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# Explaining Teachers' Job Satisfaction, Intent to Leave, and Actual Turnover: A Structural Equation Modeling Approach

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FLORIDA STATE UNIVERSITY

COLLEGE OF EDUCATION

EXPLAINING TEACHERS' JOB SATISFACTION, INTENT TO LEAVE, AND ACTUAL  
TURNOVER: A STRUCTURAL EQUATION MODELING APPROACH

By

SUNG-HYUN CHA

A Dissertation submitted to the  
Department of Educational Leadership and Policy Studies  
in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy

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## **ABSTRACT**

To better understand the factors related to teachers' turnover decisions in the face of high rates of teacher turnover, the study used a large national secondary dataset – the 1999-2000 Schools and Staffing Survey and the 2000-2001 Teacher Follow-up Survey. Through a structural equation modeling approach, the study aimed to identify the relative weights of three independent variables (i.e., salary, working conditions, and professional training experiences) on three dependent variables (i.e., teachers' job satisfaction, turnover intention, and actual turnover). Furthermore, it examined possible mediating effects of job satisfaction and turnover intention and any variation in the structural relationships across teacher and school characteristics.

Findings indicated that working conditions had more of an impact on all of the dependent variables than either salary or professional training experiences. Specifically, the impact of working conditions on job satisfaction and on actual turnover was about nine times and two times larger than that for salary, respectively. Teachers' professional training experiences did not have a significant impact on any of the dependent variables. Perhaps this is because the SASS did not provide teachers' perceptions about the quality of professional development programs where they participated. In addition, the association between working conditions and actual turnover was fully mediated by job satisfaction. Teachers who worked in schools with better working conditions were more likely to be satisfied with their jobs and less likely to actually leave the profession. The study did not find any significant variations in the structural relationships by the selected teacher and school characteristics.

These findings suggest that improving working conditions is more important for teachers to be satisfied and to be willing to stay than salary increase. Policy makers might do well to formulate and fund policies focused on improving working conditions for public school teachers, including professional development for principals and site-based management.

# CHAPTER I

## INTRODUCTION

Today, few scholars would disagree that the teacher is the most influential school-related factor affecting the quality of education a student receives (Darling-Hammond, 1999; Sanders & Rivers, 1996). Such recognition of the importance of highly qualified teachers is well reflected in a string of recent education reforms. In particular, the No Child Left Behind Act required that by the end of the 2005-2006 school year, every classroom in America has a highly qualified teacher who has demonstrated a high level of content knowledge and pedagogy competency in their subject matter. The problem, however, is that the nation faces a serious teacher shortage in some core subject areas. While the actual magnitude of the shortage varies by subject, region, and school type (Cooperman, 2000; Ingersoll, 2003a; Rothstein, 2002), there is an apparent gap between the projected demand and real supply of qualified teachers.

A national statistical projection suggests that more than 2 million new public school teachers will need to be hired between 1999 and 2009, particularly in urban and remote, rural areas, and in certain academic disciplines (Hussar, 1999). The growing demand for teachers is not simply caused by large increases in student enrollments and in teacher retirements, class size reduction, and insufficient production of college graduates from teacher education programs; another key source of this challenge lies in a high rate of teacher turnover (Grissmer & Kirby, 1997; Ingersoll, 2003a).

A large number of qualified teachers abandon their teaching careers for reasons other than retirement (Ingersoll, 2001). One recent estimate of the annual teacher turnover rate is almost 16% (Ingersoll, 2003). Teacher turnover among beginning teachers is of particular concern. According to the National Center for Educational Statistics, 25% of new teachers quit the profession within the first 5 years of teaching in order to pursue other careers, and 40%

of those who leave say they would not teach again (Henke, Chen, Geis, & Knepper, 2000). A more recent national commission report shows that about one third of all new teachers leave the classroom within three years, and nearly half exit the teaching profession within only five years (National Commission on Teaching and America's Future, 2003).

Although teacher turnover may provide some positive outcomes such as the loss of incompetent teachers (Macdonald, 1999), it can also contribute to distributional inequity of the quality of education service in some critical subjects (e.g., math and science) and regions (e.g., urban or rural districts). Furthermore, teacher turnover produces costs and disruption associated with recruiting, hiring and induction efforts (Boe, Bobbitt, Cook, Whitener, & Weber, 1997; Shen, 1997).

Facing the problem of the high rate of teacher turnover, a number of states and districts have tried to recruit and retain qualified teachers through policy interventions such as financial incentives, programs to improve working conditions, and professional training programs (induction/mentoring programs and professional development programs). Along with a variety of strategies to reduce teacher turnover, there is an abundance of research related to teacher turnover that examines the effects of these interventions. Most of the studies, in general, used separate regression type models to explore each of the effects rather than incorporate variables in the models into a single model.

This study is designed to gain a more complete understanding of the effects and relative weights of teacher salary, working conditions, and professional training experiences on job satisfaction, turnover intention, and actual turnover. Furthermore, the study examines the influence of teacher- and school-specific characteristics on the relationships among a set of constructs related to teacher turnover by analyzing national secondary datasets, the 1999-2000 Schools and Staffing Survey (SASS) and the 2000-2001 Teacher Follow-up Survey (TFS), using a structural equation modeling approach.

This introductory chapter presents the background of the study, the purpose of the

study, and the statement of the problem, followed by the research questions, and the study's limitations. Chapter II provides a theoretical lens looking at turnover and a review of the present literature regarding factors related to teacher turnover, including a conceptual framework. Chapter III describes the methodology for the study in detail, which includes the research design, data source, variables, model and equations, and data analysis procedures. Chapter IV presents the research findings, and Chapter V offers a discussion of how the findings assist educational leaders and policy makers in retaining talented and enthusiastic teachers.

### **Background of the Study**

Decisions to quit teaching or switch schools and districts are not a new source of concern among educators and state policy makers. In fact, teacher turnover in public K-12 school systems has been moderately stable for most of the twentieth century. In 1924, 16% of public teachers turned over annually (National Education Association, 2004), in comparison with 19% in 1969 (Metz & Fleischman, 1974), and 16% in 2000 (Ingersoll, 2003). Lortie (1975) concluded that the teaching profession is marked by high turnover.

Yet public awareness and concern about teacher turnover is now at an all time high. This apprehension is intensifying for several reasons. There is a push for smaller class sizes in many elementary and secondary schools. This press for reduction in class size comes at a time when the number of students enrolled in public elementary and secondary schools reached about 48.7 million in 2004 and is expected to increase an additional 9 percent between 2004 and 2016 (National Center for Education Statistics, 2007). A large number of current teachers have over 20 years of teaching experience and are scheduled to retire during the next decade (NCTAF, 2003). The nature of these problems will create a demand for 2 million new teachers in the next decade (NCTAF, 2003).

Furthermore, the No Child Left Behind Act of 2001 draws public attention to the

teacher shortage crisis. The Act requires highly qualified teachers for every classroom to ensure that all children have an opportunity to learn, regardless of income, background, or ethnic identity (Hess & Petrilli, 2006). Under the NCLB Act, by 2006, all public elementary and secondary teachers were required to hold at least a bachelor's degree, meet statutory definitions of competency in the subjects that they teach, and have full state licensure or certification. These rigid requirements may aggravate the teacher supply problem by preventing some teacher candidates from entering the teaching profession.

To deal with the growing demands for teachers in classrooms, many studies and the popular press are urging colleges and other possible preparation providers to expand teacher education programs and open up alternative routes for other interested professionals to become teachers in order to fulfill the rising demands for teachers (Darling-Hammond, 1999; Feistritzer & Chester, 2001; Murnane, Singer, & Willett, 1989). The effectiveness of such policies to resolve the shortage of new teachers is in doubt. There are millions of people who have earned teacher certificates but have never taught (Feistritzer & Chester, 2001).

In recent years, researchers have turned their attention to another side of the teacher shortage problem: an unusually high turnover rate (Ingersoll, 2002, 2003a; Murnane & Olsen, 1990; Pisciotta, 2000). They claim that the larger struggle in confronting the teacher shortage has more to do with teacher retention than with teacher recruitment. They emphasize data that show that nationwide, on average, approximately half of all new teachers exit the profession during their first 5 years of teaching (Ingersoll, 2003).<sup>1</sup>

Educators and researchers claim that the consequences of not having enough properly qualified teachers to fill every classroom are severe and include, for example, teachers teaching out of their subject field or certification, poor student performance, an inability to

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<sup>1</sup> Recent research by Harris and Adams (2004) using the Current Population Survey, however, suggests that teacher turnover is not significantly higher than for similar professions involving teaching such as nursing, social work, and accounting.

implement class size reduction initiatives, a high drop out rate of students (Ingersoll, 1998; Lewis, 1998; Pisciotta, 2000). In particular, some researchers suggest that teacher turnover has caused a gradual and continuous erosion of professional maturity that cannot be immediately restored – an erosion that directly influences student achievement (Ingersoll & Rossi, 1995; Shen, 1997). In addition, others argue that the persistent teacher turnover has caused greater costs and disruption associated with recruiting, hiring and induction efforts (Boe et. al., 1997; Shen, 1997). According to Wong and Asquith (2002), every teacher who leaves within 3 years costs taxpayers an estimated \$50,000 in recruitment costs, personnel expenditures, and lost productivity. Because of the costs, disruptions, and effects of teacher turnover, researchers and policy makers have expended an enormous amount of time and energy studying causes and effects of turnover and developing appropriate policies.

The determination of why teachers decide to leave their job is difficult because of the complexity of turnover decision processes involving a large number of variables. Human capital theory in economics provides a useful framework of understanding some underlying factors that may contribute to an individual's decision to become a teacher, and subsequently, to remain in or leave teaching. Generally speaking, human capital theory identifies a turnover decision on the basis of the real or perceived value of the job in relation to the investment an individual has made to become a teacher (Becker, 1993; Ehrenberg & Smith, 2003). One of the major principles of human capital theory is that the greater the amount of knowledge and skills accumulated in a job over time from investments in education and job training, the lower one's probability of turnover from that occupation (Ehrenberg & Smith, 2003; Kirby & Grissmer, 1993). Focusing on the costs and benefits, if the present value of the benefits associated with turnover exceeds the costs, people will make a decision to change.

In other words, teachers whose foregone rewards (i.e., opportunity costs of teaching) outweigh the rewards gained from teaching will be more likely to leave the teaching profession. Expected utilities from a turnover decision are influenced by entry requirements,

future benefits such as better salary (monetary attribute) and working conditions (non-pecuniary attribute), and personal and professional benefits (Brewer, 1996; Kirby & Grissmer, 1993). Put differently, from the perspective of the labor market, individuals will become teachers or remain teachers if teaching represents the most attractive activity to pursue among all those activities available to them. Thus, the supply of teachers depends on the attractiveness of the teaching profession. In principle, the key to attract and retain qualified teachers is to make the teaching profession more attractive than other occupations by creating rewards that outweigh the opportunity costs of becoming or remaining a teacher. Comparable changes in policies related to compensation, licensure requirements, entry-level salary, professional development, working conditions, and the reputation of the profession would produce positive outcomes for the recruitment and retention of teachers. These are the policy levers that can be manipulated at the school, district, or state levels in order to bring supply in line with demand.

As a means of attracting and retaining qualified teachers, a growing number of states and districts have been designing and adopting such programs. The programs can be categorized into financial incentives, improvement of working conditions, and professional development programs, including induction/mentoring programs.

### **Financial Incentives**

A variety of financial incentive programs have been introduced as an increasingly popular teacher attraction and retention strategy in many states and districts because low salary is widely believed to be one of the chief deterrents to becoming and remaining a teacher. During 2001, 60 percent of the nation's governors considered higher pay for teachers a top priority, and legislators in 28 states introduced bills to raise teacher salary (Blair, 2001; Prince, 2002). In addition to across-the-board-salary increases, certain schools and districts have given signing bonuses and housing subsidies to draw teachers – especially for teachers

in high-need academic subjects such as math and science – to their schools in urban and rural districts (Hirsch, Koppich, & Knapp, 2001). From 1990 to 2000, the average nominal teacher salary increased by 31.5%, but the increase of the average real teacher salary when adjusted for inflation did not go over 4% during the period (Nelson, Drown, & Gould, 2002). On the contrary, some policy makers and researchers claim that increasing salary does not help to retain teachers, and that teachers are paid fairly well now (Ballou & Podgursky, 1997).

### **Working Conditions**

Though educators and policy makers agree that working conditions play a key role in keeping teachers in schools, few states and districts have created new programs to improve working conditions (Hirsch, 2005; Loeb, Darling-Hammond, & Luczak, 2005). This might be due to the limited data available from systematic evaluation of teacher working conditions. In recent, some states (e.g., Arizona, North Carolina, Georgia, Ohio and Virginia) have collected statewide teacher working conditions data to better understand the complexity of workplace environments and furthermore make valid connections to teacher retention (Hirsch, Emerick, Church, & Fuller, 2007).

The concept of working conditions has moved beyond resources, facilities, class size, student disciplines, and typical labor issues (e.g., health and safety concerns) in order to make meaningful betterment of working conditions. This includes such working conditions domains as teacher empowerment and principal leadership that have not been explored well in relation to teacher retention (Hirsch et al., 2007). Some previous studies used student demographics as measures of working conditions such as proportions of low-income and minority students (Baker & Smith, 1997; Grissmer & Kirby, 1997; Macdonald, 1999; Weiss, 1999)

### **Professional Development**

Professional development as a type of on-the-job training is an extremely widespread

practice in K-12 public schools (Jacob & Lefgren, 2004).<sup>2</sup> Thirty five states mandate professional development for current teachers to encourage teachers to deepen their knowledge and teaching skills and to renew their teaching certificates through a variety of channels such as on-site coaching, study groups, graduate coursework, observation of master teachers, and participation in curriculum development work (Choy, Chen, & Ross, 1998; Hawley & Valli, 2001).

The lack of support and guidance and orientation from schools where beginning teachers work is one of the most often-cited reasons that young teachers leave teaching, along with low salary and poor working conditions (Kelley, 2004; Smith & Ingersoll, 2004). Teacher induction/mentoring, one of the popular teacher professional training programs, has become the dominant form of support for beginning teachers over the past two decades. In the 1980s, just 15 states had induction programs for beginning teachers. By 1999, however, 38 states had established some sort of induction program targeted at supporting beginning teachers. However, these programs vary widely in terms of their duration, funding, and level of participation by new teachers (Hirsch et al., 2001). Only 22 states mandate and fund these programs.

It is a matter of no little interest to policy makers whether and how each of these policy interventions affects teachers' turnover behaviors. In examining this, turnover behavior can be well understood when it is seen as a multistage process linking individual attributes, attitudes toward the job, intent to quit, and the behavior of actually quitting (Price, 2004). Financial incentives, workplace conditions, and professional development experiences are likely to interactively influence teachers' job satisfaction, their intention to leave, and actual turnover behavior.

---

<sup>2</sup> Professional development opportunity is often considered as one of the elements of working conditions. Professional development in this study is separately discussed to highlight its effects on teachers' turnover decisions.

## **Job Satisfaction**

Job satisfaction has been the most frequently investigated variable affecting job performance and organizational effectiveness in human resources and organizational behavior and management (Griffeth, Hom, & Gaertner, 2000; Hom & Griffeth, 1995; Spector, 1997). Employees who are dissatisfied may reduce their level of effort or exit from the organization (Hom & Kinicki, 2001).

Job satisfaction can be an important policy issue since it is closely associated with teachers' work attitude and performance that ultimately affect student learning (Ostroff, 1992). Specifically, teachers' job satisfaction may influence the quality of instructional practice. Some researchers argue that dissatisfied teachers are less likely to do their best work in the classroom (Evans, 2001). In addition, highly satisfied teachers are less likely to switch schools or to quit the profession than those who are dissatisfied with low salary, poor working conditions and lack of professional development supports (Baker & Smith, 1999; MacDonald, 1999). These actions disrupt student learning and workplace climate, requiring costly recruitment efforts. Thus, teacher dissatisfaction can be a critical problem for schools, other teachers, and students, even when it does not lead dissatisfied teachers to exit immediately.

## **Intent to Leave and Actual Turnover**

Turnover intention has been a substantial variable in relation to job satisfaction and actual turnover in organizational behavior studies and applied psychology (van Breukelen, van der Vlist, & Steensma, 2004; Vandenberg & Nelson, 1999). Similar to job satisfaction, turnover intention has implications for job performance and organizational effectiveness. Teachers with high levels of turnover intention are less likely to devote themselves to teaching. Teachers with high levels of turnover intention may also be more likely to leave actually. However, the results of studies of relationship between intent to leave and actual behavior have been mixed (Vandenberg & Nelson, 1999). This is because actual turnover is

more difficult to predict than intentions, as many external factors affect turnover behavior such as childrearing (pregnancy), moving, family status, family income, and job alternatives.

It is important for policy makers and educators to understand the relationships among job satisfaction, intent to leave, and actual turnover. This will provide a better understanding of the complicated turnover process and allow for more accurate prediction of whether dissatisfied teachers or teachers with high level of turnover intention actually leave teaching. There is a large gap between the number of qualified teachers willing to teach and the number of teachers needed to fill every classroom. Certainly, since the quality of education rests upon the quality of teaching, the reduction of the high turnover rate of the most competent and talented teachers must continue to be the primary concern in American education.

### **Statement of the Problem**

Some locales and schools in this country are facing a critical demand for new teachers at the turn of the century. Many researchers and educators have identified the key source of this challenge as the high rate of teacher turnover (Ingersoll, 2003). However, there is not consensus in the literature around the factors that affect teachers' turnover decisions, and furthermore, what factors are more or less important to those decisions.

Teacher compensation and working conditions have been considered in the literature as independent variables that affect such possible dependent variables as job satisfaction, intent to leave, or actual turnover behavior. Professional training experiences in on-the-job training and induction/mentoring programs have also recently been included as potential predictors.

Overall, the research literature has shown more or less consistent findings with regard to the effect of salary or an increase in salary on job satisfaction (e.g., Perie & Baker, 1997) and decisions to stay in teaching (e.g., Brewer, 1996; Gritz & Theobald, 1996; Hanushek, Kain, & Rivkin, 1999; Ingersoll, 2001; Stinebrickner, 1998). Findings indicate that higher

salary is associated with lower teacher attrition. The effect of salary is relatively small and varies within subpopulations, suggesting modifications to current teacher compensation systems (e.g., differential pay for hard-to-staff schools).

