Whether there were good possibilities for advancement.

Response Scale:
1 = Not at all typical
3 = Somewhat typical
5 – Very typical

Teacher Background
(Vaughan, 2005)

1. Please enter your total number of years teaching at a public school. (Include the current academic year as part of this total.) _____years
2. Which of the following methods did you use to receive your teacher certification?
_ Four or five year university-based teacher certification program (2)
_ Alternative certification program (e.g., university deficiency programs, district programs, etc.) (1)
_ I have not received my teaching certificate at this time (0)
3.Which of the following best describes the amount of student teaching and/or internship experience you feel you received prior to your first classroom teaching position?
_ I did not receive any student teaching and/or internship experience. (1)
_ I received minimal student teaching and/or internship experience. (2)

_ I received moderate student teaching and/or internship experience. (3)
_ I received extensive student teaching and/or internship experience. (4)

Socio - Demographic Items

1. Please indicate the sector in which you teach. (drop down menu – public, private, charter, other)
2. Please indicate the grade or grades you teach (k-12 selections available)
3. Please indicate the subjects you teach (radio buttons – may choose multiple)
4. Please indicate the state or province in which you teach (fill in the blank)
5. Please choose the most accurate descriptor of your school's location (rural, small town, suburban, urban, inner-city)
6. Have you ever left the field of teaching and come back (yes/no)
7. If yes, please explain the circumstances (fill in the blank)
8. Do you teach at a Title 1 School? (yes/no)
9. Does the school in which you teach currently meet the No Child Left Behind Adequate Yearly Progress?

10. How would you describe the ethnic diversity of your school's student body? (0-25%, 25-50 %, greater than 50%)
11. Approximately how many students does your school serve? (fill in the blank)
12. Which grades does your school serve? (radio buttons).
13. Please indicate your sex in the field below (M, F)
14. Optional – Please indicate your ethnicity in the field below (fill in the blank)
15. Optional – Please indicate your age in the field below (fill in the blank)

## Appendix B: Additional Figures and Tables

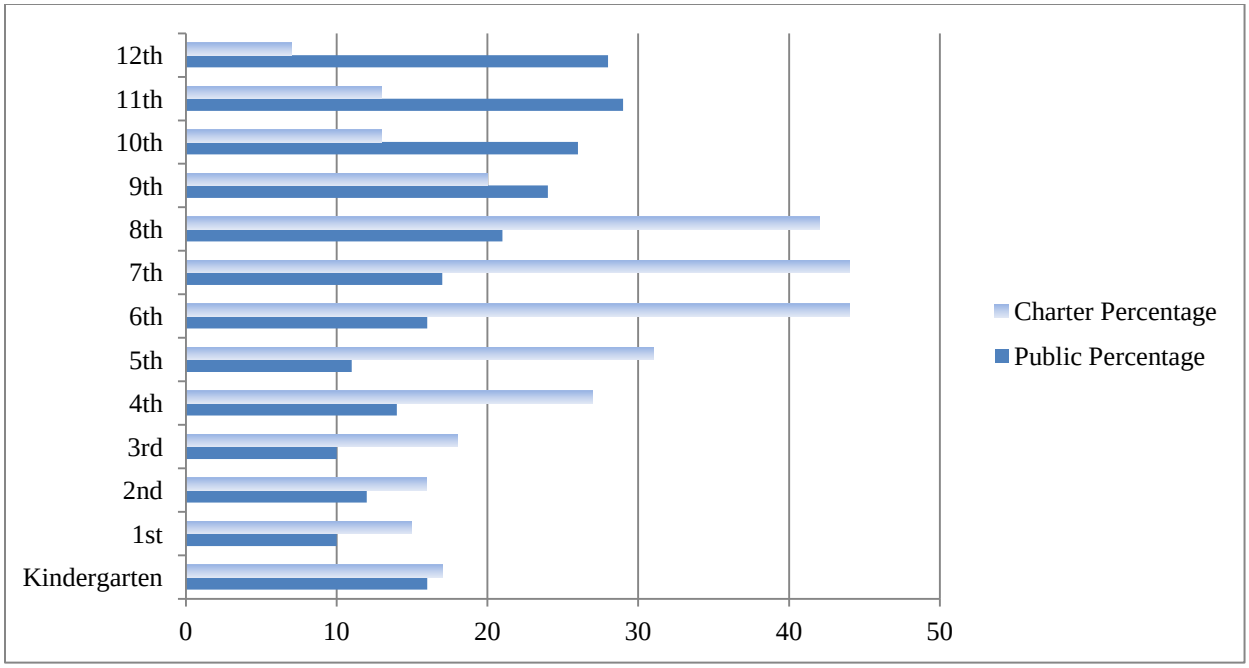


Figure 7: Percent of teachers at each grade level for public and charter schools. Note: Teachers could select multiple grades.