With regard to the effect of working conditions, findings from the previous research were somewhat similar, though different components of working conditions have been studied (e.g., Hanushek, Kain, & Rivkin, 1999; Ingersoll, 2001; Weiss, 1999). Such studies used factor analysis to extract factors of working conditions and regression models to see their effects on teacher morale, commitment, and/or retention. Findings have been consistent in that teachers who felt dissatisfaction over working conditions (i.e., administrative support, autonomy, opportunity to join decision-making procedure, school safety, and student behavior, etc.) were more likely to leave the teaching profession.

The impact of professional staff development programs, particularly, on teacher job satisfaction and turnover intention and actual turnover have not been much studied in the field of education as compared to other disciplines, despite their prevalence (Guskey & Peterson, 1996; Guskey & Sparks, 1991; Smith & Rowley, 2005). Research from organizational behavior and management showed conflicting findings, suggesting that workplace training can make employees more valuable to their present firm and at the same time make them more valuable in the external labor market (e.g., Feldman, 1996; Parent, 1999). Some studies argued that on-the-job training is not a significant predictor on turnover intention of employees and if any, its effect is small (e.g., Parent, 1999; Veum, 1997), while other studies found that it has a positive impact on intention to turnover (Feldman, 1996; Trevor, 2001) or actual turnover in current profession (Smith & Rowley, 2005). Moreover, previous studies on induction/mentoring programs for beginning teachers showed consistent findings that induction/mentoring programs have a positive impact on teacher retention (Henke, Chen, & Geis, 2000; Ingersoll & Smith, 2003). These studies commonly compared retention rates for those who participated in such programs and those who did not.

A brief review of the earlier literature brings up an important aspect of teacher turnover, which has not been adequately explored. First of all, few studies have probed into the possible interrelationships among salary, working conditions, professional training experiences, job satisfaction, turnover intention, and actual turnover together within a single model. Specifically, little is known about the relative importance of salary, working conditions, professional training experiences in the process of teachers' turnover decisions. Predicting which of these factors are more likely to reduce teacher attrition requires a better understanding of the relative importance of low salary, poor working conditions, and inadequate preparation and training for teachers' decisions to leave. In addition, teachers' turnover decisions have been viewed in the literature as discrete decisions, rather than a multistage process. Most of the reviewed studies have separately explored and examined the main effect of each of the factors on turnover intention and/or actual turnover behavior, often without consideration of job satisfaction as a good predictor. Finally, variations in possible interrelationships among these variables by individual teacher attributes or school characteristics have not been explored well.

Thus, it is necessary to conduct more comprehensive research which takes into consideration three types of factors simultaneously affecting three outcome variables, and the relationships among these dependent variables (i.e., job satisfaction, turnover intention, and actual turnover) within a single model. This can give rich information about which factors and teacher/school characteristics warrant special attention in order to help reduce the high rate of teacher turnover.

### **Purpose of the Study**

To better understand the factors related to teachers' turnover decisions, this study aims to assess the relative weights of salary, working conditions, and professional training experiences on teachers' job satisfaction, turnover intention, and actual turnover, parceling

out direct effects (e.g., the effect of salary on job satisfaction) and mediating effects (e.g., the effect of working condition on turnover intention mediated by job satisfaction). Furthermore, it examines whether these relationships vary across individual teacher and school characteristics, using multi-group analysis in structural equation modeling.

### **Research Questions**

The study addressed the following questions:

1. What are the relative weights of salary, working conditions, and professional training experiences on job satisfaction, turnover intention, and actual turnover?
2. How does job satisfaction (and/or turnover intention) mediate the association of each of salary, working conditions, and professional training experiences with actual turnover (and/or turnover intention)?
3. How do the direct effects and relative weights of salary, working conditions, and professional training experiences differ according to characteristics of individual teachers (e.g., gender and subject specialty) and school characteristics (e.g., school level and student demographics)?

The research questions will be addressed with the analysis of secondary datasets, the 1999-2000 Schools and Staffing Survey and the 2000-2001 Teacher Follow-up Survey.

### **Significance of the Study**

The practical significance of this study is embedded in incorporating information that can be useful in developing strategies for retaining qualified teachers where they are most needed. The rate at which teachers leave the profession for the pursuit of other careers has been a major issue across the country. Its effects are costly to the future of the profession and to the quality of education. In order to address teacher attrition, many states and districts have implemented policies to enhance financial incentives, working conditions, and professional development programs for teachers.

In developing such programs, policy makers would benefit from findings from this study that provides the relative importance of factors affecting job satisfaction, turnover intention, and actual turnover. The study also incorporates professional training programs in the model to predict teacher turnover. Recently professional development has been paid a great deal of attention but has not been well explored empirically in relation to teacher turnover, especially compared to the attention scholars have given to salary and working conditions.

In addition, this study integrated theories and background knowledge from several different disciplines, including labor economics and organizational behavior management to enrich the exploration of an education phenomenon. This interdisciplinary approach brings new light and an alternative framework to the investigation of teacher turnover and the teacher shortage. In particular, this study employed the constructs of job satisfaction and turnover intention as mediating variables between turnover factors and actual turnover behavior; these factors have not been explored well in education. These mediating constructs should help to better explain the actual teacher turnover decision process.

In terms of methodology, this study provides more accurate estimates of the relationships among factors by using a structural equation modeling approach rather than the regression type analyses that have been popular in turnover studies in education. This approach considers both measurement error and interrelationships among factors in the comprehensive analysis.

### **Limitations of the Study**

Comprehensive nationally representative survey data – the 4th wave of the 1999-2000 Schools and Staffing Survey (SASS) and the 2000-2001 Teacher Follow-up Survey (TFS) was utilized for the study. The limitations of the study are mostly related to using a secondary dataset. Unlike collecting data from a primary source in which the researcher designs the

survey to ask specific questions to extract the needed information, this study had to plan the research design and methodology to fit the available data, given the chosen topic.

Specifically, the SASS and the TFS contained a large number of yes-no questions that may limit the degree of the responses considerably. The researcher is, however, prohibited from conducting any follow-up survey or interviews in search of why teachers responded as they did due to the strict rules of confidentiality to the data. In addition, the secondary dataset used in the study did not have any measure of the quality of teacher professional training programs and did not adequately capture the nuances of any school's professional culture, which may affect teachers' turnover intention and actual turnover decisions.

Similarly, this research focuses on the central elements that are directly part of the teaching job that could be improved by education practitioners, i.e., monetary attributes, working conditions, and teacher professional training. External factors that are outside of schools (e.g., alternative job opportunities for teachers) and personal issues (e.g., teachers' health or family needs) are not discussed in this study. Though these factors are also important to consider in understanding the big picture of teacher turnover, they are not controllable by educational leaders or policy makers.

As a result of the self-report nature of the data, we cannot infer causal explanations from the findings of this study. This study is correlational, describing relationships among six constructs of interest rather than a causal study. Any attempt at a causal explanation of the results remains tentative. Thus, the term "impact" that used in the study should be understood as associations between the variables. Without controlled experimental studies, the direction of causality cannot be inferred, only conjectured (Hair et al., 1998).<sup>3</sup>

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<sup>3</sup> Causation in its strictest terms requires that there is a sufficient degree of association between the two variables, that one variable occurs before the other, that one variable is clearly the outcome of the other, and that there are no other reasonable causes for the outcome (Hair et al., 1998).

## **CHAPTER II**

### **LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK**

The review of the literature revealed the body of knowledge generated about teacher turnover, focusing on the studies that sought to identify factors associated with turnover and theories that have driven the literature. This study mainly employed theories generally associated with labor economics and labor market and psychology, especially human capital theory, social learning theory, job satisfaction theory, and teacher labor market perspectives, as a conceptual foundation to examine the relationships among the constructs about the teaching profession: salary, working conditions, teacher professional training experiences, job satisfaction, turnover intention, and actual turnover behavior. This chapter also reviewed the major literature related to factors affecting teacher turnover and job satisfaction, including personal and school characteristics. The last part of the chapter provided and discussed the conceptual framework.

#### **Theories Related to Teacher Turnover**

A number of models have been developed and tested to explain teachers' turnover behavior. These models differ in their content, but they all focus on gaining an understanding of some subset of variables that affect voluntary turnover. Additionally, these hypothetical models have in common basic concepts from either human capital theory of occupational choice or social learning theory. In short, human capital theory posits that individuals make systematic assessments of the benefits and costs of both entering and staying in or leaving in a profession, while social learning theory views turnover a result of a social learning process. Each is discussed in detail in turn.

#### **Human Capital Theory**

Human capital theory of occupational choice provides a conceptual framework for an

understanding of some underlying factors that may contribute to an individual's decision to become a teacher, and subsequently, to remain in or leave teaching. This theory basically illustrates the relationships among education and training, migration and the search for a new job in terms of investment and its returns (Becker, 1993; Ehrenberg & Smith, 2003). One of the major principles of human capital theory is that the greater the amount of knowledge and skills accumulated in a job over time from investments in education and job training, the lower one's probability of turnover from that occupation (Ehrenberg & Smith, 2000).

Expected utilities from turnover decisions are influenced by entry requirements (e.g., licensure), and future benefits such as better salary (monetary rewards), working conditions (non-pecuniary attribute), and professional training benefits. If the present value of the benefits associated with turnover exceeds the costs, individuals are more likely to make a decision to change jobs. The present value of the net benefits of turnover (i.e., the benefits minus the costs) will be larger under the following conditions: 1) greater is utility derived from the new job; 2) less happiness derived from the job of origin<sup>4</sup>; and 3) smaller immediate costs associated with change (Ehrenberg & Smith, 2003).

### **Monetary Benefits**

From the perspective of human capital theory, monetary benefits (e.g., health/life insurance, pensions) from the teaching profession can be viewed as returns on investment in education and training. Such training may make individuals more productive, resulting in higher wages and the trade-offs associated with the costs (Becker, 1993). Generally speaking, if teachers feel that their return is being lowered as they work, they will be less likely to invest in training and thus leave. In other words, teachers who have perceived that they have put too much into teaching but have not gotten enough in return decide to leave (Becker, 1993).

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<sup>4</sup> This criterion is closely related to job satisfaction and will be discussed in the section of job satisfaction later.

Unlike other professionals, the overwhelming majority of teachers in the U.S are paid according to a single salary schedule. Under the single salary schedule, all certified teaching personnel are paid according to the same schedule with no differentials reflecting field, individual effort, talent, or merit. In general, all teachers in a school district, regardless of the character of the school's working conditions, are paid according to the same salary schedule. Thus, teachers will naturally tend to gravitate to jobs with less stress, fewer demands, and more desirable working conditions or change to jobs offering higher salaries. Some economists suggest that single salary schedule be replaced by salary differentials that adjust to compensate for differences that make some jobs relatively more attractive than others. Traditional teacher compensation systems do not recognize that teachers are investors as owners of their human capital except as owners of their education levels.

### **Non-monetary Benefits**

Along with monetary benefits, teachers consider non-monetary benefits as one of the most important factors affecting their career decisions. In general, non-monetary benefits may include support from fellow teachers and administrators, the quality of school facilities and resources available, autonomy in classroom, participation in school decision-making, student learning attitudes, and assigned teaching hours. Most of the literature refers to these non-monetary benefits as working conditions; working conditions vary by school type, location, and demographics of students, teachers and parents.

Scholars differentiate between firm-specific and generic human capital. Firm-specific human capital refers to factors that cannot be transferred to other schools, while generic human capital is that which can be easily transferred to other schools and professions. Firm-specific human capital includes knowledge of school practices, seniority in the system, respect of colleagues, and other forms of autonomy and privilege (Becker, 1993; Black, 1997; Grissmer & Kirby, 1987). In principle, the more firm-specific human capital that is built up,

the less likely an individual is to leave that profession if the human capital is rewarded (Kirby & Grissmer, 1993).

Most researchers generally agree that working conditions and/or school level characteristics contribute significantly to teachers' decisions about where to work, along with monetary benefits (Ingersoll, 2001; Mont & Rees, 1996; Theobald & Gritz, 1996). Compared to monetary benefits, working conditions have received less attention in earlier literature (Barro, 1992; Ingersoll, 2001). This may be partly because of data availability at that time. As information about school characteristics and/or working conditions has become available at state and national levels, recent studies have found them to be effective predictors of teacher turnover (e.g., Hanushek, Kain, & Rivikin, 1999).

### **Professional Training Benefits**

Individuals increase their store of human capital through formal schooling and on-the-job training which includes induction/mentoring programs and professional development programs. Training as investment in human capital can be labeled as general or specific. General training that accumulates generic human capital can be defined as any training that can be easily transferred to other professions and can increase an individual's future wages or benefits (Kirby & Grissmer, 1993). In contrast, specific training that builds up firm-specific human capital can be defined as training which is specific to the school in which a teacher teaches or another school in the district (Kirby & Grissmer, 1993).

A firm may not be alarmed when employees quit who have only general training, meaning those who have a college degree unrelated to education and no experience. Firms have little incentive to offer them more wages because firms have not yet invested in them with specific training. In a similar vein, employees with specific training have less incentive to quit and firms have less incentive to fire them, implying that quit rates are inversely related to the amount of specific training received by an employee. This implies that teachers with

specific training are less likely to leave teaching than those with general training.

Professional training has important implications on the relation between earnings and age. That is, beginning teachers receiving a greater degree of training at younger ages receive lower salary during the training period and higher earnings at later ages because the return is collected at a later time. In general, patterns of earnings of trained persons are low during that training period, rise sharply at the end, and then level off (Ehrenberg & Smith, 2000). If training costs were paid, many persons would seek training, few would quit during the training period but labor costs would be high. What this means for teacher turnover is that if the benefits of the teaching experience outweigh the costs during this training period, more teachers would be retained. This explains high turnover rates of beginning teachers who are still in the training stage of their careers.

Human capital theory conceptualizes decisions individuals make to stay in or leave teaching as rational and based on the real or perceived value of the job versus the investment made to become a teacher. However, affective experiences also influence job satisfaction and commitment, and final turnover decisions come only after socio-psychological considerations: one's values, emotions, and cognitions.

### **Social Learning Theory**

Unlike human capital theory, social learning theory applied to career decisions emphasizes the interaction of personal characteristics, previous behavior (social learning experience), and environmental determinants (Chapman, 1984). Krumboltz (1979) identified four factors that influence the nature of a career decision: genetic endowment and special abilities (e.g. gender, race, intelligence, physical characteristics), environmental conditions and events (e.g., social, cultural, political or monetary factors), learning experiences (e.g. job training opportunities, technological developments, and training resources), and task approach skills (e.g., set of skills, standards, values, work habits, perceptions, emotions, and

cognitive process). Thus, individual career decisions are seen as outcomes of a combination of four factors that interact in different ways.

Chapman (1984) and Chapman and Green (1986) expanded on Krumboltz' social learning theory and developed a public school teacher retention/attrition model. The model suggests that teacher retention is a function of: (a) teachers' personal characteristics (e.g., age, gender, and race), (b) educational preparation (e.g., degree obtained, quality of teacher preparation program, and student performance such as grade point average, course grades), (c) learning experiences (e.g., initial commitment to teaching and quality of first year teaching), (d) social and professional integration into teaching (e.g., a teacher's values, skills and abilities, and accomplishments), and (f) external influences (e.g., employment climate, alternative employment opportunities).

Chapman (1984) and Chapman and Green (1986) tested the suggested model using four groups of University of Michigan graduates with teaching certificates. The groups included (a) those who taught continuously, (b) intermittent teachers, (c) those who left teaching, and (d) those who never taught. The researchers found that the groups differed in personal characteristics, educational experience/initial commitment, professional integration into teaching, external influences, and career satisfaction. They concluded that teacher retention/ attrition is a result of the social learning process.

Focusing on psychological factors and individual processes in turnover, social learning theory of career decision provides a more comprehensive picture of the teacher turnover process than do economic models like human capital theory which focus instead on the rationality of decision-makers who weigh costs and benefits. Used in tandem, the two theories can improve our understanding of the factors associated with the turnover decision among teachers. In addition to social learning theory, job satisfaction theories help to better understand seemingly invisible relationship between factors (e.g., workplace conditions) and actual turnover behavior in the process of turnover decisions.

## **Dual-Factor Job Satisfaction Theory**

Various theorists have proposed models that map out the various sources of satisfaction and dissatisfaction for job satisfaction in general and for teacher satisfaction in particular. The essential underlying conceptual difficulty associated with researching job satisfaction is that there is no agreed upon definition of the term, “job satisfaction” (Evans, 1996). There does not seem to be any one all encompassing theory.

Often cited in education literature, Herzberg’s (1968) dual-factor job satisfaction theory suggests that there are two dimensions of job satisfaction: motivation and hygiene. The motivator, or intrinsic rewards includes recognition, achievement, possibility of growth, advancement, responsibility, and work itself (Hirsch et al., 2001). Motivator factors cause positive job attitudes because they satisfy the worker’s need for self-actualization, an individual’s ultimate goal (Judge, Bono, & Locke, 2000). Many enter teaching because they want to make a difference with children by successfully meeting their academic needs (Farkas, Johnson, & Foleno, 2000). Therefore, teachers are satisfied according to this view, when they can facilitate learning and cultivate positive relationships with students.

The hygiene, or extrinsic dimension is similar to that explained by human capital theory. This dimension includes salary, supervision, administrative policies, working conditions, and interpersonal relations (Herzberg, 1968). Teachers who are deprived of adequate hygiene factors accept the status quo or leave the profession.

Conceivably, teachers may have different opinions as to what makes a satisfying job. Certain positive components of teaching job could offset some negatives; depending on individual’s preferences and the importance of each component to the person. Teachers most frequently cite less discipline problems, more control over one’s own classroom and lesson plans, more administrative and professional support, more opportunity to participate in school decision making, and more involvement and collaboration of parents as the most significant factors that positively influence their job satisfaction (Farkas et al., 2000; Fraser, Draper, &

Taylor, 1998; Ingersoll & Rossi, 1995; Kim & Loadman, 1994; Ma, Xin, & MacMillan, 1999; Pisciotta, 2000). However, teachers tend to report in self-reported surveys that monetary benefits from the profession are not much important dimension in affecting their job satisfaction (Farkas et al., 2000; Fraser et al., 1998; Perie & Baker, 1997). In addition, irrelevant or lack of professional development, pressures from changing policies, strong accountability, inadequate facilities and resources, and low social respect frequently dissatisfy teachers (Boe et al., 1997; Prince, 2000).

It is import to acknowledge characteristics of teacher labor market. The labor market for teachers is nested within and continuously influenced by a larger labor market that includes the markets for all other occupations requiring roughly similar levels of education or skill. The teacher labor market perspective provides a useful theoretical lens for better understanding teacher career decisions.

### **The Characteristics of the Teacher Labor Market**

Current conditions of the teacher labor market and various educational policies for teachers have a direct impact on their decisions to enter or leave the teaching profession, and at the same time hiring practices and the screening of teachers. Although teachers and teacher candidates are under the influence of the conditions of the teacher labor market, however, the final choice of teaching as a career is affected by the preferences of teachers and teacher candidates with regard to the teaching profession at the expense of opportunity cost for other occupations available.

The market for teachers differs from most other labor markets in that salary is determined through a political process involving various levels of government, the public, and often teacher unions. Salary schedules, despite their incentives for more education and training, do not explicitly encourage teachers to strive for higher effectiveness or better outcomes. In other professions, especially the private sector, individuals usually are able to

obtain higher financial rewards for higher productivity and more advanced ability (Ehrenberg & Smith, 2003).

In general, better teachers, by any definition, are not rewarded financially (Darling-Hammond, 2000; Goldhaber, 2001; Hirsch, 2005; Sanders & Rivers, 1996).<sup>5</sup> The single compensation system that is indifferent to an individual teacher's competency and opportunity costs makes difficult recruiting and retaining teachers in certain districts and subject fields, such as math and science. That is because these teachers are more likely to find higher paying appointments outside of schools (Hassel, 2002; Price, 2004).

Another significant difference between the teacher labor market and most other service providing industries is the inapplicability of the productivity variable as a key determinant of labor demand. In most professions, more experienced or capable employees are able to produce more output than less experienced or skilled workers, and, therefore, fewer employees are needed to complete the total task (Ehrenberg & Smith, 2003).

Unlike other professionals, more experienced or capable teachers can still teach only the same number of students and classes during a workday as any other teachers in the same school. Due to contractual provisions in bargaining agreement, we cannot and do not put more students in one class just because the teacher is more effective, more experienced, has more degrees, or has obtained National Board Certification (Cohen-Vogel & Smith, 2007). Accordingly, the overall demand for teachers in a certain year is relatively fixed and inelastic, depending on the enrollment and targeted class size. In some districts with rapid growth in enrollment, uncertified and out-of-field teachers are also filling up the vacancies. The situation is worse in more disadvantaged districts. For schools with more than 50% of minority or poor students, students have more than four times the chance of being taught by non-licensed teachers than in other schools (Fuller, 1999).

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<sup>5</sup> Relatively new merit pay programs have been developed in some districts.

## **Factors Related to Teacher Turnover**

### **Salary**

In light of the national teacher shortage, some school districts have adopted various recruiting and retaining tactics in recent years, many of which are similar to those that permeate the private sector. In addition to basic salary increases (across the whole salary schedule for all teachers in the same system), some states and districts also provide additional monetary incentives for advanced certification or targeting specific subject fields or geographic areas that experience severe teacher supply problems. In addition, states, school districts, and even individual schools have offered fellowship programs, forgiveness of student loans, special mortgage and housing arrangements and other approaches to induce more interest of new teachers and young college students in the teaching profession.

For most people, it is undeniable that monetary compensation is a major rationale for working, no matter what other motivations or passions co-exist for the job. Earlier literature has shown more or less consistent views about the impact of salary or an increase in salary on decision to stay in teaching (e.g., Brewer, 1996; Hanushek, Kain, & Rivkin, 1999; Ingersoll, 2001; Stinebrickner, 1998). Overall, higher salary is associated with lower teacher attrition, but the effect of salary is small and varies within characteristics of subpopulations. For example, using several logistic regression equation models, Hanushek, Kain, and Rivkin (1999) found that salary increases reduced the likelihood that teachers in Texas would leave their district, yet teacher mobility was much more strongly related to characteristics of the students than to salary. In addition, Brewer (1996) found a positive association between teacher salary and the retention rates of only female teachers in New York between 1975 and 1990, using a discrete time hazard model.

A series of influential studies conducted by Murnane and Olsen (1989, 1990), employing data from Michigan and North Carolina, demonstrated that teacher salary is an

important determinant of the length of time that teachers stay in teaching. The results indicate that teachers who are paid more stay longer in teaching and teachers with higher opportunity costs, as measured by test scores or degree subject, stay in teaching less time than other teachers.

Many studies of the impact of salary on teacher retention, however, used data collected from districts. There are a small number of studies using large-scale surveys such as the Schools and Staffing Survey and its follow-up and asking current and former teachers about the effect of salary on their reasons for entering and leaving teaching (See, Ingersoll, 2001; Ingersoll & Alsalam, 1997; Weiss, 1999)

Ingersoll (2001), using self-reported data from the Schools and Staffing Survey of 1988-1989, 1990-1991, and 1993-1994 and the Teacher Follow-up Survey of 1991-1992 (linked with the Schools and Staffing Survey of 1990-1991), found that the level of compensation for advanced teachers (with a master's degree and 20 years of experience) had a significant positive but small effect on voluntary teacher turnover after controlling for teacher and school characteristics. Similarly, Ingersoll and his colleagues (1997), in a multi-level analysis of data from the 1990-1991 Schools and Staffing Survey, found that self-reported commitment to the teaching profession among working teachers was positively associated with the maximum possible salary level in the school. In addition, Boe, Bobbitt, Cook, Whitener, and Weber (1997), using data from the 1987-1989 Schools and Staffing Survey, found that base salary for full-time teachers was a positive and significant predictor of retention.

Furthermore, some researchers argue that previous studies had failed to produce robust estimates because they lack adequate controls for non-pecuniary aspects of teaching. Stinebrickner (1999), quite appropriately, pointed out the fact that ignoring school characteristics might lead to incorrect conclusions about the effects of wages if wages are correlated with omitted non-pecuniary school characteristics. Using data from National

Longitudinal Study of the High School Class of 1972, he analyzed the effects of policies that change the career wage structure of a person and examined the potential effectiveness of improving the non-pecuniary aspects of teaching (for example, by decreasing the pupil-teacher ratio in schools) relative to the commonly proposed wage increases. The results suggest that educational policies which target teaching wages may be more effective than educational policies which target the non-pecuniary aspects of the teaching profession (at least in terms of the pupil-teacher ratio). However, this study suffers from two limitations; the results relate to an old 1972 cohort, and non-pecuniary characteristics of teaching are limited to pupil-teacher ratios and ability level of students.

While salary may be necessary to recruit and keep qualified teachers, research has consistently demonstrated that it is not sufficient to attract and keep teachers in schools. In other words, existing studies have not provided much evidence that teachers prefer salary increase to improvement of working conditions, and furthermore that higher salary offset other deterring factors, including poor working conditions.

### **Working Conditions**

In deciding whether to remain or leave teaching, teachers make ongoing assessments of the attractiveness of teaching relative to alternative occupations or activities that they might pursue. Attractiveness of the teaching profession and satisfaction in the workplace is closely associated with working conditions.

Though there have been many studies on teachers' workplace conditions using qualitative methods from the view point of sociology and psychology (Huberman, 1993; Olsen & Anderson, 2007; Rosenholtz & Simpson, 1990; Wideen, Mayer-Smith, & Moon, 1998), little research has been devoted to the role of working conditions in the turnover decisions of teachers, using systematic national and state data gathered from teachers who remain in and leave schools since such data may not be available at that time (Hirsch et al.,

2007; Perie & Baker, 1997). Recently, however, researchers have explored the relationship between workplace conditions and teacher turnover (Baker & Smith, 1997; Ingersoll, 2003). In general, these studies, similarly, employed factor analysis to extract factors of working conditions and logistic regression models to see the effects of the extracted factors on teacher commitment, and/or retention (e.g., Ingersoll, 2001; Weiss, 1999). Findings have been fairly consistent though indicators of working conditions were different, such that teachers who felt dissatisfaction over working conditions were more likely to leave the teaching profession. In addition, previous research revealed that teachers are prone to leave schools serving high proportions of low-achieving, low-income, and minority students for more economically and educationally advantaged schools (Loeb, Darling-Hammond, & Luczak, 2005).

Ingersoll (2001) investigated the effects of organizational conditions of the schools on teacher turnover, using the data from 1993-1994 School and Staffing Survey. He extracted four factors representing working conditions through exploratory factor analysis: advanced salary, administrative support, student discipline problems, and faculty influence. He found that, in particular, low salary, inadequate support from the school administration, student discipline problems, and limited faculty influence into school decision-making all contribute to higher rates of turnover, after controlling for the characteristics of both teachers and schools. In the similar context, Ingersoll et al. (1997) found that self-reported commitment to the teaching profession among working teachers was lower for teachers in secondary schools than for those in combined schools and higher for teachers in urban and suburban schools than for those in rural schools.

Lankford, Loeb, and Wyckoff (2002) analyzed the trends in teacher career paths, choices, and inequities among schools in a descriptive analysis of personnel data on all new public school teachers in New York State who began teaching in 1993. They found that more qualified teachers have higher rates of turnover, both in terms of attrition (leaving the system altogether) and migration (switching schools and districts). There were significant differences

in turnover rates depending on the type of school. Teacher turnover rates tend to be higher in urban schools, particularly those in large urban areas. Teachers generally left schools in which the proportion of nonwhite and poor students was about 75 to 100 percent greater than in the schools to which they transferred. These findings are very similar with Hanushek, Kain, and Rivkin (1999), i.e., the pattern of teacher transitions provides strong evidence that teachers prefer particular student characteristics and somewhat weaker evidence that salary affect transitions. Schools serving academically disadvantaged students and greater proportions of minority students had greater difficulty retaining teachers than high-achieving, low-minority schools.

The similar conclusion was made in the study of Shen (1997) using data from the Schools and Staffing Survey from 1990-1991 and the Teacher Follow-up Survey from 1991-1992. That is, teachers who stayed in the same school from 1991 to 1992 were more likely to be teaching in schools with fewer inexperienced teachers and lower percentages of minority and free-lunch-eligible students. In fact, the evidence strongly suggests that teachers prefer certain types of students over others. Except for black teachers, the typical Texas teacher appears to favor higher achieving, non-minority students.

Weiss (1999) analyzed the data on first-year teachers from the Schools and Staffing Survey in 1987-1988 and 1990-1991 through factor analysis to cluster the workplace factors and ordinal logistic regression to see effects of workplace conditions on morale, commitment, and retention. The main finding of the study is that perceived school leadership and culture along with teacher autonomy and discretion were the main factors predicting high teacher morale (i.e., first-year teachers feeling that it is worthwhile to give their best effort), teachers' commitment to teaching, and the intention to remain in teaching. The study did not link these perceptions to actual teacher behavior, however. The findings of this study certainly establish a relationship between perceptions of a schools' environment and teachers' morale.

Mont and Rees (1996) examined the effect of class load characteristics and other

factors on teacher turnover, using data from the New York State Education Department's Personnel Master File for the years 1979 to 1989. Factors such as class size, number of classes taught, and percentage of class time spent in areas outside of a teacher's certification area are included along with salary, personal characteristics, and district characteristics in a model to simulate the effects of changing classroom characteristics on high school teacher turnover. The results indicate that class load characteristics are important correlates of job turnover. Average class size and teaching outside one's area of certification was found to be positively associated with the job separation of high school teachers. However, this study concluded that, controlling for average class size, the number of classes taught seems to have no effect on teacher separation rates.

The review of literature on teacher turnover indicates that there are largely two types of working conditions components. One can be characterized as organizational conditions which are driven by policy, administrator behavior, and teacher behavior; administrative support, teacher influence over school policy, teacher autonomy in classroom, collegiality, and parent involvement. The other is mainly related to generic and demographic characteristics of school/district characteristics that are largely outside the control of policy; proportion of low performing students, minority students, and students in poverty.

By including generic and demographic characteristics in analytical regression models, previous studies have provided some information about the relationship between student population and teacher turnover. However, these studies failed to extract the effect of working conditions components that are amenable to policy influence by incorporating demographic variables into regression models (Loeb, Darling-Hammond, & Luczak, 2005). Similar with studies of salary impact, in general, previous research into the impact of working conditions on teacher turnover has not considered other factors together in a single model, which may affect the effect size of the findings.

## **Professional Training Experiences**

Teacher professional development has become a growing practice in the United States (Jacob & Lefgren, 2004). Approximately seventy percent of teachers report having engaging in training related to the subject area of their main teaching assignment, including new teaching methods (Parsad, Lewis, & Farris, 2001). Continuing professional development is needed because most teachers have limited preparation in the academic content that students are required to learn and schools are being asked to educate a more diverse and disadvantaged student population to higher academic standards than ever in complex, ever-changing societies (Guskey, 2003; Knight, 2002). Increasing the content knowledge of the current teacher workforce will require an unprecedented level of on-the-job training. In general, these activities include graduate studies, participation in workshops or conferences, observing other teachers in action or being observed themselves, and seeking advanced certification.

Professional development can provide opportunities for teachers to grow personally and professionally and increases their capacity for effectiveness. In addition, such experiences increase the opportunity to interact with colleagues, to get a fresh vision for teaching, to learn or develop a new method of teaching or a new way to assess student learning or another way to manage a classroom or how to introduce technology into the current curriculum.

Participation in professional development activities signals teachers' level of commitment to their school and profession; that is, they would be less likely to invest their time, and in some cases their own money, if they plan to depart. At the same time, participation in professional development activities can serve to enhance commitment by helping teachers increase their skills and core content knowledge (i.e., their human capital). Participation in professional development activities is the main avenue through which the current teacher force is expected to achieve so-called highly qualified status as required by

the federal No Child Left Behind legislation.

Teacher professional development is a means for increasing teacher professionalism, which could have a positive influence on their commitment to, and retention in, their school and their profession. Nevertheless, most previous studies related to teacher professional development have focused on identifying components of an effective professional development program (e.g., Angrist & Lavy, 2001; Guskey, 2003; Kennedy, 1998) and examining relationships between participation in professional development activities and teachers instructional practices (Desimone, Porter, Garet, Yoon, & Birman, 2002; Smith, Desimone, & Ueno, 2005).

Few studies have examined the relationship between participation in professional development programs and teacher retention or how this relationship is affected by organizational characteristics. Some studies revealed that teachers' learning opportunities have a direct relationship with teachers' self-reported commitment to the profession (Louis, 1998; Rosenholtz, 1989) or indirect effect mediated by the level of collaboration and input into decision making (Rutter & Jacobson, 1986). Although these studies suggest that participation in professional development activities could reduce teacher turnover by increasing commitment, they did not test this outcome directly.

Recently, Smith and Rowley (2005) more directly examined relationships among school organization, participation in professional development activities, and teacher retention, using HLM analysis with the 1999-2000 SASS. They found that the impact of participation in professional development programs on reducing the likelihood of turnover is stronger in schools where teachers have greater influence over setting school policy.

On the contrary, research into the effect of on-the-job training on turnover in other employment situations has shown inconsistent findings, suggesting that workplace training can make employees more valuable to their present firm and at the same time make them more valuable in the external labor markets. Some studies argued that on-the-job training is

more likely to influence turnover intention of employees (e.g., Parent, 1999; Veum, 1997), while other studies found that it has a positive impact on intention of retention in current profession (e.g., Feldman, 1996; Trevor, 2001). In relation to job satisfaction, several studies in other employment situations support a positive relationship between satisfaction with workplace training and overall job satisfaction (e.g., Schmidt, 2004; Tansky & Cohen, 2001). For example, Tansky and Cohen (2001) analyzed the data collected from managers and supervisors in a hospital, using correlation analysis and hierarchical multiple regression analysis. They found that satisfaction with career development positively correlated with organizational commitment, which was a significant predictor as well.

The literature review indicates that the effect of teacher professional training experiences on job satisfaction and turnover needs further examination. Though there are inconsistent findings on the effect of participation in professional development program across disciplines, it can be hypothesized that those teachers who participate in the professional development programs would be less likely to transfer schools or leave teaching.

### **Teacher Characteristics**

Research on teacher turnover has tended to focus on teachers' characteristics, such as demographics, qualifications, and subject specialty, to determine those most likely to leave the profession (Bobbitt, Leich, Whitener, & Lynch, 1994; Ingersoll & Bobbitt, 1995; Murnane, Singer, Willett, Kemple, & Olsen, 1991). Despite a wealth of research, there appear to be few demographic characteristics that meaningfully predict turnover, except for age.

Some studies have determined that a teacher's age is highly influential, indicating that younger teachers and older teachers leave at much higher rates than middle-aged teachers (Grissmer & Kirby, 1997; Ingersoll, 2001; Kirby, Berends, & Naftel, 1999). Though there is little explanation of the connection between race and turnover, some studies have suggested that race is associated with attrition, with white teachers being more likely to leave than black

teachers (Ingersoll, 2001; Kirby et al., 1999; Murnane et al., 1991). In addition, teachers' gender is associated with teacher turnover, i.e., female teachers are more likely to leave schools (Gritz & Theobald, 1996; Stinebrickner, 2001; Weiss, 1999). Teachers in particular academic fields, most notably mathematics and science, are also seen as being the most difficult to retain, due to the availability of well-paying career alternatives (Ingersoll, 1999; Weiss, 1999). Ingersoll (1999), however, found that math and science teachers were no more likely to depart than other teachers, once he controlled for the effects of school and organizational characteristics. Studies have also identified special education teachers as having particularly high attrition rates (Boe, et. al., 1997).

The evidence on whether teachers with post-graduate degrees stayed in teaching longer is mixed. Several studies have found that teachers with advanced degrees at entry tended to have higher attrition rates than those entering with a bachelor's degree (Ingersoll et al., 1997; Kirby et al., 1999; Theobald, 1990). On the contrary, other studies have shown that teachers with only a bachelor's degree were more likely to leave (Adams, 1996). In addition, some studies have found that teachers with advanced certificate are more likely to switch schools or leave teaching (Boe, Bobbitt, & Cook, 1997; Henke et al., 2000; Shin, 1995)

### **School Characteristics**

Turnover studies in education have linked teacher turnover to school characteristics such as school level, sector, region, size and student poverty level, although the relationships tend to vary somewhat from study to study. The highest teacher attrition rates have been seen at urban schools in high poverty areas (Smith & Ingersoll, 2004). Similarly, Ingersoll (2001) found that teacher turnover is least likely in rural public schools. In addition, some studies found that schools with higher proportions of minority students and low-performing students tend to have higher attrition rates (Hanushek, Kain, & Rivkin, 1999; Lankford, Loeb, & Wyckoff, 2002).