| Correlations | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SCCL | SCTP | SCAP | SCCE | SCCP | SCSS | PDD | PDA | PDC | PDCOH | SDA | SDR | SDC | PCL | PCCE | PCVP | e1_re | e3 |
| SCCL | 1 | | | | | | | | | | | | | | | | | |
| SCTP | .550 | 1 | | | | | | | | | | | | | | | | |
| SCAP | .638 | .630 | 1 | | | | | | | | | | | | | | | |
| SCCE | .686 | .577 | .732 | 1 | | | | | | | | | | | | | | |
| SCCP | .486 | .465 | .506 | .476 | 1 | | | | | | | | | | | | | |
| SCSS | .320 | .261 | .458 | .407 | .283 | 1 | | | | | | | | | | | | |
| PDD | .199 | .166 | .199 | .181 | .113 | .050 | 1 | | | | | | | | | | | |
| PDA | .411 | .360 | .472 | .437 | .272 | .244 | .679 | 1 | | | | | | | | | | |
| PDC | .390 | .351 | .459 | .420 | .267 | .248 | .710 | .928 | 1 | | | | | | | | | |
| PDCOH | .365 | .318 | .432 | .405 | .260 | .234 | .645 | .848 | .897 | 1 | | | | | | | | |
| SDA | .765 | .514 | .535 | .602 | .368 | .292 | .173 | .402 | .395 | .390 | 1 | | | | | | | |
| SDR | .331 | .546 | .304 | .302 | .311 | .170 | .143 | .291 | .265 | .248 | .348 | 1 | | | | | | |
| SDC | .294 | .400 | .458 | .357 | .283 | .249 | .164 | .304 | .294 | .274 | .376 | .344 | 1 | | | | | |
| PCL | .132 | .129 | .148 | .107 | .097 | .111 | .051 | .123 | .124 | .115 | .177 | .146 | .272 | 1 | | | | |
| PCCE | .121 | .058 | .122 | .107 | .062 | .022 | .218 | .189 | .201 | .261 | .166 | .046 | .110 | .071 | 1 | | | |
| PCVP | .091 | .019 | .053 | .089 | -.011 | -.028 | .086 | .097 | .073 | .059 | .051 | .071 | .104 | .033 | .098 | 1 | | |
| e1_re | -.013 | -.047 | -.130 | -.062 | -.091 | -.238 | .075 | -.110 | -.069 | -.131 | -.011 | -.050 | .001 | .148 | -.063 | .118 | 1 | |
| e3 | .071 | .101 | .063 | .045 | .102 | -.016 | .127 | .108 | .120 | .113 | .111 | .160 | .131 | .140 | .117 | .064 | .077 | 1 |

| | SCCL | SCTP | SCAP | SCCE | SCCP | SCSS | PDD | PDA | PDC | PDCOH | SDA | SDR | SDC | PCL | PCCE | PCVP | e1_re | e3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Std. Deviation | .85 | .587 | .639 | .779 | .573 | .449 | .788 | 1.178 | 1.17 | 1.212 | 1.14 | .745 | .654 | 1.091 | 2.050 | 1.041 | 1.332 | 1.039 |

Table 6: Correlation Matrix for General Models

| GROUP | SCCL | SCTP | SCAP | SCCE | SCCP | SCSS | PDD | PDA | PDC | PDCOH | SDA | SDR | SDC | PCL | PCCE | PCVP | e1_re | e3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCCL | 1 | | | | | | | | | | | | | | | | | |
| SCTP | .552 | 1 | | | | | | | | | | | | | | | | |
| SCAP | .552 | .556 | 1 | | | | | | | | | | | | | | | |
| SCCE | .534 | .514 | .644 | 1 | | | | | | | | | | | | | | |
| SCCP | .447 | .509 | .475 | .426 | 1 | | | | | | | | | | | | | |
| SCSS | .319 | .227 | .431 | .382 | .238 | 1 | | | | | | | | | | | | |
| PDD | .079 | .112 | .119 | .076 | .096 | .081 | 1 | | | | | | | | | | | |
| PDA | .181 | .158 | .207 | .182 | .199 | .095 | .686 | 1 | | | | | | | | | | |
| PDC | .151 | .156 | .219 | .164 | .218 | .116 | .715 | .838 | 1 | | | | | | | | | |
| PDCOH | .148 | .111 | .182 | .161 | .182 | .091 | .617 | .741 | .837 | 1 | | | | | | | | |
| SDA | .712 | .448 | .393 | .422 | .342 | .265 | .050 | .162 | .149 | .165 | 1 | | | | | | | |
| SDR | .322 | .486 | .218 | .250 | .322 | .148 | .165 | .241 | .211 | .192 | .342 | 1 | | | | | | |
| SDC | .292 | .270 | .404 | .342 | .241 | .270 | .101 | .170 | .169 | .148 | .412 | .291 | 1 | | | | | |
| PCL | .082 | .098 | .046 | .025 | .072 | .140 | -.085 | .014 | -.006 | -.019 | .181 | .149 | .250 | 1 | | | | |
| PCCE | .043 | .002 | .018 | .086 | -.010 | -.030 | .131 | .074 | .119 | .248 | .142 | -.040 | .058 | -.043 | 1 | | | |
| PCVP | -.009 | -.021 | -.071 | .048 | -.114 | -.049 | -.015 | .018 | .013 | -.034 | -.019 | .097 | .024 | -.018 | .057 | 1 | | |
| e1_re | .048 | .158 | .142 | .109 | .091 | .073 | -.077 | -.102 | -.024 | -.117 | .057 | .021 | .106 | .312 | -.196 | .176 | 1 | |
| e3 | .032 | .021 | .047 | .030 | .104 | .015 | .040 | .028 | .077 | .095 | .069 | .077 | .096 | .130 | .053 | -.016 | .054 | 1 |