Some studies suggest that there is an inverse relationship between the size of a school and the degree of teacher turnover (Ingersoll, 2001; Ingersoll & Rossi, 1995; Whitener et al., 1997). Studies have also shown that private school teachers, while more satisfied than their public school counterparts, exhibit higher attrition rates than do public school teachers (Ingersoll, 2001; Ingersoll & Rossi, 1995). This finding may be related to the fact that private schools tend to be smaller than public schools.

Others have maintained that there is a relationship between a school's level (elementary, middle or high school) and teacher attrition (Murnane et al., 1991; Shin, 1995; Weiss, 1999). Weiss (1999) found that while middle school teachers had lower morale than teachers in elementary or high schools, high school teachers were more likely than their middle or elementary school counterparts to say that they planned to leave the profession. Moreover, high school teachers report lower levels of satisfaction than do elementary school teachers (Perie & Baker, 1997).

### **Job Satisfaction**

Research on job satisfaction has focused on certain factors thought to be related to feelings of satisfaction or dissatisfaction at work, and furthermore how job satisfaction influences job commitment and turnover decision. With regard to factors affecting job satisfaction, the literature referred to such factors that are very similar with those of teacher turnover discussed above, suggesting that dissatisfied teachers are more likely to change schools (Darling-Hammond & Sclan, 1996; Ingersoll, 2001; Perie & Baker, 1997). These are also confirmed from studies in other disciplines, like organizational behavior and management and internal marketing research; i.e., job satisfaction is the primary predictor of employees' commitment to their work and intention of switching jobs (Griffeth et al., 2000; Hom & Griffeth, 1995; Knight, Durham, & Locke, 2001). In addition, job satisfaction has been used as an intervening variable between independent variables (e.g., workplace

conditions and individual variables) and outcomes (e.g., turnover intention and actual turnover (Clugston, 2000; Lambert, Hogan, & Barton, 2001)

Especially, leadership and administrative support is the most often cited component of working conditions influencing teacher job satisfaction (Ingersoll, 1999; Perie & Baker, 1997). Aspects of leadership and administrative support in the literature usually include clearly defined expectations and vision, behavior toward staff that is supportive and encouraging in school rules, teacher learning, instructional practices, recognition and rewards for a job well done, and fair distribution of teaching assignments (Eberhard et al., 2000; Pearson, 1998; Taylor & Tashakkori, 1994). The quality and type of these school leadership and administrative support correlates highly with a teacher's perception of job satisfaction and the school culture itself (Darling-Hammond & Sclan, 1996). In addition, student behaviors including school safety issues, willingness of students to learn, and the degree to which tardiness, class cutting, and misbehavior interfere with teaching are related to satisfaction (Lumsden, 1998; Perie & Baker, 1997).

Researchers have also studied the connection between teacher demographic variables and job satisfaction. Some studies also have found that job satisfaction grows as teachers become more experienced in their work (Perie & Baker, 1997), which seems logical, since unsatisfied teachers are more likely to leave the profession and, therefore, not have the chance to fully adapt to and build up a long career in teaching. Interestingly, teacher satisfaction is positively correlated with age, except for teachers between the ages of 40 to 50 (Clark, Oswald, & Warr, 1994; Robertson, Smith, & Cooper, 1992). These teachers also have low satisfaction about promotion prospects. In addition, gender has also been the center of some research on job satisfaction. On average, female employees responded to surveys with higher satisfaction ratings than their male colleagues; and the similarity has been observed in the teaching profession (Clark, 1997; Perie & Baker, 1997).

## **Turnover Intention**

Turnover intention of k-12 public teachers has been little paid attention in education, compared to faculty members' turnover intention (Barnes, Agago, & Coombs, 1998; Johnsrud & Rosser, 2002) and other disciplines (e.g., applied psychology, organization behavior, and management). Most of literature on teachers' turnover behavior has focused on actual turnover behavior. Research in applied psychology, organization behavior, and management treated turnover intention as one of the most widely studied outcomes of job satisfaction and predictors of actual turnover behavior (Currivan, 1999; Griffeth et al., 2000; van Breukelen et al., 2004; Vandenberg & Nelson, 1999). A substantial body of research has reported that turnover intention is negatively associated with job satisfaction (Hellman, 1997; Irvine & Evans, 1995; Lambert, Hogan, & Barton, 2001; Ostroff, 1992 ). Lambert et al. (2001) confirmed this negative relationship using a national sample from Quality of Employment Survey. Irvine and Evans (1995) also found the same relationship using a sample of nurses.

However, the result of relationship between turnover intention and actual turnover has been mixed in the literature (Boe, Barkanic, & Leow, 1999; Kirschenbaum & Weisberg, 1990; Miller, Brownell, & Smith, 1999). For example, Kirschenbaum & Weisberg (1990) found that turnover intention was a poor predictor of turnover in a study of 477 employees. In contrast, Steel and Ovalle (1984) concluded that turnover intentions were superior to affective variables in the prediction of actual turnover.

This inconsistency may be due to external factors that are hard to be measured and controlled (e.g., childrearing, pregnancy, moves, family status, alternative employment opportunities). Given uncontrollable impact of external factors, some scholars suggested the use of turnover intention over actual turnover (Bluedorn, 1982; Price, 2004; Price & Mueller, 1981). In addition, some studies pointed out that the variations in the turnover intent-behavior might be caused by time gap between stated intent to leave and actual leaving (Boe et al., 1999; Boe, Bobbitt, Cook et al., 1997; LeCompte & Dworkin, 1991).

## **Conceptual Framework**

The study investigated the direct effects and relative weights of salary, working conditions, and professional training experiences on teachers' decisions as to whether to stay in the profession, decisions I contend are mediated by job satisfaction and teacher turnover intention. The interaction effects of demographic characteristics of teachers and schools on turnover decisions were also examined.

The conceptual framework for this study was derived from theories and empirical studies in labor economics, psychology, organizational behavior, and education. Specifically, components of human capital theory served as the framework's basic structure. Psychological factors from social learning theory and job satisfaction theory were also incorporated. Three major clusters of factors affecting actual turnover were mainly identified under a given situation of labor market: job-related factors (i.e., salary, working conditions, and professional training experiences), individual teacher characteristics (e.g., gender, race, degree), and school characteristics (e.g., school level, location, student demographics). Job satisfaction and turnover intention were mainly identified as possible mediating variables between independent variables and outcome variables.

Each of the key elements of the conceptual framework was discussed below, as was the operationalization of key constructs for the study. Job-related characteristics that were expected to affect teacher turnover decisions consisted of three factors drawn from human capital theory. They included salary (monetary benefits), working conditions (non-monetary benefits), and professional training experiences (professional development benefits). With regard to monetary benefits, the framework suggested that offering higher wages after training than could be received elsewhere might reduce the likelihood of turnover. Most studies have found that monetary rewards significantly influence an individual's decisions when making the determination to quit a job (e.g., Brewer, 1996; Murnane et al., 1991). In this study, monetary benefits were limited to basic salary and other income from work or task

related to school-related responsibilities (e.g., coaching). Figure 2.1 graphically depicts the framework to help the reader visualize the predicted relationships among the constructs of interest.

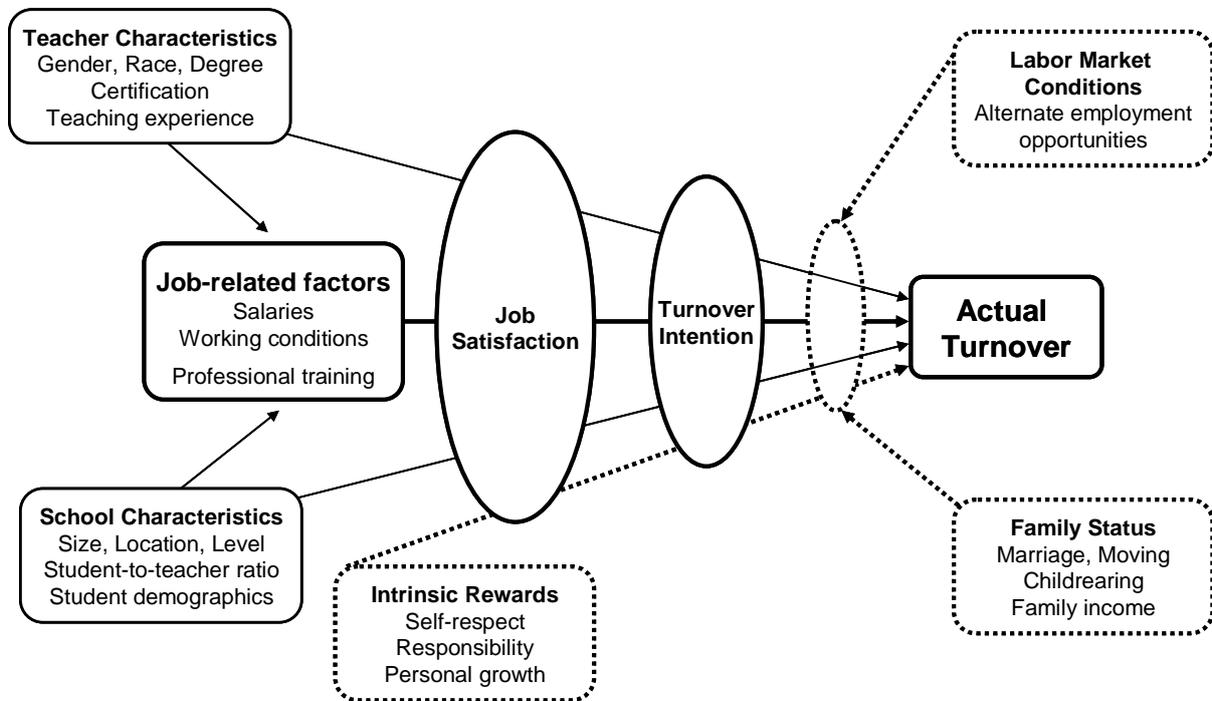


Figure 2.1 Conceptual Framework

*Salary* was used to represent monetary benefits, or the value of a teacher’s salary and additional income from schools that were self-reported, not payroll data from school districts.

*Working conditions* in this study referred primarily to the organizational climate at a particular school. Working conditions included a variety of supports from administrators, colleagues, and parents, teacher influence over school programs and control over classroom, student misbehavior, work load, safety, etc. In this regard, the construct of working conditions is distinguished from school characteristics which refer to the school setting such as school location and demographics of the students. Most of the previous studies used school or community characteristics as proxies for working conditions (Hanushek, Kain, & Rivikin, 2004), partly because of lack of data. As comprehensive national level data such as the Schools and Staffing Survey became available, however, recent studies have found that

working conditions themselves were influential predictors of teacher turnover (e.g., Ingersoll, 2001). In this study, the construct of working conditions was defined as teachers' perceived sum of non-pecuniary factors that represent the organizational climate in a certain school. By including working conditions in the framework, the study anticipated a relationship between teachers' perceptions about the conditions of their work and dependent variables.

*Professional training experiences*, the third and last job-related factor predicted to explain turnover decisions, focused on on-the-job training that accumulates firm-specific human capital rather than generic human capital. Professional training experiences (professional training benefits) in this study referred to teachers' evaluations of professional development programs that they participated in to improve professional competency and adaptation to school culture.

*Teacher and school characteristics* were included in the framework as moderating variables to examine variations in the relationships among job-related factors, job satisfaction, turnover intention, and actual turnover. Almost all of the recent teacher turnover studies in education included teacher and school characteristics as independent variables (e.g., Hanushek, Kain, & Rivikin, 1999; Ingersoll, 2001; Kirby, Berends, & Naftel, 1999; Lankford, Loeb, & Wyckoff, 2002; Shen, 1997).

For teacher characteristics, this study included gender, race/ethnicity, education attainment, certification type, and teaching experience. Some studies have found that white teachers and female teachers are more likely to leave schools. In addition, some studies suggest that teachers with advanced degrees and/or certificates (i.e., more accumulated human capital) are more likely to switch schools or leave teaching (Henke et al., 2000; Kirby et al., 1999; Shin, 1995).

While a few studies concluded that school-level factors do not play a significant role in influencing the attrition rates of teachers (e.g., Murnane et al., 1991), most studies have demonstrated associations between these characteristics and teacher turnover (e.g., Ingersoll,

2001; Mont & Rees, 1996). In particular, some studies have suggested that teachers who work with a high proportion of low-income, low-performing, and minority students are more likely to leave schools (e.g., Hanushek, Kain, & Rivikin, 2001). For school characteristics, school type, school level, school location, size, and demographics of students were considered in this study. Understanding whether teacher turnover differed by school characteristics will be important for the development of effective policy interventions to reduce teacher turnover.

In terms of the right side of the conceptual model (Figure 2.1), teacher decisions about whether to stay or leave the teaching profession can be conceptualized as a process rather than a discrete decision. That is, turnover in the study was measured with three related constructs, namely, teacher job satisfaction, intent to leave, and actual turnover. Doing so filled a gap in the literature that primarily examines actual turnover. The framework presented here assumes there are affective factors to be gained by modeling satisfaction and turnover intention along with actual decisions to leave. It is possible that different combinations of variables (e.g., a combination of job-related factors and job satisfaction and turnover intention) predict actual turnover.

*Job satisfaction* was included in the framework as a mediating variable between job-related factors and turnover intention, a decision that was influenced by dual-factor job satisfaction theory and empirical studies from organizational behavior and management. Job satisfaction in this study was simply defined as the degree to which teachers have a positive overall feeling or attitude toward the different aspects of their work (Perie & Baker, 1997; Spector, 1997).

*Turnover intention* in this study referred to teachers' self reports about the likelihood that they will leave the profession. Most studies, especially in education, have employed actual teacher turnover behavior. However, turnover studies in organizational behavior and management have usually used turnover intention as one of the most effective predictors of

actual turnover, along with job commitment and satisfaction (Billingsley & Cross, 1991; Singer, 1992; Vandenberg & Nelson, 1999). However, the results of the turnover intention-behavior relationship have been mixed in the literature. Given the inconsistent findings, this study included an investigation of the degree to which intent to leave corresponds to actual turnover.

*Actual turnover* in this study was based on numbers of “stayers” and “leavers.” Stayers were defined as teachers who taught continuously in the same school. Leavers were defined as teachers who left teaching for working in an occupation outside of the education field. This study did not include “movers,” since the study focused on factors affecting teachers’ decisions to leave, and movers were still counted in the teacher workforce at the national level. Most studies from outside education have used turnover to indicate those who left their current job or who ceased membership in an organization at their own discretion (Hom & Griffeth, 1995). Some scholars in education have included “movers” who transferred to another school within the same school district or between school districts within a state or another state in the status of teacher turnover, along with “stayers” and “leavers” (Betts, Reuben, & Danenberg, 2000; Lankford et al., 2002).

Finally, the conceptual model included possible impacts of local labor market conditions, personal factors, and intrinsic rewards that can influence teachers’ career decisions, displaying with the semi-rectangle with dotted lines in Figure 2.1. The study did not consider these factors because the data for the study did not contain possible measures of these factors.

Overall, human capital theory suggested that turnover occurs when the expected benefits of an employment change are relatively large compared to those of staying. It was certainly to be expected that teachers would leave jobs in areas of relatively low salary, poor working conditions and lack of professional training opportunities for schools or other occupations where opportunities were better and more attractive. In addition, social learning

theory and job satisfaction theory suggested that psychological factors related to work environments such as affective experience, attitudes, values, and satisfaction also function as an important lever in turnover decisions. Teachers who receive less emotional/affective support and less satisfaction are more likely to leave schools.

Additionally, the effect of job-related factors on teacher turnover was expected to vary depending on school characteristics. The basic economic concept of diminishing marginal returns might help to explain the variations. Simply, it means that the amount of output increase for each additional unit of the input generally decreases. The size of marginal returns is likely to vary by schools or districts. The effect of salary on teacher turnover may differ by the proportion of low-income students in schools where teachers teach, for example. The following chapter sets forth a research design to test the predictions outlined in the conceptual framework.

## **CHAPTER III**

### **METHODOLOGY**

This study aimed to better discern the direct effects and relative importance of salary, working conditions, and professional training experiences on job satisfaction, turnover intention, and actual turnover in the teaching profession. In addition, it sought to explain the variation in relationships among three key factors and three outcome variables across subgroups of teachers and schools, along with exploration of possible indirect effects of teachers' job satisfaction and turnover intention on actual turnover. The major part of the analysis was performed using structural equation modeling (SEM) to simultaneously examine the above relationships, using teacher's responses to the 1999-2000 Schools and Staffing Survey (SASS) and the 2000-2001 Teacher Follow-up Survey (TFS). This chapter presented the research design in more detail, including research hypotheses, description of the SASS and TFS datasets, variable selection for the key constructs, model specification and the data-analysis plan.

#### **Research Hypotheses**

From the review of theoretical and empirical literature related to teacher turnover, three sets of hypotheses were formulated. In relation to the relative weights of salary, working conditions, and professional training experiences on job satisfaction, turnover intention, and actual turnover, specifically, the following hypotheses were tested:

Hypothesis 1a: Salary, working conditions, and professional training experiences will have a positive direct impact on teachers' job satisfaction.

Hypothesis 1b: Salary, working conditions, and professional training experiences will have a negative direct impact on teachers' turnover intention.

Hypothesis 1c: Salary, working conditions, and professional training experiences will

have a negative direct impact on actual turnover behavior.

Next, whether the mediating effects of job satisfaction and turnover intention exist was examined through the tests of the following hypotheses:

Hypothesis 2a: Job satisfaction will mediate the associations between salary and turnover intention, working conditions and turnover intention, and professional training experiences and turnover intention.

Hypothesis 2b: Job satisfaction will mediate the associations between salary and actual turnover, working conditions and actual turnover, and professional training experiences and actual turnover.

Hypothesis 2c: Turnover intention will mediate the associations between salary and actual turnover, working conditions and actual turnover, and professional training experiences and actual turnover.

Hypothesis 2d: Turnover intention will mediate the association between job satisfaction and actual turnover.

Finally, the following hypotheses about possible variations in structural relationships by characteristics of teachers and schools were examined:

Hypothesis 3a: Final structural relationships will differ by teacher characteristics (e.g., gender, race, age, degree).

Hypothesis 3b: Final structural relationships will differ by school characteristics (e.g., urbanicity, percent of minority student).

### **Data Source**

Two national secondary datasets – the 1999-2000 Schools and Staffing Survey (SASS) and 2000-2001 Teacher Follow-up Survey (TFS) were analyzed using structural equation modeling. Most of the variables were drawn from the public school teacher's questionnaire section of the survey. These datasets include an array of measures about the work of teachers

such as teachers' salary, working conditions, teachers' involvement in professional development, new teachers' induction training, job satisfaction, and the demographics of teachers and schools. In addition, as discussed later, the 2000-2001 TFS data allow comparisons of teachers who stay in the same school across years, change schools, or leave the profession, while capturing their perceptions about the job and environment when they are still teaching.

### **The 1999-2000 Schools and Staffing Survey**

The SASS was originally developed to gather data about teacher supply and demand when a teacher shortage began to emerge in the mid-1980s. Currently, the 2007-2008 SASS data collection is under way. The SASS provides policy makers and researchers a uniquely valuable dataset for describing and tracking the contexts of teaching and schooling, and teachers' careers in the U.S.

The 1999-2000 SASS surveyed a sample of public schools from the 1997-98 Common Core of Data (CCD) that were selected to be representative at the national and state levels, as well as a sample of private schools on the 1997-98 Private School Survey (PSS). In addition, the 1999-2000 SASS includes all public charter schools that were open in 1998-1999 and still open in 1999-2000, as well as the entire cohort of Bureau of Indian Affairs (BIA) schools operating in 1997-1998 (Gruber, Wiley, Broughman, Strizek, & Burian-Fitzgerald, 2002).

The SASS employs a nationally representative complex random sample design; schools are first stratified by state, sector, and school level and randomly sampled within strata, and within each selected school, teachers are randomly selected based on the school size. Analyses of sample survey data based on a stratified sample design must use appropriate case weights to correct for the unequal probabilities of selection. This will reduce the biases in means and totals. Using stratified sampling, the 1999-2000 SASS surveyed approximately

15,500 principals or school heads and 77,000 teachers in public, public charter, private, and Bureau of Indian Affairs schools and 5,700 public school districts.

Data collection was conducted by the U.S. Census Bureau, which began by sending advance letters to the selected schools in September 1999. Questionnaires were mailed to the schools in October with a postcard reminder as a follow-up several weeks later. Non-responding teachers were followed up using Computer-Assisted Telephone Interviewing (CATI) (Gruber et al., 2002). The final weighted response rate for public, private, public charter teachers was 81.2%, 74.9%, and 78.7%, respectively. Tables 3.1 and 3.2 respectively, present summaries of the numbers of teachers and schools selected to participate and their weighted response rates (Gruber et al., 2002).

Table 3.1 Number of Selected Teachers and Response Rates

<b>Sector</b>	<b># Surveys Sent to Teachers</b>	<b># In Scope Teacher Cases<sup>1</sup></b>	<b># Complete Teacher Interviews<sup>2</sup></b>	<b>Unweighted Teacher Response Rate<sup>3</sup></b>
Public	56,354	51,811	42,086	81.2%
Private	10,760	9,472	7,098	74.9 %
Charter	4,438	3,617	2,847	78.7%
Total	71,552	64,900	52,031	

Table 3.2 Number of Selected Schools and Response Rates

<b>Sector</b>	<b># Surveys Sent to Schools</b>	<b># In Scope School Cases<sup>1</sup></b>	<b># Complete School Interviews<sup>2</sup></b>	<b>Unweighted School Response Rate<sup>3</sup></b>
Public	9,893	9,527	8,432	88.5%
Private	3,558	3,233	2,611	80.8%
Charter	1,122	1,010	870	86.1%
Total	14,573	13,770	11,913	

- Notes: 1. To be considered in-scope the selected school must still have been operational and the teacher still employed by the selected school at the time the survey data was collected.  
 2. The number of complete interviews is the unweighted number of in-scope cases that responded to enough items to be considered a valid respondent.  
 3. Unweighted response rates are defined as the number of complete interviews divided by the number of in-scope sample cases.

### **The 2000-2001 Teacher Follow-up Survey**

TFS is designed to track a sub-sample of SASS teachers (including a sample of

teachers who actually left teaching) about their subsequent employment, teaching status, and job perceptions one year after the original SASS data were collected. TFS data can contribute to a better understanding of teachers' careers, the reasons teachers give for leaving the profession, where former teachers go after leaving teaching, and how teaching fits into longer term careers. TFS stratified a sample from all the teachers who responded to the SASS a year before based on such characteristics as school type, level, and years in teaching. For the 2000-2001 TFS data collection, approximately 8,300 teachers were originally selected. Approximately 3,300 stayers, 2,200 movers, and 2,800 leavers were included in the initial 2000-01 Teacher Follow-up Survey sample. A questionnaire for former teachers was mailed to leavers, while stayers and movers were mailed a separate questionnaire for current teachers. The unit survey response rate for the TFS was 90 percent for 4,384 current teachers and 89 percent for 2,374 former teachers (Chandler, 2004).

### **Analytic Sample**

This study used a restricted sample of 1,563 K-12 public, full-time teachers. The 1999-2000 SASS public school teacher data consists of 52,404 observations, including 2,847 public charter school teachers and 373 BIA school teachers. The companion 2000-2001 TFS consists of two datasets; the first with responses from 4,384 current teachers and the second with responses from 2,374 former teachers. The analytic data for the study were extracted from the SASS and TFS through several steps.

Table 3.3 The TFS Final Teacher Status Matched with the SASS

<b>Categories</b>	<b># of Teachers</b>	<b>Percent</b>
Former teachers in TFS (Leavers)	1,679	40.4
Current teachers in TFS		
Respondents are teaching at another school (Movers)	946	22.8
Respondents are still teaching at same school (Stayers)	1,531	36.8
<b>Total</b>	<b>4,156</b>	<b>100.0</b>

Note: The 2000-2001 TFS asked both former teachers and current teachers about their current status of teacher turnover as a sampling variable (STATUS). Figures in this tables were based on a sampling variable (STATUS) created by NCES.

First, the TFS samples of former and current teachers were combined into a sample of 6,758 teachers. Next, 4,156 public school teachers among them were matched with cases in the 1999-2000 SASS data. Among these 4,156 teachers, 2,477 were current teachers and 1,679 were former teachers (See Table 3.3).

### Stayers

Among the 2,477 current teachers surveyed, “stayers” were defined as teachers who were teaching in the same school where they were when they responded to the SASS one year earlier. There were 1,531 of them. Nine hundred forty six teachers (“movers”) were removed from the sample since I expected the job satisfaction and intention to leave responses of these teachers the year before they changed schools to be different than those who decided to stay. Moreover, it is possible that movers left jobs in one district for higher paying jobs in a second district or left jobs in one school for better working conditions in a second school in the district, a condition that would likely distort the observed relationships between salary and working conditions and job satisfaction or intention to leave among stayers if they were left in the sample.

Table 3.4 Classification of Stayers by Main Assignments

Categories	# of Teachers	Percent
Regular full-time teacher	1,343	87.7
Regular part-time teacher	57	3.7
Itinerant teacher	73	4.8
Long-term substitute	12	.8
Administrator (e.g., principal, assistant principal)	6	.4
Library media specialist or librarian	7	.5
Other professional staff (e.g., counselor)	33	2.2
Total	1,531	100.0

Note: Figures in this table was based on the SASS item (T0051 “How do you classify your main assignment at this school, that is, the activity at which you spend most of your time during this school year?”)

Among the 1,531 stayers, those who worked as a regular part-time teacher, itinerant teacher, administrator, librarian, substitute, etc. were excluded from the sample (n=188) since

it may be difficult for part-time teachers to take full advantage of salary and professional training opportunities (See Table 3.4). The study also omitted two teachers whose academic base salary was in excess of \$100,000, deeming them outliers.<sup>6</sup> Thus, the final sample of stayers was 1,341 teachers.

### Leavers

Among the 1,679 former teachers surveyed, “leavers” were defined as teachers who left teaching to work in an occupation outside the field of education. The sample did not include 291 teachers who left their teaching position to work in another elementary or secondary education occupation (e.g., administrators, counselors, curriculum coordinators). In addition, 140 teachers who left teaching in an elementary or secondary school to work in an education occupation outside the elementary or secondary levels were not included (e.g., postsecondary instructors).<sup>7</sup>

Table 3.5 Occupational Status of Former Teachers in the TFS

Categories	# of Teachers	Percent
Working IN an elementary or secondary education occupation	291	17.3
Working in an education occupation OUTSIDE of elementary or secondary education	140	8.3
Working in an occupation outside the field of education	263	15.7
Student at a college or university	70	4.2
Caring for family members	182	10.8
Retired	650	38.7
Disabled	20	1.2
Unemployed and seeking work	26	1.5
Other	37	2.2
Former teachers in TFS	1,679	100.0

Note: The 2000-2001 TFS asked both former teachers and current teachers about their current status of teacher turnover as a sampling variable (STATUS). Figures in this tables were based on a sampling variable (STATUS) created by NCES.

<sup>6</sup> The average base salary of teachers in the sample was \$37,769. Z-scores for the amount of the salary that two teachers received were more than 7, indicating possible outliers.

<sup>7</sup> What factors affect teachers’ decisions to change their jobs within the education sector could be a topic of future study.

These two groups were discarded from the sample. I also omitted from the final leavers sample those teachers who reported that they left teaching to become a college student (n=70), care for a family member (n=182), and retire (n=650). “Leavers” were the remaining 263 teachers who responded that they left teaching to work in an occupation outside the field of education (See Table 3.5).

I excluded regular part-time teachers, itinerant teachers, and substitute teachers (n=41) from the leaver sample. As indicated in Table 3.6, I used data from 222 leavers who worked as regular full-time teachers the year before they left teaching (the 1999-2000 school year).

Table 3.6 Classification of Leavers by Main Assignments

Categories	# of Teachers	Percent
Regular full-time teacher	222	84.4
Regular part-time teacher	14	5.3
Itinerant teacher	13	4.9
Long-term substitute	6	2.3
Administrator (e.g., principal, assistant principal, director)	2	.8
Library media specialist or librarian	2	.8
Other professional staff (e.g., counselor, curriculum coordinator)	4	1.5
Total	263	100.0

Note: Figures in this table was based on the SASS item (T0051 “How do you classify your main assignment at this school, that is, the activity at which you spend most of your time during this school year?”)

All told, the resulting sample of 1,563 full-time public school teachers consisted of 1,341 stayers who continued teaching at their schools and 222 teachers who left teaching altogether in the 2000-2001 school year. The basic characteristics of the sample are summarized below.

### Sampling Weights

The sample in the study is taken from a complex sample survey design that includes stratification, clustering (the selection of teachers within each school), and over-sampling of teachers with certain characteristics (e.g., new teachers and bilingual teachers) to ensure that the samples of these teachers are large enough to produce reliable estimates. In surveys with complex sample designs, direct estimates of the sampling errors based on the assumption of

simple random sampling will typically underestimate the sampling variability in summary statistics and distort tests of statistical significance (Hahs-Vaughn, 2005; Thomas & Heck, 2001).

In order to compensate for this bias, the weights (TFNLWGT) assigned by NCES were used in all data analyses to produce unbiased population estimates. The weights are inversely proportional to the probability of selection. Weights depend on both the sampling plan and the conceptual orientation of the study, so using the teacher level weights seems appropriate for both the sampling plan as designed by NCES and for this study, which focuses on teacher level inferences. In addition, given the relatively small size of the analytic sample compared with the larger SASS sample, employing sampling weights makes the data-analysis results generalizable to the population of the nation's entire K-12 public school system full time teachers except those who were excluded from the analytic sample. The recent version of the LISREL program supports structural equation modeling with data from complex sampling designs (Stapleton, 2006).

### **Discussion of the Constructs and Indicators**

The data analysis of this study includes exploratory and confirmatory factor analyses designed to test and refine the proposed variables. Before any factor analytic measurement work was done, items representing each of the constructs of interest were selected from the survey based on theories and previous studies discussed earlier. While some of the operational definitions may change based on the results of factor analytic work, this stage of the study contained all possible items for each of the constructs. The specific items used in the study from the SASS and TFS are summarized in the Appendix A, together with the original survey questionnaire.

### **Job Satisfaction**

From the SASS, two questions relevant to perceptions of job satisfaction were

selected as indicators for job satisfaction; these have been used in other studies using the 1994-1995 SASS (Ingersoll et al., 1997; Perie & Baker, 1997). The first question asked teachers to report their overall job satisfaction (“I am generally satisfied with being a teacher at this school”) on a four point Likert scale (1=strongly agree to 4=strongly disagree). This item is newly included in the 1999-2000 SASS and is most consistent with the definition of teachers’ job satisfaction used in this study. The second question asked about teachers’ feelings about wasting their time trying to do their best (“I sometimes feel it is a waste of time to try to do my best as a teacher”) and has a four point Likert scale (1=strongly agree to 4=strongly disagree).

### **Turnover Intention**

Turnover intention is a variable representing current teachers’ possible decisions to quit in the future. To measure the construct of turnover intention, this study used the SASS item with five response options, i.e., “how long do you plan to remain in teaching?”: (1) as long as I am able, (2) until I am eligible for retirement, (3) will probably continue unless something better comes along, (4) definitely plan to leave teaching as soon as I can, and (5) undecided at this time. Like some studies (Sentovich, 2004; Stockard & Lehman, 2004), this study placed the fifth response option of “undecided at this time” between “will probably continue unless something better comes along” and “definitely plan to leave teaching as soon as I can”. The other SASS question asked teachers “if you could go back to your college days and start over again, would you become a teacher or not?” and has five potential responses: (1) certainly would become a teacher, (2) probably would become a teacher, (3) chances about even for and against, (4) probably would not become a teacher, and (5) certainly would not become a teacher. These two indicators for teacher turnover intention were reversely recoded for interpretation.

## **Actual Turnover**

The 2000-2001 Teacher Follow-up Survey asked both former teachers and current teachers about their current employment status. While some studies have also looked at inter-school/inter-district teacher turnover (Betts et al., 2000; Lankford et al., 2002), this study only included those who left teaching (“leavers”) and those who remained (“stayers”), i.e., it excluded those who remain in teaching but move to another school (“movers”). This was because the study was interested in who decided to leave teaching overall, which directly influences teacher demand and supply. As discussed earlier, factors affecting teachers’ turnover decisions (e.g., salary, working conditions) are likely to be different between stayers and movers.

## **Salary**

Salary is a latent independent variable (an exogenous variable) referring to the value of a teacher’s academic base salary and the actual yearly dollar amount that a teacher makes from work as a teacher. Some studies have included teacher’s salary as a component of working conditions (Loeb et al., 2005), but this study examined separately the impacts of salary and working conditions in one model in order to tease out the relationships between salary and other constructs. The construct of salary in the study includes the academic base salary, additional income from extra activities related to teaching in a school, and rewards and bonuses from the school or district.

It is assumed in this study that higher salary does not necessarily mean higher satisfaction with the salary; other factors such as the amount and difficulty of the work and the degree of perceived support for professional development, and the qualifications and capabilities a person possesses also contribute to the formation of such satisfaction.

## **Working Conditions**

The construct of working conditions in the study conveys the perceived totality of

non-pecuniary elements that surrounds a teacher's job that could either make teaching more effective or more difficult.<sup>8</sup> The SASS asked teachers a number of questions about teaching experiences related to working conditions and decision-making at their schools. These include a series of questions related to interactions with administrators and colleagues, hours spent at teaching assignment, job safety, a series of questions about teacher influence over school policy and control in their classroom, whether or not they agree with certain statements about their teaching experience, and to what extent a number of conditions are problems at their schools.

Based on the literature review, this study first considered components of working conditions that are more likely to be enhanced by a policy intervention. The pre-selected questions were used to extract factors representing the teacher's perceived working conditions in his/her school through factor analysis.

Specifically, a series of 18 questions asked teachers whether they agree or disagree with a number of statements about their principal, the administration, their students, fellow teachers, and school conditions. All these items use a four-point scale ranging from 1=strongly agree to 4=strongly disagree, which would be reverse recoded later. These include some questions that concerned administrative support or school climate (Ingersoll, 1999); for example, "the principal lets staff members know what is expected of them," "the school administrator's behavior toward the staff is supportive and encouraging," and "my principal enforces school rules and backs me up when I need it."

In addition, some items indicate whether colleagues share the respondent's beliefs and values about the central mission of the school, there is cooperative effort among staff, the respondent plans cooperatively with media services, and the respondent coordinates course content with other teachers (e.g., "rules for student behavior are consistently enforced by teachers in this school, even for students who are not in their classes," "most of my

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<sup>8</sup> Indicators for working conditions that make teaching more difficult were reverse recoded.

colleagues share my beliefs and values about what the central mission of the school should be,” “there is a great deal of cooperative effort among the staff members”). In relation to student behavior, teachers were asked about whether student tardiness, class cutting, and misbehavior interfere with teaching, with the same four-point ‘strongly agree’ to ‘strongly disagree’ response options.

Another series of 18 questions asked teachers to what extent each of the following is a problem in this school; for example, “student tardiness,” “students cutting classes,” and “student’s disrespect for teachers.” These questions use a four-point response options from 1=serious problem to 4=not a problem.

A series of seven questions asked teachers about how much influence they have over school policy in seven different areas, with a range from 1=no influence to 5=great influence. These concerned setting performance standards, establishing curriculum, determining the content of in-service professional development, evaluating teachers, hiring new teachers, setting discipline policy, and deciding how the school budget will be spent. In addition, six questions with a five-point scale ranging from 1=no control to 5=complete control were asked to allow teachers to rate how much control they have in their classroom over planning and teaching in six areas; selecting instructional materials, selecting what to teach, selecting teaching techniques, evaluating students, disciplining students, and assigning homework.

In relation to assigned work load, the SASS includes four questions that asked teachers to rate how many hours were spent at their teaching assignment, including assigned teaching, planning, and other school related activities. In addition, there are two questions that asked how many tardy students they have in their classes and how many times they had to interrupt classes to deal with student misbehavior or disruption. In relation to job security, there are two questions that asked teachers how many times they were threatened or physically attacked by students.

## **Professional Training Experiences**

Teacher professional training experiences refers to teachers' perceptions of participating in systemic and organized plans or activities to improve professional competency by increasing subject knowledge and instruction skills for all age group of teachers. The 1999-2000 SASS data includes a total of 37 questions about types of professional development activities, their usefulness, and types of support and rewards the teacher received. For further analysis, I created some composite variables with types of activities that teachers participated in, supports and rewards.