| | SCCL | SCTP | SCAP | SCCE | SCCP | SCSS | PDD | PDA | PDC | PDCOH | SDA | SDR | SDC | PCL | PCCE | PCVP | e1_re | e3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Std. Deviation | .79141 | .56404 | .59399 | .71770 | .59049 | .48247 | .73334 | .87100 | .88150 | .97935 | 1.10780 | .77646 | .66100 | 1.11037 | 2.11676 | 1.07233 | 1.18976 | 1.006 |

Table 7: Correlation Matrix for Public School Models

| | SCCL | SCTP | SCAP | SCCE | SCCP | SCSS | PDD | PDA | PDC | PDCOH | SDA | SDR | SDC | PCL | PCCE | PCVP | e1_re | e3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCCL | 1 | | | | | | | | | | | | | | | | | |
| SCTP | .522 | 1 | | | | | | | | | | | | | | | | |
| SCAP | .712 | .665 | 1 | | | | | | | | | | | | | | | |
| SCCE | .803 | .584 | .756 | 1 | | | | | | | | | | | | | | |
| SCCP | .493 | .347 | .443 | .440 | 1 | | | | | | | | | | | | | |
| SCSS | .256 | .152 | .232 | .241 | .179 | 1 | | | | | | | | | | | | |
| PDD | .303 | .225 | .322 | .287 | .140 | .029 | 1 | | | | | | | | | | | |
| PDA | .513 | .432 | .557 | .512 | .243 | .200 | .729 | 1 | | | | | | | | | | |
| PDC | .498 | .421 | .537 | .503 | .227 | .209 | .755 | .958 | 1 | | | | | | | | | |
| PDCOH | .468 | .402 | .513 | .489 | .240 | .197 | .688 | .881 | .915 | 1 | | | | | | | | |
| SDA | .799 | .540 | .621 | .725 | .341 | .208 | .285 | .516 | .516 | .501 | 1 | | | | | | | |
| SDR | .313 | .587 | .327 | .291 | .236 | .067 | .129 | .291 | .265 | .242 | .318 | 1 | | | | | | |
| SDC | .263 | .491 | .472 | .306 | .267 | .095 | .228 | .347 | .334 | .313 | .305 | .369 | 1 | | | | | |
| PCL | .177 | .163 | .266 | .183 | .131 | .101 | .162 | .205 | .219 | .216 | .174 | .147 | .299 | 1 | | | | |
| PCCE | .177 | .092 | .197 | .091 | .117 | .035 | .299 | .257 | .249 | .271 | .168 | .117 | .143 | .184 | 1 | | | |
| PCVP | .170 | .036 | .138 | .118 | .084 | -.065 | .177 | .134 | .095 | .105 | .100 | .032 | .173 | .082 | .134 | 1 | | |
| e1_re | .183 | .045 | .180 | .215 | .016 | -.018 | .289 | .278 | .288 | .177 | .202 | .073 | .175 | .059 | .156 | .198 | 1 | |
| e3 | .118 | .194 | .136 | .083 | .125 | -.020 | .201 | .187 | .174 | .147 | .162 | .264 | .185 | .152 | .186 | .150 | .100 | 1 |

| | SCCL | SCTP | SCAP | SCCE | SCCP | SCSS | PDD | PDA | PDC | PDCOH | SDA | SDR | SDC | PCL | PCCE | PCVP | e1_re | e3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| St.Dev | .89492 | .58582 | .57895 | .76444 | .52196 | .30946 | .84262 | 1.33460 | 1.32879 | 1.32784 | 1.13258 | .69650 | .63324 | 1.07690 | 1.98215 | 1.01291 | .93476 | 1.072 |