Specifically, 9 items with a yes-no response option asked teachers about whether they participated in certain types of professional development training activities or not. Furthermore, the SASS asked teachers about 6 specific professional training activities in their main teaching assignment: (1) in-depth study of the content, (2) content and performance standards, (3) methods of teaching, (4) computer use for instruction, (5) student assessment, and (6) student discipline and class management. For each topic, teachers were asked whether they joined such activities (yes-no response options), how many hours they participated (a four-point scale), how they perceived the usefulness of such activities (a five-point scale) and the overall usefulness of all activities in which they participated (a five-point scale).

In addition, the SASS asked if they received any of the following kinds of support: (1) release time from teaching, (2) scheduled time in the contract year for professional development, (3) stipends for professional development activities, (4) full or partial reimbursement of college tuition, (5) reimbursement for conference or workshop fees, and (6) reimbursement for travel and/or daily expenses. Teachers were asked if they received any of the following kinds of rewards as a result of completing such activities: (1) credits towards re-certification or advanced certification, (2) increase in salary or other pay increases, and (3) recognition or higher ratings on an annual teacher evaluation.

## **Teacher and School Characteristics**

Teacher and school characteristics were considered in order to examine interaction effects, i.e., how the associations of each construct differ depending on teacher characteristics and school characteristics. Most of the teacher and school characteristics used in the study were selected based on earlier studies. Teacher background characteristics included gender, race/ethnicity, year of teaching experience, degree, and certification, which are discussed in most of the earlier literature. In addition, school level variables included school level, location, school size, student-teacher ratio, percent of minority students, and percent of LEP students.

### **Statistical Technique: Structural Equation Model Approach**

This study employed a structural equation modeling (SEM) approach as the major statistical technique to analyze the hypothesized relationships. SEM starts with a hypothetical model, which is transformed into a path diagram. It does not only allow researchers to analyze a set of latent variables much like independent and dependent variables in regression analysis, but also provides a comprehensive means for assessing and modifying hypothesized models.

The major advantages of SEM are that it allows simultaneous equation estimation that assesses both measurement issues and causal relationships in one model and the use of path analysis that statistically and visually illustrates complex relationships among variables (Bollen, 1989; Kline, 2005). Thus, SEM provides the researcher with an opportunity to adopt a more holistic approach to model building. Most alternative procedures that might be used in place of SEM (e.g., multiple regression) would provide only separate mini-tests of model components that are conducted on an equation-by-equation basis (Tomarken & Waller, 2005).

More specifically, SEM is useful to examine direct and indirect relationships between one or more independent variables and one or more dependent variables, when a dependent

variable in one equation becomes an independent variable in another equation (Hair, Anderson, Tatham, & Black, 1998). Another well-known feature is that SEM can accommodate the bias in the estimates due to the measurement error associated with imperfect measures in social science data by using multiple indicators for all latent variables. As a result, SEM can provide more precise parameter estimates and increased statistical power. On the contrary, multiple regression analysis assumes that all constructs are free of measurement error, though social-science data frequently are measured with error.

Moreover, SEM estimates indirect effects as well as direct effects among latent variables that allow for the estimation of the total effect, while in multiple regression an indirect effect is commonly overlooked when a hypothesized direct effect is insignificant and then the variable or relationship is completely dismissed. The path diagram in the SEM helps to clearly present the direction of each effect and the correlations among all variables in one complete picture (Hair et al., 1998; Kline, 1998). For all these reasons, SEM is suitable for an examination of interrelationships among salary, working conditions, and teacher professional training experiences that directly or indirectly influence job satisfaction, turnover intention, and actual turnover in the profession.

### **Model Specification**

A structural equation modeling has proven to be a successful analytical framework for complex, interrelated, multidimensional models, and is valuable for measuring a moderating variable (Tomarken & Waller, 2005). It also provides a way to determine relative variable strength or importance and simultaneously scrutinize theoretical models.

The general form of a structural equation model consists of two parts: the measurement model and the structural model. The measurement model first specifies the relationships among latent variables (unobserved variables or constructs) and their indicators (observed variables or manifest variables), i.e., how the latent variables are measured in terms

of the observed variables, including description of the measurement properties (validity and reliability) of the observed variables (Kline, 1998). This is obtained through confirmatory factor analysis (CFA). The CFA is used to define latent constructs that are indicated by measured variables.

The structural model then specifies the relationships among the latent variables, and describes the causal effects and the amount of unexplained variance. The latent variables could be either endogenous or exogenous, and each has its own measurement equation. While exogenous latent variables act only as predictors or causes for other latent variables in the structural model, endogenous latent variables are the dependent or outcome variables in at least one causal relationship. Figure 3.1 shows a hypothesized structural model for relationships among the latent variables in the study.

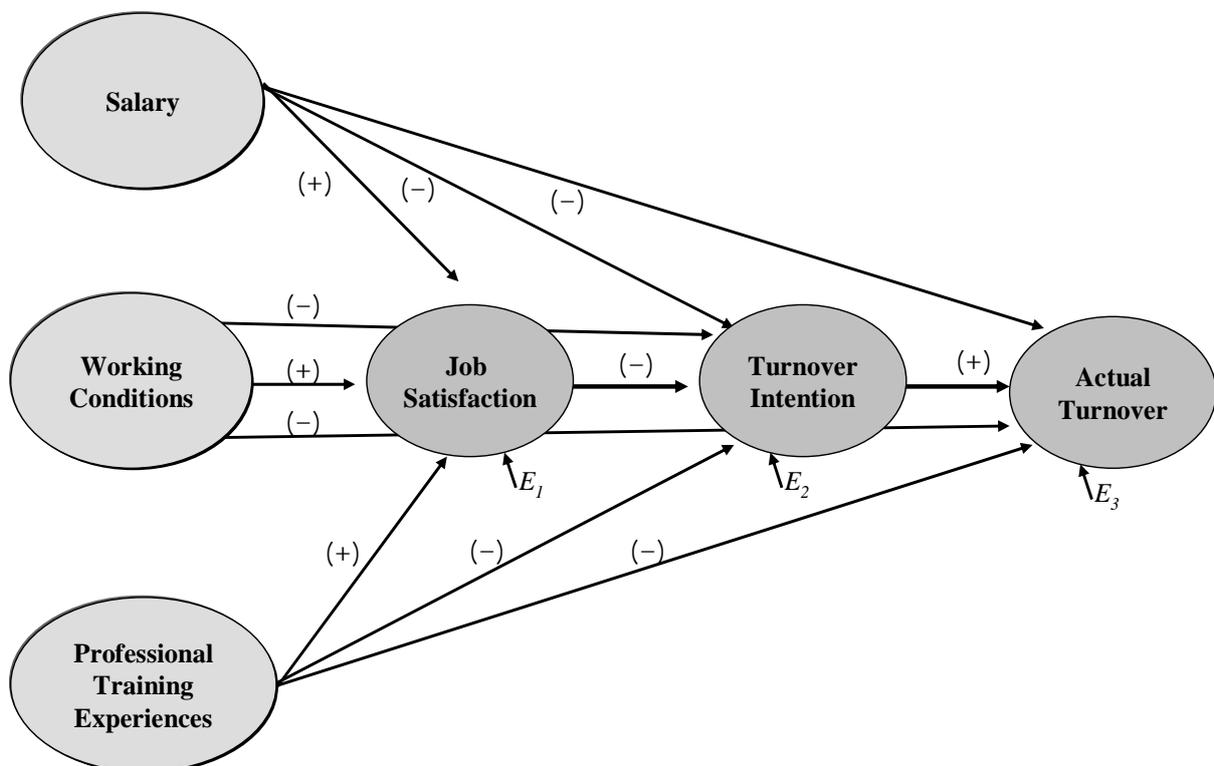


Figure 3.1 A Hypothesized Structural Model

In the model for this study, three exogenous latent variables (i.e., salary, working conditions, and professional training experiences) were identified as independent variables, each with its own measurement equation. Job satisfaction, turnover intention, and actual turnover were predicted by the three exogenous variables. Simultaneously, actual turnover was predicted by turnover intention and turnover intention was predicted by job satisfaction. It is assumed that the errors of the endogenous variables are uncorrelated.

The proposed structural model can be summarized as follows:

$$\text{Job satisfaction} = f(\text{Salary}, \text{Working conditions}, \text{Professional training experiences}, E_1)$$

$$\text{Turnover intention} = f(\text{Job satisfaction}, \text{Salary}, \text{Working conditions}, \text{Professional training experiences}, E_2)$$

$$\text{Actual turnover} = f(\text{Turnover intention}, \text{Salary}, \text{Working conditions}, \text{Professional training experiences}, E_3), \text{ where } E_i \text{ is a vector of all other factors not included in the model, or an error term.}$$

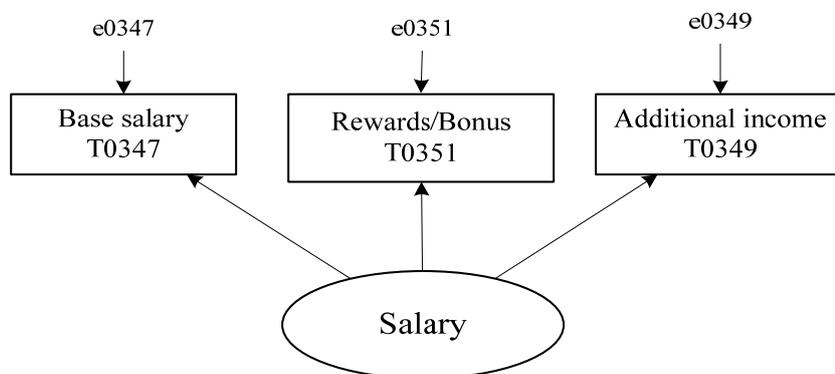


Figure 3.2 A Measurement Model for the Construct of Salary

Furthermore, the construct of salary was a latent independent variable. Figure 3.2 displays a possible measurement model for the construct of salary.<sup>9</sup> Measured variables (indicators, or observed variables) were presented in squares with their error variances and

<sup>9</sup> Each of the measurement models for the exogenous variables was established after conducting confirmatory factor analysis.

latent variables (constructs) in large circles. An arrow indicates a hypothesized directional relationship between the variables. It is assumed that errors of measurement associated with each observed variable are uncorrelated.

The construct of working conditions consisted of several components such as administrators’ attitudes, student behaviors, parental support, and other environmental factors. The selection of the exact items was based on the results of exploratory factor analysis. Figure 3.3 displays a possible measurement model for the construct of working conditions. Elongated ovals indicate factors extracted from factor analysis and each factor has its own measurement model, not all are shown for simplicity.

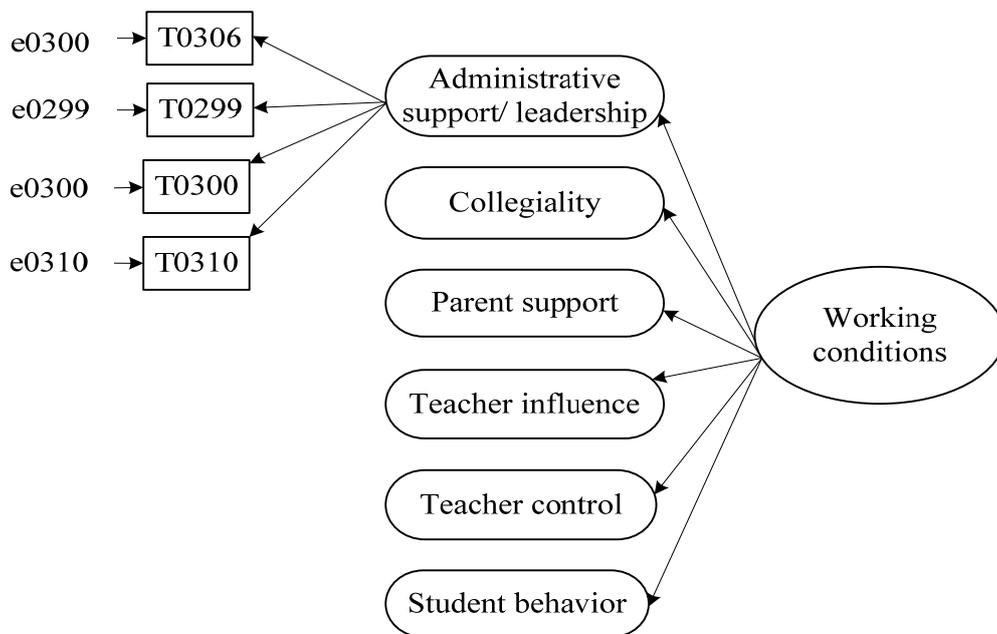


Figure 3.3 A Measurement Model for the Construct of Working Conditions<sup>10</sup>

The construct of teacher professional training experiences reflected participation in professional development programs. Procedures for the measurement model for this construct follow the same procedure used with the working conditions. Figure 3.4 shows a possible measurement model for the construct of professional training experiences.

<sup>10</sup> Due to space limits, this figure does not include all of the observed variables and corresponding measurement error variances.

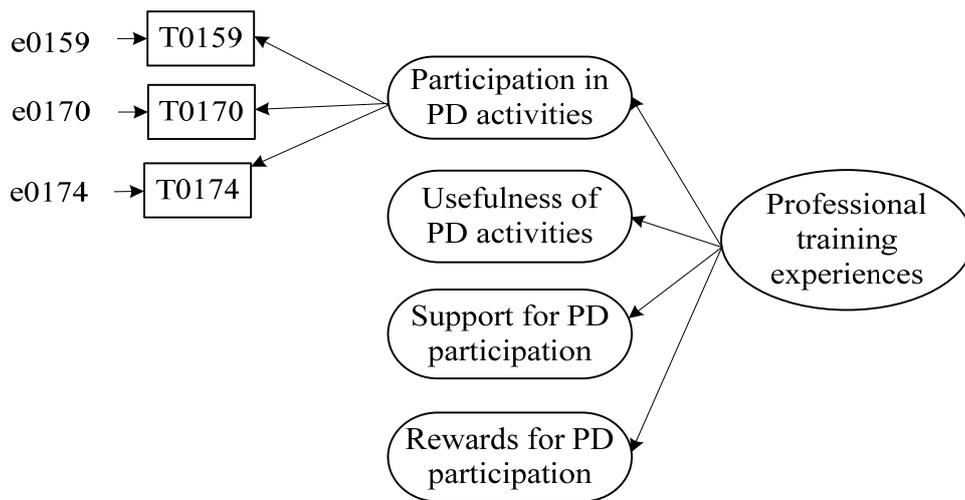


Figure 3.4 A Measurement Model for Professional Training Experiences

### Data Analysis Procedures

The research was designed to identify the relative importance of salary, working conditions, and teacher professional training experiences on job satisfaction, turnover intention, and actual turnover behavior, and to examine whether teacher and school characteristics play a role in these relationships. For these purposes, a structural equation model building approach including multi-group analysis was employed as the major statistical method. Several statistical steps were taken to prepare the data for the main SEM analyses. These steps for structural equation model building included preliminary and descriptive analysis as well as exploratory and confirmatory factor analysis.

### Preliminary and Descriptive Analysis

A preliminary analysis was conducted to validate the questionnaire items and subscales that had been chosen to represent several latent variables. Pre-selected variables were initially examined to detect possible outliers that may affect the goodness of the model fit, using bivariate scatter plots and histograms.

In addition to preliminary analyses, the original coding of the raw data was

thoroughly inspected to identify questions with reverse direction wording that could misrepresent the true effects of certain variables and jeopardize the parameter estimation and model fit. Two types of questions in the data called for special attention in recoding before statistical analysis could be performed. The first type is the yes-no questions. The dataset originally coded the answers as either a 1 or 2. The researcher recoded them into 1 and 0 to ensure alignment with subscales of other variables. The second type is questions that use “agree-disagree” response choices, ranging from strongly agree to strongly disagree (numbered 1 to 4). For example, one question states “the school administrator’s behavior toward the staff is supportive and encouraging” and another states “the amount of student tardiness and class cutting in this school interferes with my teaching.” A lower value of the first question indicates a favorable condition, while this is reversed in the second question. Throughout the whole dataset, questions were recoded in such a way that a lower value answer would consistently indicate a less favorable condition and a higher value would indicate a favorable condition (See Appendix A).

Basic descriptive analysis was also performed to grasp the overall data structure of each variable and demographics of teachers and schools, using frequencies, means and standard deviations. At the same time, cases with missing data, if any, were excluded because the sample size was sufficiently large after inspection of any systematic missing value.

### **Exploration of Factor Structure of Indicators and Constructs**

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted in order to condense the large number of variables to a more manageable number and explore factor structure of indicators and constructs. EFAs were first performed on a pre-selected set of variables associated with the main constructs. Factor analysis helps reveal underlying factors that can explain the pattern of correlations among a set of observed variables and assist in identifying what the factors represent conceptually.

Through CFAs, observed variables within each prominent factor were tested for their significance and appropriate placement. Reliability coefficients were also calculated for each group of variables, which serve as indicators for the measurement equation in SEM. Whether the initially hypothesized measurement model was accepted or revised was determined based on the model evaluation. Composite scores were used to simplify the overall structural equation model and avoid confusing over-crowding of the path diagram. For example, the working-condition factors extracted and confirmed through EFA and CFA were in turn, used as observed variables for working conditions in the next analysis step.

The following guidelines were employed in making decisions about including items in subscales. In general, items with loadings of .40 or above in the exploratory factor analysis were considered for inclusion of a subscale (Hair et al., 1998; Ingersoll, 2001). Cronbach's alpha values of .6 and above for each full scale were considered as acceptable. For model fit assessment in the confirmatory models and full structural equation model in the next step, both  $\chi^2$  (chi-square) tests and a group of descriptive goodness-of-fit indices were consulted. The chi-square fit index is highly sensitive to sample size and the hypothesized model is likely to be rejected when the sample size is large, even though the discrepancy between the sample correlation/covariance matrix and model-predicted correlation/covariance matrix may be small or trivial (Fan, Thompson, & Wang, 1999; Fan & Wang, 1998). For this reason, several widely used descriptive fit indices were used to assess model fit. These include the root mean square error of approximation (RMSEA)<sup>11</sup> and the normed chi-square ( $\chi^2/df$ ), which are relatively independent of sample size. RMSEA values of .05 or less, as a rule of thumb, were considered as indicating a good fit (Cudeck & Browne, 1993; Hoyle, 1995)<sup>12</sup> and the normed chi-square values less than 5 were considered to be acceptable (Kline, 2005).

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<sup>11</sup> A recent LISREL version only provides RMSEA for the model fit index when sampling weights are applied.

<sup>12</sup> Hu and Bentler (1999) posit a cutoff of close to .06 to show good fit. Browne and Cudeck (1993) reported that RMSEA values less than .08 indicate an adequate model fit and less than .05 indicate a good fit.

All structural equation modeling analyses were conducted using LISREL 8.7 with the maximum likelihood method of estimation.<sup>13</sup>

### **Establishment of the Measurement Model**

Based on the results of screening of factor structure of indicators and constructs, the measurement model was explored. The goodness-of-model fit of measurement model was evaluated with similar criteria used in exploring factor structure of variables. Validity and reliability of constructs were assessed. The confirmed measurement model was incorporated into the structural model.

The hypothesized full model was used to test relative weights of salary, working conditions, and professional training experiences and to examine possible mediating effects of job satisfaction and turnover intention. Particularly, to examine the mediating effects of job satisfaction and turnover intention on the associations among constructs, one baseline model and its two nested models (full mediation model and model without mediation) were compared and evaluated using a chi-square difference test between the models.

### **Multi-group Analysis**

Through the results of relative weights and mediating effects, constructs and indicators were selected to build a final full structural model to be used for multi-group analysis as a baseline model. In each step, model parameters of the full model were then estimated and the fit of the model to the data was assessed based on goodness-of-fit, as discussed above. The acceptability of the final structural model was decided based on the results of these model evaluations. If the model was not acceptable, it was further revised based on theoretical credibility and modification indices.

In order to test whether interrelationships among constructs differ across subgroups

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<sup>13</sup> A potential problem with the maximum likelihood estimation is the assumption of multivariate normality. The researcher is not as concerned about this issue as he might have been with a smaller sample because maximum likelihood tends to be more robust with large sample sizes.

specified by characteristics of teachers and schools, multi-group analysis was conducted. The procedures for multi-group analysis using LISREL were guided by Joreskog and Sorbom (1993). For multi-group analysis, it is necessary to establish adequate baseline models for each group (Byrne, 1998). The model fit of the data was assessed with the same indices and criteria discussed above.

Multi-group analysis for both the measurement model and structural model was conducted using the following logic: First, I estimated separate baseline models for each group to identify the best fitting model for each group. Once these baseline models for each group were established, multi-group analyses were performed by comparing the relevant parameters across groups using chi-square difference tests. Second, I estimated a joint, unconstrained model for all groups (i.e., coefficients were allowed to vary freely across groups). Third, I estimated a joint constrained model where the parameters across groups are constrained to be equal to each other. Fourth, I compared the fit of the constrained model with that of an unconstrained one using the difference in chi-square statistic with a significance level of .05. If the chi-square difference statistic does not reveal a significant difference between the unconstrained and constrained models, then we can conclude that the constrained model applies across groups. If the chi-square statistic reveals a significant difference between the unconstrained and constrained models, then modification indices were used to partially remove the constraints (i.e., pinpoint where the differences were).

Specifically, the equality of the measurement model was first tested with comparisons of the nested models. In fact, this step includes a series of tests in a sequential manner. First, it began with a test of whether the variance-covariance matrices were different across groups under comparison. The following tests should be conducted only if the variance-covariance matrices are not equal across groups. Second, whether the groups have the same factor structure was tested, which was followed by a test of whether the measures indicate the factors in a comparable way (the invariance of factor loadings). Given equal factor loadings,

the test of structural paths among the latent variables is meaningful.

Given the same factor loadings across groups, one can investigate whether structural relationships are invariant by chi-square difference tests between nested models. Only if the chi-square difference between the unconstrained and constrained model was significant, further investigation allowed to pinpoint which structural paths show a significant difference. Modification indices indicate possible structural relationships that can be unconstrained and then improve model fit of the data.

For example, modification indices indicated unconstraint of a structural path from salary and turnover intention for the improvement of the model fit between male teachers and female teachers. Comparisons of the chi-square statistic and model fit indices between the unconstrained model and the partially constrained model (unconstrained path from salary to turnover intention) was made. The difference in chi-square values with one degree of freedom was used as a criterion to reject the null hypothesis that the structural coefficient was invariant across groups. The rejection of this hypothesis means that the structural coefficient is not equal between male and female teachers. This indicates that salary impacts turnover intention differently depending on the gender of the teacher.

## **Descriptive Results**

### **Teacher Characteristics**

Table 3.7 summarizes the basic characteristics of the sampled teachers by their final teacher status (i.e., “stayers” and “leavers”). Overall, 14.2% and 5.1% of the teachers in the unweighted and weighted sample left teaching, respectively. The turnover rate in the sample was lower than that reported in other studies (Ingersoll, 2001; NCATF, 2003). This may be due to the exclusion from the sample teachers who left teaching for reasons of retirement, health issues, and to work in other jobs in education.

The majority of teachers in the analytic sample were female (77.8%) and white (82.2%), had a bachelor's degree (62.0%), a regular/standard state certificate (80.8%), and more than 3 years of teaching experience (68.4%). Higher percentage of male teachers (10.6%) left teaching compared to female teachers (3.6%) - a finding which is inconsistent with some previous studies (Ingersoll, 2001; Stinebrickner, 2001; Weiss, 1999).<sup>14</sup>

White teachers (5.6%) were more likely to leave teaching than their Black (2.2%) and Hispanic (3.8%) counterparts. Asian teachers had a slightly higher attrition rate than White (5.9%). This partially supports some previous studies suggesting that white teachers tend to have higher turnover rates than minority teachers (Adams, 1996; Ingersoll, 2001).

Teachers with bachelor's degrees had a slightly higher attrition rates (5.1%) than those with master's degree (4.9%), as do teachers with "no bachelor's degree" (48.6%) or a "doctorate" (15.3%) though the percentages of teachers with "no bachelor's degree"(.2%) and doctoral degrees (.4%) were small.

Regarding subject area, teachers of vocational/technical subjects (15.8%) had much higher attrition rates than science teachers (10.7%), English teachers (9.2%), and math teachers (6.6%) – a finding that challenges the existing literature that found higher attrition rates among math and science teacher than in other subject specialties (Weiss, 1999).

Concerning their qualification status, 80.8% of the sampled teachers reported having regular or standard state certification, including advanced professional certification, while 6.9% reported having no certification and 12.3% reported having some types of probationary, provisional, or emergency certification. In addition, a higher percentage of teachers with non-regular certificates (7.5%) left teaching than their counterparts with regular or standard certificates (4.6%).

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<sup>14</sup> It may not be surprising considering that average age of the female teachers in the leavers is about 40 years (39.77) and some studies have reported that mid-aged female teachers have a much lower turnover rate than younger or older female teachers (Grissmer & Kirby, 1997; Ingersoll, 2001; Stinebrickner, 2002).

Table 3.7 Sample Distributions of Leavers and Stayers within Teacher Characteristics

Variables	All	Leavers	Stayers
<b>Observations</b>	Unweighted N=1,563	Unweighted N=222	Unweighted N=1,341
Weighted (N=237,530)	100 %	5.1 %	94.9 %
Unweighted (N=1,563)	100 %	14.2 %	85.8 %
<b>Gender</b>			
Female	77.8 %	3.6 %	96.4 %
Male	22.2 %	10.6 %	89.4 %
<b>Race</b>			
White	82.2 %	5.6 %	94.4 %
Black	8.4 %	2.2 %	97.8 %
Hispanic	7.3 %	3.8 %	96.2 %
Asian	1.5 %	5.9 %	94.1 %
American Indian	.5 %	.6 %	94.9 %
<b>Highest Degree</b>			
No Degree	.2 %	48.6 %	51.4 %
Bachelor	62.0 %	5.1 %	94.9 %
Master	37.4 %	4.9 %	95.1 %
Doctorate	.4 %	15.3 %	84.7 %
<b>Subject Area</b>			
Special Ed. Elementary	9.2 %	4.7 %	95.3 %
General Elementary	47.2 %	2.7 %	97.3 %
Mathematics	5.5 %	6.6 %	93.4 %
Science	5.1 %	10.7 %	89.3 %
English	7.3 %	9.2 %	90.8 %
Social studies	4.1 %	4.7 %	95.3 %
Vocational/Technical	3.2 %	15.8 %	84.2 %
Other	18.5 %	6.2 %	93.8 %
<b>Certification</b>			
No certificate	6.9 %	7.4 %	92.6 %
Not regular	12.3 %	7.5 %	92.6 %
Regular/standard	80.8 %	4.6 %	92.6 %
<b>New Teachers</b>			
3 years or less	31.6 %	6.5 %	93.5 %
More than 3 years	68.4 %	4.5 %	95.5 %
<b>Teaching Experience (Yrs)</b>			
Mean	11.71	10.27	11.9
SD	10.21	10.87	10.1
Min	1	1	1
Max	47	39	47
<b>Age</b>			
Mean	39.22	37.64	39.5
SD	11.21	11.50	11.0
Min	22	22	22
Max	87	66	74

- Notes: 1. Sample weight provided by the SASS teacher final weight (TFNLWGT) was used to tabulate all of the figures in this table.
2. The percentage was used for gender, race, and highest degree based on the 1999-2000 school year.
3. The mean was used for age and teaching experience based on 1999-2000 school year.
4. For certification, “not regular” includes types of certificates such as probationary, provisional, temporary, and emergency.
5. Statistical significance tests of classification for all of the discrete variables in teacher characteristics were performed using chi-square tests. All discrete variables in teacher characteristics were significant at the .05 level.

In addition, teachers who taught less than three years (6.5%) had a higher attrition rate than those who taught more than three years (4.5%). The average years of teaching experience was about 12 years, with a range of 1 to 47 years. Those who left teaching had slightly fewer years of teaching experience (10.27 years) than did those who stayed in teaching (11.9 years). The average age of the sampled teachers was about 39 years, with a range from 23 to 87. For those who left teaching the average age was 37.64, while the average age for those who remained was 39.5.

### **School Characteristics**

The majority of the sampled teachers worked at elementary schools (65.5%) and in the urban fringe of large or mid-size cities (53.3%), as indicated in Table 3.8. Teachers who taught at the secondary school level were more likely to leave teaching (8.8%) than those at the elementary level (3.2%), which is consistent with some studies (Kirby et al., 1999; Murnane et al., 1991). Teachers who worked at schools in rural areas had a higher attrition rate (7.9%) than their counterparts (4.5%).

The average student enrollments in schools where sampled teachers worked are about 750 students and the average student: Teacher ratio was about 16:1. The average percentage of minority students in schools in which the sampled teachers taught was 38.14%. The average percentage of limited English proficiency (LEP) students was 8.03%.

For the continuous teacher/school characteristics (e.g., age, total years of teaching experience), mean differences between leavers and stayers were tested with AM statistical software supporting estimation of appropriate standard errors for complex samples.<sup>15</sup> As shown in Table 3.9, no mean differences were significant at the .05 level.

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<sup>15</sup> AM is a statistical software package from the American Institute for Research. This software is useful to analyze large-scale datasets from complex samples (e.g., SASS, NAEP, NELS) from the National Center for Education Statistics. AM automatically provides appropriate standard errors for complex samples using a Taylor-series approximation. The software supports regression, probit, logit, cross-tabs, mean difference analyses, and other statistics. For more information about AM statistical software, see <http://am.air.org/>.

Table 3.8 Sample Distributions of Leavers and Stayers within School Characteristics

Variables	All	Leavers	Stayers
	Unweighted N=1,563	Unweighted N=222	Unweighted N=1,341
<b>School Level</b> (Weighted N=221,572)			
Elementary	65.5 %	3.2 %	96.8 %
Secondary	34.5 %	8.8 %	91.2 %
<b>Urbanicity of School</b> (Weighted N=221,572)			
Large or mid-size central city	28.6 %	4.5 %	95.5 %
Urban fringe of large or mid-size city	53.3 %	4.5 %	95.5 %
Small town/Rural	18.6 %	7.9 %	92.1 %
<b>Student Enrollments</b> (Weighted N=215,349)			
Mean	750.27	826.10	746.32
SD	521.68	654.00	513.56
Min	12	12	14
Max	5,123	3,533	5,123
<b>Student-Teacher Ratio</b> (Weighted N=215,349)			
Mean	16.01	16.84	15.96
SD	3.91	5.18	3.82
Min	1	3	1
Max	38	38	37
<b>Percent of Minority Students</b> (Weighted N=236,911)			
Mean	38.14	34.84	38.82
SD	33.83	28.70	34.07
Min	0	0	0
Max	100	100	100
<b>Percent of LEP Students</b> (Weighted N=186,831)			
Mean	8.03	9.18	8.02
SD	18.56	20.80	18.43
Min	0	0	0
Max	100	100	100

Notes: 1. Sample weight provided by the SASS teacher final weight (TFNLWGT) was used to tabulate all of the figures in this table.

2. Cases with missing values in student-teacher ratio, percent of minority students, and percent of LEP students were excluded.

3. Statistical significance tests of classification for all of the discrete variables in school characteristics were performed using chi-square tests. All discrete variables in school characteristics were significant at the .05 level.

Table 3.9 Results of Mean Difference for the Selected Teacher/School Characteristics

Teacher/ School Characteristics	Stayers	Leavers	Mean Difference	SE Difference	df	t statistic	p value < t
Age	39.3	37.64	1.66	1.284	1561	1.293	.196
Teaching Experience	11.791	10.278	1.523	1.277	1561	1.193	.233
Student Enrollments	746.323	826.104	-79.781	61.929	1439	-1.288	.198
Student-Teacher Ratio	15.962	16.840	-.879	.717	1439	-1.225	.221
Percent of Minority Students	38.323	34.843	3.480	3.61	1554	1.000	.318
Percent of LEP Students	8.023	9.180	-1.157	2.664	1294	-0.435	.664

Note: Weighted N=237,530, unweighted N=1,563

## Turnover Intention

To measure teacher turnover intention, two questions were selected from the SASS questionnaire. Table 3.10 shows a summary of teachers' responses to those items. About 43 % of sampled teachers responded that they planned to remain in teaching as long as they are able, while 3.2% of the sampled teachers reported that they planned to leave teaching as soon as they could (R\_T340). Among those who left teaching during the 2000-2001 school year, 30.5% of teachers reported that they did not decide whether they left or stay in teaching during the 1999-2000, while 11.4% of teachers reported that they planned to remain in teaching as long as they could.

Table 3.10 Sample Distributions of Observed Variables for Turnover Intention

Items	All	Leavers	Stayers
R_T340: Plan to remain in teaching			
(1) As long as I am able	42.9 %	11.4 %	44.6 %
(2) Until I am eligible for retirement	31.8 %	16.8 %	32.6 %
(3) Undecided at this time	12.9 %	30.5 %	12.0 %
(4) Will probably continue unless something better comes along	9.2 %	21.7 %	8.5 %
(5) Definitely plan to leave teaching as soon as I can	3.2 %	19.7 %	2.3 %
Mean	1.98	3.21	1.91
SD	1.10	1.26	1.05
Min/Max	1/5	1/5	1/5
T339: Would become a teacher again?			
(1) Certainly would become a teacher	44.8 %	13.7 %	46.5 %
(2) Probably would become a teacher	25.9 %	21.5 %	26.1 %
(3) Chances about even for and against	15.2 %	26.5 %	14.6 %
(4) Probably would not become a teacher	10.1 %	26.7 %	9.2 %
(5) Certainly would not become a teacher	4.0 %	11.6 %	3.6 %
Mean	2.03	3.01	1.97
SD	1.17	1.22	1.14
Min/Max	1/5	1/5	1/5

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Classification chi-square tests were all significant at the .05 level.

On the second item (T\_339), 44.8% of sampled teachers said that they certainly would become a teacher again, while 4.0% said that they certainly would not become a teacher again. Among leavers, 26.7% of teachers reported that they would not become a teacher, while 13.7% of teachers said that they certainly would become a teacher again during 1999-2000 school year. In addition, mean differences between stayers and leavers in scores of

those two items were significant at the .05 level (R\_T340:  $t = -10.887$ ,  $df=1,561$ ,  $p < .01$  and T339:  $t = -8.052$ ,  $df=1,561$ ,  $p < .01$ ).

### Job Satisfaction

Two items to measure teachers' job satisfaction were selected from the SASS questionnaire (See Table 3.11). About 58% of the teacher respondents strongly agreed that they were generally satisfied with being a teacher at their current school, while 2.2% of the teachers reported that they felt strongly dissatisfied (R\_T320). Among leavers in 2000-2001, 15.7% of teachers reported that they strongly disagreed with the statement of overall satisfaction, while 37.2% of the teachers agreed.

Table 3.11 Sample Distributions of Observed Variables for Job Satisfaction

Items	All	Leavers	Stayers
R_T320: I am generally satisfied with being a teacher at this school.			
(1) Strongly disagree	2.2 %	15.7 %	1.4 %
(2) Disagree	6.0 %	14.0 %	5.6 %
(3) Agree	34.3 %	37.2 %	34.1 %
(4) Strongly agree	57.6 %	33.2 %	58.9 %
Mean	3.47	2.88	3.50
SD	.71	1.04	.67
Min/Max	1/4	1/4	1/4
T318: I sometimes feel it is a waste of time to try to do my best as a teacher.			
(1) Strongly agree	3.9 %	15.7 %	3.2 %
(2) Agree	14.0 %	29.3 %	13.2 %
(3) Disagree	16.6 %	14.2 %	16.7 %
(4) Strongly disagree	65.5 %	40.8 %	66.8 %
Mean	3.44	2.80	3.47
SD	.87	1.14	.84
Min/Max	1/4	1/4	1/4

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Classification chi-square tests were all significant at the .05 level.

On the second item (T318), 65.5% of the teachers said that they do not feel it is a waste of time to try their best as a teacher. About 16% of the teachers were leavers, who reported that they strongly agreed that they sometimes felt it was a waste of time to try to do their best as a teacher, while 40.8% of the teachers strongly agree with the same statement. Mean differences between stayers and leavers in scores of those two items were significant at the .05 level (R\_T320:  $t = 4.828$ ,  $df=1,561$ ,  $p < .01$  and T318:  $t = 4.982$ ,  $df=1,561$ ,  $p < .01$ ).