Table 8: Correlation Matrix for Charter School Models

| | | N | Mean | Std. Deviation |
|---|---|---|---|---|
| SCCL** | Public | 283 | 3.79 | .79 |
| | Harmony | 273 | 4.07 | .89 |
| | Total | 556 | 3.93 | .85 |
| SCTP** | Public | 291 | 4.06 | .56 |
| | Harmony | 280 | 4.31 | .59 |
| | Total | 571 | 4.18 | .59 |
| SCAP** | Public | 286 | 3.66 | .59 |
| | Harmony | 285 | 4.18 | .58 |
| | Total | 571 | 3.92 | .64 |
| SCCE** | Public | 286 | 3.54 | .72 |
| | Harmony | 267 | 4.03 | .76 |
| | Total | 553 | 3.77 | .78 |
| SCCP** | Public | 286 | 4.15 | .59 |
| | Harmony | 270 | 4.42 | .52 |
| | Total | 556 | 4.28 | .57 |
| SCSS** | Public | 281 | 4.41 | .48 |
| | Harmony | 275 | 4.80 | .31 |
| | Total | 556 | 4.61 | .45 |

Table 9: Mean comparisons on School Climate Sub-scales. ***Indicates significance at the .001 level*

| | | N | Mean | Std. Deviation |
|---|---|---|---|---|
| PDD | Public | 285 | 1.85 | .73 |
| | Harmony | 283 | 1.86 | .84 |
| | Total | 568 | 1.85 | .79 |
| PDA** | Public | 276 | 1.82 | .87 |
| | Harmony | 268 | 2.54 | 1.33 |
| | Total | 544 | 2.17 | 1.18 |
| PDC** | Public | 276 | 2.01 | .88 |
| | Harmony | 268 | 2.67 | 1.33 |
| | Total | 544 | 2.33 | 1.17 |
| PDCOH** | Public | 256 | 2.10 | .98 |
| | Harmony | 255 | 2.77 | 1.33 |
| | Total | 511 | 2.44 | 1.21 |

Table 10: Mean comparisons for Professional Development Sub-Scales.
*** Indicates significance at the .001 level.*

| | | N | Mean | Std. Deviation |
|---|---|---|---|---|
| SDA** | Public | 285 | 3.40 | 1.11 |
| | Harmony | 291 | 3.85 | 1.13 |
| | Total | 576 | 3.63 | 1.14 |
| SDR** | Public | 284 | 4.08 | .78 |
| | Harmony | 292 | 4.30 | .70 |
| | Total | 576 | 4.19 | .75 |
| SDC** | Public | 283 | 4.27 | .66 |
| | Harmony | 293 | 4.48 | .63 |
| | Total | 576 | 4.37 | .65 |

Table 11: Mean Comparisons of Self-Determination Sub-Scales
*** Indicates significance at the .001 level.*

| | | N | Mean | Std. Deviation |
|---|---|---|---|---|
| PCL | Public | 263 | 4.06 | 1.11 |
| | Harmony | 293 | 4.06 | 1.08 |
| | Total | 556 | 4.06 | 1.09 |
| PCCE | Public | 263 | 6.02 | 2.12 |
| | Harmony | 291 | 6.30 | 1.98 |
| | Total | 554 | 6.17 | 2.05 |
| PCVP | Public | 261 | 4.53 | 1.07 |
| | Harmony | 292 | 4.62 | 1.01 |
| | Total | 553 | 4.58 | 1.04 |

Table 12: Mean Comparisons of Professional Commitment Sub-Scales
*** Indicates significance at the .001 level (no significant differences).*

# Glossary

| *Variable* | *Description* |
|---|---|
| e1_re | Years of teaching experience, recoded into five groupings |
| e3 | Quality of pre-service field experience |
| F1: | Perceptions of School Climate |
| F2: | Professional Development Experiences |
| F3: | Self-Determination |
| F4: | Professional Commitment |
| PCCE | Professional Commitment – Community Engagement Sub-scale |
| PCL | Professional Commitment – Long-term Career Planning Sub-scale |
| PCVP | Professional Commitment – Voluntary Participation Sub-scale |
| PDA | Professional Development – Active/Constructive Sub-scale |
| PDC | Professional Development – Content Sub-scale |
| PDCOH | Professional Development – Coherence Sub-scale |
| PDD | Professional Development – Duration Sub-scale |
| SCAP | School Climate – Academic Press Sub-scale |
| SCCE | School Climate – Community Engagement Sub-scale |
| SCCL | School Climate – Collegial Leadership Sub-scale |
| SCCP | School Climate – Support for Cultural Pluralism Sub-scale |
| SCSS | School Climate – School Safety Sub-scale |
| SCTP | School Climate – Teacher Professionalism Sub-scale |
| SDA | Self-Determination – Autonomy Sub-scale |
| SDC | Self-Determination – Competence Sub-scale |
| SDR | Self-Determination – Relatedness Sub-scale |
| Y1: | Collegial Leadership |

Y2: Teacher Professionalism

Y3: Academic Press

Y4: Community Engagement

Y5: Support for Cultural Pluralism

Y6: School Safety

Y7: Duration

Y8: Active/ Collective Participation

Y9: Content Focus

Y10: Coherence

Y11: Autonomy

Y12: Relatedness

Y13: Competence

Y14: Long-term Career Planning

Y15: Continuing Education

Y16: Voluntary Participation

Y17: Teacher Years of Experience

Y18: Pre-Service Field Experiences

## References


Anderson, C. S. (1982). The search for school climate: A review of the research. *Review of Educational Research* **52**(3): 368-420.

Archer, J. (1999). New teachers abandon field at high rate. *Education Week, 18* (27), 1.

Ashton & Webb (1986) *Making a Difference: Teacher Efficacy and Student Achievement*. Monogram. White Plains, NY: Longman.

Baard, P. P. (2002). Intrinsic need satisfaction in organizations: A motivational basis of success in for-profit and not-for-profit settings. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of Self-determination Research* (pp. 255-275). Rochester: University of Rochester Press.

Baard, P. P., Deci, E. L., et al. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology* **34**(10): 2045-2068.

Bandura, A. (1986) *Social Foundations of Thought and Action: A Social Cognitive Theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, **28**(2), 117-148.

Bandura, A. (1997) *Self-Efficacy. The Exercise of Control,* Freeman, New York, N.Y.

Barnes, G., E. Crowe, and B. Schaefer. 2007. *The cost of teacher turnover in five school districts.* Washington, DC: National Commission on Teaching and America's Future.

Batt, E. G. (2010). Cognitive coaching: A critical phase in professional development to implement sheltered instruction. *Teaching and Teacher Education* **26**(4): 997-1005.

Beard, K. S., W. K. Hoy, et al. (2010). Academic optimism of individual teachers: Confirming a new construct. *Teaching and Teacher Education* **26**(5): 1136-1144.

Berman, P., McLaughlin, M., Bass, G., Pauly, E., Zellman, G. (1977). *Federal programs supporting educational change: Vol. VII. Factors affecting implementation and continuation.* (Rep. No. R-1589/7-HEW). Santa Monica, CA: RAND.

Black, S. (2001). A lifeboat for new teachers. *American School Board Journal, 188*(9), 46-48.

Black, A. E., & Deci, E. L. (2000). The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education, 84,* 740-756.

Bogler, R. and A. Somech (2004). Influence of teacher empowerment on teachers' organizational commitment, professional commitment and organizational citizenship behavior in schools. *Teaching and Teacher Education* **20**(3): 277-289.

Borman, G. D. and N. M. Dowling (2008). Teacher attrition and retention: A meta-analytic and narrative review of the research. *Review of Educational Research*: 367-409.

Boyd, D., P. Grossman, et al. (2011). The influence of school administrators on teacher retention decisions. *American Educational Research Journal* **48**(2): 303-333.

Boyle, B., Lamprianou, I., & Boyle, T. (2005). A longitudinal study of teacher change: What makes professional development effective? A report of the second year of the study. *School Effectiveness and School Improvement, 16 (1),* 1-27.

Brand, S., Felner,R.D., Shim, M., Seitsinger, A, Dumas, T. (2003). Middle school improvement and reform: Development and validation of a school-level assessment of climate, cultural pluralism, and school safety. *Journal of Educational Psychology* **95**(3): 570-588.

Brand, S., Felner, R.D., Seitsinger, A., Burns, A. Bolton, N. (2008). A large scale study of the assessment of the social environment of middle and secondary schools: The validity and utility of teachers' ratings of school climate, cultural pluralism, and safety problems for understanding school effects and school improvement. *Journal of School Psychology* **46**(5): 507-535.

Brook, C. & Oliver, R. (2003). Online learning communities: Investigating a design framework. *Australian Journal of Educational Technology,* **19**(2), 139-160.

Browne, M. W., Cudeck, R. Alternative Ways of Assessing Model Fit. In: Bollen, K., Long, J., editors. *Testing Structural Equation Models.* Sage; Newbury Park, CA: 1993. pp. 136–162.

Bryk, A., Camburn, E., Louis, K.S. (1999). Professional community in Chicago elementary schools: Facilitating factors and organizational consequences. *Educational Administration Quarterly* **35**(5): 751-781.

Burke, R. J., Greenglass, E.R., Schwartzer, R. (1996). Predicting teacher burnout over time: Effects of work stress, social support, and self-doubts on burnout and its consequences. *Anxiety Stress and Coping* **9**(3): 261-275.

Cameron, M. and A. A. Rupp (2005). A meta-analysis for exploring the diverse causes and effects of stress in teachers. *Canadian Journal of Education / Revue canadienne de l'éducation* **28**(3): 458-486.

Castle, K. (2006). Autonomy through pedagogical research. *Teaching and Teacher Education, 22,* 1094-1103.

Certo, J. L., & Fox, J. E. (2002). Retaining quality teachers. *High School Journal, 86*(1), 57-75.

Chang, M. L. (2009). An appraisal perspective of teacher burnout: Examining the emotional work of teachers. *Educational Psychology Review* **21**(3): 193-218.

Chen, F., Bolln, K. A., Paxton, P. Curran, P.J., Kirby, J.B. (2001). Improper solutions in structural equation models: Causes, consequences, and strategies. *Sociological Methods & Research.* **29**(4): 468-508.

Chin, J. (2007). Meta-analysis of transformational school leadership effects on school outcomes in Taiwan and the USA. *Asia Pacific Education Review* **8**(2): 166-177.

Ciani, K. D., Middleton, M. J., Summers, J. J., Sheldon, K. M. (2010). Buffering against performance classroom goal structures: The importance of autonomy support and classroom community. *Contemporary Educational Psychology* **35**(1): 88-99.

Coladarci, T. (1992). Teachers' Sense of Efficacy and Commitment to Teaching. *The Journal of Experimental Education* **60**(4): 323-337.

Deci, E. L. (1980). *The Psychology of Self-determination*. Lexington: D.C. Heath and Company.

Deci, E. L., Eghrari, H., Patrick, B.C., Leone, D.R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality. 62(1),* 119-142.

Deci, E.L., Powelson, C.L. (1991). Autonomy and relatedness as fundamental to motivation and education. *Journal of Experimental Education, 60 (1),* 49-66.

Deci, E.L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum Press.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227-268.

Deci, E. L., & Ryan, R. M. (Eds.). (2002). *Handbook of Self-determination Research*. Rochester: University of Rochester Press.

Deci, E.L., Vallerand, R.J., Pelletier, L.G., Ryan, R.M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist 26(3&4),* 325-346.

Desimone, L. M. (2006). Consider the source: Response differences among teachers, principals, and districts on survey questions about their education policy environment. *Educational Policy* **20**(4): 640-676.

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures." *Educational Researcher* **38**(3): 181-199.

Desimone, L. M., Porter, A. C., Garet, M. S., Yoon, K. S., & Birman, B.F.(2002). Effects of Professional Development on Teachers' Instruction: Results from a Three-Year Longitudinal Study. *Educational Evaluation and Policy Analysis* **24**(2): 81-112.

DiPaola, M. F. and Hoy, W. K. (2005). Organizational Citizenship of Faculty and Achievement of High School Students. *High School Journal* **88**(3): 35-44.

DiPaola, M. F. & Tschannen-Moran, M. (2001). Organizational citizenship behavior in schools and its relationship to school climate. *Journal of School Leadership, 11,* 424-447.

Ermeling, B. A. (2010). "Tracing the effects of teacher inquiry on classroom practice. *Teaching and Teacher Education* **26**(3): 377-388.

Emmer, E. T., Hickman, J. (1991). Teacher efficacy in classroom management and discipline. *Educational and Psychological Measurement* 51, 755-65.

Gallimore, R., Ermeling, B. A. (2009). Moving the learning of teaching closer to practice: Teacher education implications of school-based inquiry teams. *Elementary School Journal* **109**(5): 537-553.

Garet, M.S., Birman, B.F., Porter, A.C., Desimone, L., Herman, R. (1999). *Designing effective professional development: Lessons from the Eisenhower program [and] Technical Appendices.* Contract Number EA97001001. Washington DC: American Institutes for Research.

Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers." *American Educational Research Journal* **38**(4): 915-945.

Gibbs, J.J., Giever, D., & Higgins, G.E. (2003). A test of Gottfredson and Hirschi's general theory using structural equation modeling. *Criminal Justice and Behavior, 30*(4), 441-458.

Gibson, S., and Dembo, M. H. (1984), Teacher efficacy: a construct validation. *Journal of Educational Psychology* **76** (4), 569-582.

Glickman, C.D., & tamashiro, R.T. (1982). A comparison of first-year, fifth-year, and former teachers on efficacy, ego development, and problem solving. *Psychology ini the Schools.* **19,** 558-562.

Goddard, R. D., Sweetland, S. R., & Hoy, W. K. (2000). Academic emphasis of urban elementary schools and student achievement: A multi-level analysis. *Educational Administration Quarterly*, 36, 683-702.

Goddard, Y., Goddard, R. D. & Tschannen-Moran, M. (2007). A theoretical and empirical investigation of teacher collaboration for school improvement and student achievement in public elementary schools, *Teachers College Record*. **109**(4), 877-896.

Goldschmidt, P. and Phelps, G. (2010). Does teacher professional development affect content and pedagogical knowledge: How much and for how long? *Economics of Education Review* **29**(3): 432-439.

Goudas, M., Biddle, S., & Underwood, M. (1995). A prospective study of the relationships between motivational orientations and perceived competence with

intrinsic motivation and achievement in a teacher education course. *Educational Psychology, 15*(1), 89-96.

Grayson, J. L. and H. K. Alvarez (2008). School climate factors relating to teacher burnout: A mediator model. *Teaching and Teacher Education* **24**(5): 1349-1363.

Greeno, J. G., Collins, A. M., & Resnick, L. B. (1996). *Cognition and learning*. In D. Berliner and R. Calfee (Eds.), Handbook of Educational Psychology (pp. 15-41). New York: MacMillian.

Guskey, T. R., and Passaro, P. D. (1994), Teacher efficacy: a study of construct dimensions. *American Educational Research Journal* **31**, 627-43.

Halpin, A. W., & Croft, D. B. (1963). *The organizational climate of schools*. Chicago: Midwest Administration Center of the University of Chicago.

Hanushek, E. A. (1992). The trade-off between child quantity and quality. *Journal of Political Economy* **100**, (1) 84-117.

Harris, D. N., & Adams, S. (2007). Understanding the level and causes of teacher turnover: A comparison with other professions. *Economics of Education Review*, ***26***, 325–337.

Hong, S., Malik, M. L., Lee, M. K. (2003). Testing configural, metric, scalar, and latent mean invariance across genders in sociotropy and autonomy using a non-western sample. *Educational and Psychological Measurement* **63**(4): 636-654.

Hord, P. (1997) *Professional learning communities: What are they and why are they important? Issues About Change. 6: 1.*

Hoy, A. W., Hoy, W. K., Kurtz, N. M. (2008). Teacher's academic optimism: The development and test of a new construct. *Teaching and Teacher Education* **24**(4): 821-835.

Hoy, A. W. and R. B. Spero (2005). Changes in teacher efficacy during the early years of teaching: A comparison of four measures. *Teaching and Teacher Education* **21**(4): 343-356.

Hoy, W. K., and J. A. Feldman. (1987). Organizational health: The concept and its measure.
*Journal of Research and Development in Education* **20**: 20-38.

Hoy, W. K. and A. E. Woolfolk (1993). Teachers' sense of efficacy and the organizational health of schools. *The Elementary School Journal* **93**(4): 355-372.

Hoy, W. K., Hannum, J., & Tschannen-Moran, M. (1998). Organizational climate and student achievement: A parsimonious and longitudinal view. *Journal of School Leadership, 8,* 336-359.

Hu, L. and P. M. Bentler. 1999. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives." *Structural Equation Modeling* 6: 1-55.

Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal, 38*(3), 499-534.

Ingersoll, R., Smith, T. (2003). The wrong solution to the teacher shortage.*Educational Leadership* **60**(8): 30-33.

Keith, T. Z. (2006). *Multiple regression and beyond*. Pearson Education: New York.

Klassen, Usher, R., E. Bong, M. (2010). Teachers' collective efficacy, job satisfaction, and job stress in cross-cultural context. *The Journal of Experimental Education* **78** (4): 464-486.

Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling* (2nd ed.): New York: Guilford.

Kruse, S., Louis, K. S., & Bryk, A. S (1994). Building professional community in schools. *Issues in Restructuring schools*. Madison, WI: Wisconsin Center for Education Research.

Lubke, G. H., Muthén, B. (2005). Investigating population heterogeneity with factor mixture models. *Psychological Methods* **10**(1): 21-39.

Montgomery C., Rupp A. A. (2005). A meta-analysis for exploring the diverse causes and effects of stress in teachers. *Canadian Journal of Education*, 28(3), 458-486.

Marsh, H. W, Grayson, D. (1990). Public/catholic differences in the high school and beyond data: A multigroup structural equation modeling approach to testing mean differences." *Journal of Educational Statistics* **15** (3): 199-235.

Moore, W., & Esselman, M. Teacher efficacy, power, school climate and achievement: a desegregating district's experience. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA, April, 1992.

Mouza, C. (2009). Does research-based professional development make a difference? A longitudinal investigation of teacher learning in technology integration. *Teachers College Record* **111**(5): 1195-1241.

Porter, L.W., Lawler, E.E. and Hackman, J.R., 1996. Ways groups influence individual work effectiveness. In: Steers, R.M., Porter, L.W. and Bigley, G.A., Editors, 1996. *Motivation and leadership at work*, McGraw-Hill, New York, pp. 346–354.

Rigby, S.C., Deci, E.L., Patrick, B.C., Ryan, R.M. (1992). Beyond the intrinsic-extrinsic dichotomy: Self-determination and motivation in learning. *Motivation and Emotion, 16(3)*, 165-185.

Rosenholtz, S. J. (1989). *Teachers' workplace: The social organization of schools*. New York: Longman.

Ross, J. A. (1992). Teacher efficacy and the effect of coaching on student achievement. *Canadian Journal of Education*, **17**(1), 51-65.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, **80**, 1-28.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*(1), 54-67.

Ryan, R.M., & Deci, E.L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68-78.

Sagor, R. (1991). What Project Learn reveals about collaborative action research. *Education Week, 48(6).* 6-10.

Sanders, W.L., & Rivers, J.C. (1996). *Cumulative and residual effects of teachers on future student academic achievement*. Research Progress Report. Knoxville: University of Tennessee Value-Added Research and Assessment Center.

Sheldon, S. B. (2003). Linking school–family–community partnerships in urban elementary schools to student achievement on state sests. *The Urban Review* **35**(2): 149-165.

Skaalvik, E. M., Skaalvik, S. (2010). Teacher self-efficacy and teacher burnout: A study of relations. *Teaching and Teacher Education* **26**(4): 1059-1069.

Smith, T. M., Rowley, K. J. (2005). Enhancing commitment or tightening control: The function of teacher professional development in an era of accountability. *Educational Policy* **19**(1): 126-154.

Stefanou, C. R., Preencevich, K. C., DiCintio, M., & Turner, J. C. (2004). Supporting autonomy in the classroom: Ways teachers encourage student decision making and ownership. *Educational Psychologist, 29*(2), 97-110.

Stinebrickner, T. R. (1998). An empirical investigation of teacher attrition. *Economics of Education Review, 17*(2), 127–136.

Stinebrickner, T. R. (2002). An analysis of occupational change and departure from the labor force: Evidence of the reasons that teachers leave. *Journal of HumanResources, 37*(1), 192–216.

Stockard, J. and Lehman, M. B. (2004). Influences on the satisfaction and retention of 1st-year teachers: The importance of effective school management. *Educational Administration Quarterly* **40**(5): 742-771.

Supovitz, J. A., Turner, H. M. (2000). The effects of professional development on science teaching practices and classroom culture. *Journal of Research in Science Teaching* **37**(9): 963-980.

Taylor, I. M., Ntoumanis, N., Standage, M. (2008). A self-determination theory approach to understanding the antecedents of teachers' motivational strategies in physical education. *Journal of Sport & Exercise Psychology* **30**(1): 75-94.

Tschannen-Moran, M. (2003). Fostering organizational citizenship: Transformational leadership and trust. In W.K. Hoy & C.G. Miskel, *Studies in Leading and Organizing Schools* (pp. 157-179). Information Age Publishing: Greenwich: CT.

Tschannen-Moran, M. (2009). Fostering teacher professionalism in schools: The role of leadership orientation and trust. *Educational Administration Quarterly* **45**(2): 217-247.

Tschannen-Moran, M., Woolfolk-Hoy, A. (2007). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teaching and Teacher Education* **23**(6): 944-956.

Tschannen-Moran, M., Hoy, A. W., Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research* **68**(2): 202-248.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing and elusive construct. *Teaching and Teacher Education*, **17**, 783-805.

Tschannen- Moran, M., McMaster, P. (2009). Sources of self- efficacy: Four professional development formats and their relationship to self- efficacy and implementation of a new teaching strategy. *The Elementary School Journal* **110**(2): 228-245.

Uline, C., Tschannen-Moran, M. (2008). The walls speak: the interplay of quality facilities, school climate, and student achievement. *Journal of Educational Administration* **46**(1): 55-73.

U.S. Department of Education, National Center for Education Statistics (2007). *Teacher attrition and mobility: Results from the 2004-2005 teacher follow-up survey*, (NCES 2007–307). Washington, DC.

Vaughan, A. L. (2005). An interaction of teacher and school variables: Assessing influences on secondary teacher motivation, retention, school participation, and professional development. *Unpublished dissertation.*