## Exploration of the Factor Structure of Indicators

For the purpose of examining the factor structure of the measures used in this study, both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted with pre-selected items. After performing EFAs, CFAs were conducted to investigate validation of the proposed constructs of interest using the maximum likelihood (ML) estimation method, assuming multivariate normality.

In the CFA procedures, offending estimates, or out-of-range parameter estimates, were checked if, for example, negative error measurement values were found. In order to evaluate the goodness of model fit, chi-square ( $\chi^2$ ) statistics, the ratio of chi-square to degrees of freedom ( $\chi^2/df$ ), and the root mean square error of approximation (RMSEA) were calculated.

### Factor Structure of Salary

The average base salary of sampled teachers in the sample was \$37,769, which was lower than the national average teacher salary (\$39,891), and ranged from \$15,000 to \$85,500.<sup>16</sup> In addition to base salary, the dataset also provided information on whether teachers earned additional income from any work during the summer of 1999, extra-curricular/activities (e.g., coaching, student activity sponsorship, or teaching evening classes), merit-pay bonus/state supplements, or working in any jobs outside of the school system.

As shown in Table 3.12, overall, 16.8% of teachers earned additional income from teaching in their current or other schools during the summer of 1999. 39.3% of teachers earned additional income from extra-curricular or additional activities, while 13.5% of teachers made earnings from other school sources such as a merit-pay bonus. In addition, 15.7% of teachers earned additional income from jobs outside of the school system. On

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<sup>16</sup> There were two teachers who received a salary of \$15,000. This amount of the salary seemed to be small for a full-time teacher. However, some states and districts (e.g., Idaho, Montana, Nebraska, ) offered teachers with a bachelor's degree and no experience a starting base salary of less than \$20,000 (Gruber et al., 2002).

average, the sampled teachers earned the largest amount of additional income (\$844) from working in non-school jobs.

Table 3.12 Sample Distributions of Teachers' Additional Earnings

Items		All	Leavers	Stayers
R_T341	During the summer of 1999, did you have any earnings from teaching summer school in this or any other school?	16.8%	8.4%	17.3%
R_T342				
Mean		\$330	\$246	\$334
SD		\$909	\$946	\$906
Min		\$0	\$0	\$0
Max		\$8,000	\$8,000	\$8,000
R_T343	During the summer of 1999, did you have any earnings from working in a non-teaching job in this or any other school?	4.6%	6.4%	4.5%
R_T344				
Mean		\$69	\$140	\$65
SD		\$439	\$675	\$422
Min		\$0	\$0	\$0
Max		\$10,000	\$5,000	\$10,000
R_T345	During the summer of 1999, did you have any earnings from working in any non-school job?	20.0%	39.0%	18.9%
R_T346				
Mean		\$844	\$2,567	\$751
SD		\$3,336	\$6,247	\$3,074
Min		\$0	\$0	\$0
Max		\$40,000	\$40,000	\$40,000
R_T348	During the current school year, do you, or will you, earn any additional compensation from this school system for extracurricular or additional activities such as coaching, student activity sponsorship, or teaching evening classes?	39.3%	47.0%	38.9%
R_T349				
Mean		\$714	\$862	\$706
SD		\$1,642	\$1,675	\$1,640
Min		\$0	\$0	\$0
Max		\$22,300	15,000	\$22,300
R_T350	During the current school year, have you earned income from any other school sources this year, such as a merit pay bonus, state supplement, etc.?	13.5%	11.2%	13.6%
R_T351				
Mean		\$162	\$151	\$163
SD		\$640	\$525	\$645
Min		\$0	\$0	\$0
Max		\$10,000	\$5,000	\$10,000
R_T352	During the current school year, do you, or will you, earn additional compensation from working in any job outside this school system?	15.7%	34.6%	14.7%
R_T353				
Mean		\$20	\$1,852	\$659
SD		\$3,090	\$4,526	\$2,980
Min		\$0	\$0	\$0
Max		\$50,000	\$30,000	\$50,000

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Classification chi-square tests were all significant at the .05 level

As indicated in Table 3.12, leavers made more money working in non-teaching jobs (\$140), working in non-school jobs (\$2,567), from extra activities in schools (\$862), and jobs outside school system (\$1,852) than stayers. Among these differences, additional earnings from working in non-school jobs and jobs outside of school system were statistically significant at the .05 level (See Table 3.13).

One-factor confirmatory factor analysis was conducted with one indicator of academic base-salary and six indicators of additional income rescaled to measure in ten thousands of dollars. However, a series of CFA did not reach acceptable model fits. This might be due to high kurtosis values in indicators of additional income.<sup>17</sup>

Table 3.13 Results of Mean Difference in Additional Earnings

Items	Stayers	Leavers	Mean Difference	SE Difference	df	t statistic	p value < t
R_T342	334	246	88	80.01	1561	1.107	.269
R_T344	65	140	-75	53.681	1561	-1.394	.163
R_T346	751	2,567	-1816	911.117	1561	-1.993	.046
R_T349	706	862	-156	144.579	1561	-1.075	.282
R_T351	163	151	12	51.223	1561	0.231	.818
R_T353	659	1,852	-1193	397.02	1561	-3.006	.003

Note: Weighted N=237,530, unweighted N=1,563

Thus, six composite variables to reflect yearly earnings were created by summing relevant items; total yearly earnings (SL\_ALL=R\_T342 + R\_T0344 + R\_T0346 + R\_T0347 + R\_T0349 + R\_T0351 + R\_T0353), school-related earnings (SL\_SCH=R\_T342+R\_T344+R\_T347+R\_T349+R\_T351), total yearly additional earnings (SL\_ADD= R\_T342 + R\_T0344 + R\_T0346+ R\_T0349 + R\_T0351 + R\_T0353), summer earnings in school (SL\_SUM=R\_T342 and R\_T344), extra earnings in school (SL\_EXT=R\_T349 and R\_T351), and earnings from jobs outside schools (SL\_NSCH=R\_T346 and R\_T353).

Table 3.14 shows basic descriptive statistics for composite variables for salary,

<sup>17</sup> Indicators of additional income (R\_T342, R\_T344, R\_T346, R\_T349, R\_T351, and R\_T353) had high kurtosis values, ranging from 17.19 to 89.02. Absolute kurtosis values of more than 3.0 can affect the model fit of the SEM model (Kline, 2005).

including academic base salary. On average, the sampled teachers earned total yearly earnings of \$40,608, school-related earnings of \$39,043, academic base salaries of \$37,769 during the 1999-2000 school year, and total additional earnings of \$2,837. Additionally, on average, these teachers made \$398, \$876, and \$1,564 from work in schools during the summer of 1999, extra activities and bonuses, and work from jobs outside of school system, respectively. Those who left teaching had more earnings in two categories: Summer earning in schools and earnings from job outside school system.

Table 3.14 Results of Mean, Standard Deviation, Minimum, and Maximum for Salary

Earnings (\$)	All			Leavers			Stayers		
	Mean	SD	Min/Max	Mean	SD	Min/Max	Mean	SD	Min/Max
Total yearly earnings (SL_ALL)	40,608	13,027	15,000/ 172,100	39,37 7	12,315	18,700/ 95,200	40,674	13,061	15,000/ 172,100
School-related earnings (SL_SCH)	39,043	11,662	15,000/ 91,500	34,95 7	9,189	18,500/ 68,027	39,264	11,740	15,000/ 91,500
Base salary (SL_BASE)	37,769	11,296	15,000/ 85,500	33,56 0	8,834	15,000/ 68,000	37,996	11,370	15,000/ 85,500
Total yearly additional earnings (SL_ADD)	2,839	6,215	0/ 101,200	5,817	9,144	0/65,400	2,678	5,974	0/ 101,200
Summer earning in schools (SL_SUM)	398	1,015	0/ 12,695	385	1,153	0/ 8,000	398	1,007	0/ 12,695
Extra earnings in schools (SL_EXT)	876	1,756	0/ 22,300	1,013	1,753	0/ 15,000	869	1,756	0/ 22,300
Earnings from jobs outside school system (SL_NSCH)	1,564	5,573	0/ 80,000	4,420	8,708	0/ 65,000	1,410	5,308	0/ 80,000

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Significance level for classifications = .05

3. The teacher who earned the highest total yearly earnings of \$172,100 also made \$80,000 from jobs outside school system.

As shown in Table 3.15, there were significant mean differences at the .05 level between leavers and stayers in school-related earnings, base salary, total yearly additional earnings, and earnings from jobs outside school system. Particularly, teachers who stayed in teaching had a higher average base salary than those who left (\$37,996 and \$33,560) and this difference was significant at the .05 level. This finding was consistent with other empirical studies that show that teachers with lower salary have higher attrition rates (Darling-Hammond & Sclan, 1996; Ingersoll, 2001; Murnane et al., 1991; Stinebrickner, 2001).

Table 3.15 Results of Mean Difference between Leavers and Stayers in Salary

Variables (\$)	Stayers	Leavers	Mean Difference	SE Difference	df	t statistic	p value< t
Total yearly earnings (SL_ALL)	40,674	39,377	1,297	1398.58	1561	.927	.354
School-related earnings (SL_SCH)	39,264	34,957	4,307	1052.82	1561	4.091	.000
Base salary (SL_BASE)	37,996	33,560	4,436	1042.91	1561	4.254	.000
Total yearly additional earnings (SL_ADD)	5,817	2,678	3,139	1086.29	1561	-2.890	.004
Summer earning in schools (SL_SUM)	398	385	13	97.21	1561	.141	.888
Extra earnings in schools (SL_EXT)	869	1,013	-144	150.01	1561	.958	.338
Earnings from jobs outside school system (SL_NSCH)	1,410	4,420	-3,010	1019.78	1561	-2.951	.003

Note: Weighted N=237,530, unweighted N=1,563

Table 3.16 shows correlation coefficients for observed variables for salary. The highest correlation coefficient was found between academic base salary and school-related earnings ( $r = .983$ ), while the lowest correlation coefficient was found between academic base salary and earnings from jobs outside school system ( $r = -.003$ ).

Table 3.16 Correlations among Indicators for Salary

Variable (\$)	SL_ALL	SL_SCH	SL_BASE	SL_ADD	SL_SUM	SL_EXT	SL_NSCH
Total yearly earnings (SL_ALL)	--						
School-related earnings (SL_SCH)	.904	--					
Base salary (SL_BASE)	.879	.983	--				
Total yearly additional earnings (SL_ADD)	.498	.108	.025	--			
Summer earning in schools (SL_SUM)	.151	.158	.053	.219	--		
Extra earnings in schools (SL_EXT)	.262	.225	.066	.430	.129	--	
Earnings from jobs outside school system (SL_NSCH)	.446	.020	-.003	.940	.021	.141	--

Note: Weighted N=237,530, unweighted N=1,563

A series of one-factor confirmatory factor analysis was conducted with any combinations of seven variables representing salary construct. CFAs failed to reach acceptable model fit in any model.<sup>18</sup> Thus, I considered academic base salary as the best measure of teacher salary for the remaining analyses.

### **Factor Structure of Working Conditions**

After filtering out the variables that were clearly not relevant to the study, all 49 of the SASS items related to working conditions were selected for exploratory factor analysis. Exploratory factor analysis was performed with principal component analysis (PCA) and the extracted factors were rotated with the varimax method for better interpretability.

Prior to performing PCA the suitability of the data for factor analysis was assessed. The Kaiser-Meyer-Olkin measure of sampling adequacy was .915, indicating that the input correlation matrix is adequate for exploratory factor analysis.<sup>19</sup> The Barlett's Test of Sphericity reached statistical significance ( $p < .01$ ), supporting the factorability of the correlation matrix (Hair et al., 1998).

In an iterative manner, a series of factor analyses was performed to extract factors that gave the best representation of the items and to exclude question items with low factor loadings ( $< .60$ ), low communalities extracted ( $< .40$ ), and/or cross-loadings. While principal component analysis revealed the presence of 11 components with eigenvalues exceeding 1, an inspection of screeplot showed a clear break after the fifth component, explaining 47% of the total variance. In the numerous rounds of factor analyses to discover all possible combinations of clustering variables into factors, the final factor analysis generated five factors with 27 items. Extracted factors consisted of from three to seven items with factor

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<sup>18</sup> I also conducted a series of one-factor CFA using transformed variables by log and square root in order to reduce high kurtosis values in salary for indicators, but I did not get any acceptable model fit.

<sup>19</sup> Hair et al. (1998) indicate that a KMO of .80 or above is "meritorious"; between .80 and .70 is "middling"; between .70 and .60 is "mediocre"; between .60 and .50 is "miserable"; below .50 is "unacceptable."

loading rangings from .602 to .886. There were also high internal consistency ratings, with all alphas greater than .7 except that for “teacher influence over school policy,” which was .676.<sup>20</sup> Table 3.17 summarizes the result of exploratory factor analysis for the working conditions factors with the factor loadings and Cronbach’s alpha as a measure of reliability.

Table 3.17 Results of Exploratory Factor Analysis for Working Conditions

Factors	Items	Factor Loading	Cronbach Alpha	
Student Misbehavior (SM)	T330	Problem-Drug abuse	.862	.907
	T329	Problem-Alcohol use	.853	
	T328	Problem-Student pregnancy	.797	
	T333	Problem-Drop outs	.788	
	T324	Problem-Student cutting class	.718	
	T331	Problem-Student possession of weapons	.612	
Family/ Parent Support (PS)	T337	Problem-Unprepared students	.817	.880
	T335	Problem-parental involvement	.771	
	T336	Problem-poverty	.747	
	T338	Problem-student health	.734	
	T332	Problem-Disrespect for teachers	.649	
	T334	Problem-Student apathy	.617	
	T325	Problem-Phys conflicts	.602	
Principal Leadership/ Administrative Support (AS)	R_T310	Agree-The principal knows what kind of school he/she wants and has communicated it to the staff	.769	.867
	R_T299	Agree-The principal lets staff members know what is expected of them	.723	
	R_T312	Agree-In this school, staff members are recognized for a job well done	.723	
	R_T300	Agree-The school administrator’s behavior toward the staff is supportive and encouraging.	.702	
	R_T306	Agree-My principal enforces school rules and backs me up when I need it	.693	
	R_T311	Agree-There is a great deal of cooperative effort among the staff members	.632	
	R_T307	Agree-The principal talks with me frequently about my instructional practices	.617	
Teacher Control (TC)	T296	Control-Evaluating and grading students	.743	.705
	T295	Control-Selecting teaching techniques	.741	
	T298	Control-Determining the amount of homework	.658	
	T294	Control-Selecting content, topics, and skills	.607	
Teacher Influence (TI)	T290	Influence-Hiring new teachers	.693	.676
	T289	Influence-Evaluating teachers	.690	
	T288	Influence-Determining the content of in-service professional development	.640	

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Factor loadings were all significant at the .05 level.

<sup>20</sup> While Cronbach alpha coefficient for teacher influence factor was slightly low than the criterion that is usually accepted, the study included teacher influence factor for further analysis. In general, Cronbach’s alpha coefficient is sensitive the number of variables that consist of the factor.

The exploratory factor analysis (EFA) was followed by confirmatory factor analysis (CFA) in order to confirm the EFA results. Each underlying factor that was revealed from the EFA was regressed on its items individually to verify appropriateness of the placement of indicators to each factor and the significance of the association. An error was attached to each of the observed variables to account for the disturbances in survey responses. Table 3.18 summarizes the results of the confirmatory factor analysis for working conditions.

Table 3.18 Results of Confirmatory Factor Analysis for Working Conditions

Factor/Variable	Standardized Factor Loadings	Reliability (R-square)
<b>Student Misbehavior (SM)</b>		
T330	.943	.890
T329	.925	.856
T328	.778	.605
T333	.765	.585
T324	.665	.442
T331	.584	.341
<b>Family/ Parent Support (PS)</b>		
T337	.863	.746
T335	.795	.632
T336	.705	.497
T338	.661	.437
T332	.697	.486
T334	.703	.494
T325	.588	.346
<b>Principal Leadership/ Administrative Support (AS)</b>		
R_T310	.773	.598
R_T299	.761	.579
R_T312	.710	.504
R_T300	.781	.610
R_T306	.725	.526
R_T311	.546	.298
R_T307	.588	.345
<b>Teacher Control in Classroom(TC)</b>		
T296	.754	.568
T295	.714	.509
T298	.570	.325
T294	.519	.270
<b>Teacher Influence in School Policy (TI)</b>		
T290	.611	.374
T289	.718	.516
T288	.617	.380

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Standardized factor loadings were all significant at the .05 level.

The goodness of model fit indices were satisfactory except for the chi-square statistic, where  $\chi^2(314) = 1148.566 (p < .01)$ ,  $\chi^2/df = 3.658$ , and RMSEA = .041. In general, a large  $p$

value for the chi-square statistic is expected for a good model fit to the data. Considering that chi-square statistic is very sensitive to the sample size, however, the significant chi-square statistic was not considered problematic for this analysis. All of the standardized factor loadings – as a common measure for the validity of an observed variable as a measure of a given latent variable – were significant at the .05 level. The  $R^2$  values from the measurement model for each observed variable as a measure of reliability in CFA ranged from .270 to .890.

These latent variables representing the five major components of working conditions were then allowed to correlate with one another. Table 3.19 shows correlations among the working conditions factors. All of the correlation coefficients were significant at the .05 level. Principal leadership/Administrative support and Teacher influence in school policy had the highest correlation coefficient ( $r=.436$ ).

Table 3.19 Correlations among Working Conditions Factors

Factors	SM	PS	AS	TC	TI
Student Misbehavior (SM)	--				
Family/Parental Support (PS)	.395	--			
Principal Leadership/ Administrative Support (AS)	.260	.339	--		
Teacher Control in Classroom (TC )	-.121	.129	.264	--	
Teacher Influence in School Policy (TI)	.086	.206	.436	.159	--

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Correlation coefficients were all significant at the .05 level.

Table 3.20 summarizes descriptive statistics for five indicators for working conditions. On average, teachers who stayed in teaching had higher scores than leavers on four factors: Student Misbehavior, Family/Parent Support, and Principal Leadership/Administrative Support, Teacher Influence in School Policy. There were statistically significant differences between leavers and stayers in teachers' perceptions about student misbehavior ( $t = 5.911$ ,  $df=1,561$ ,  $p<.01$ ) and family/parent support ( $t = 2.096$ ,  $df=1,561$ ,  $p<.05$ ).

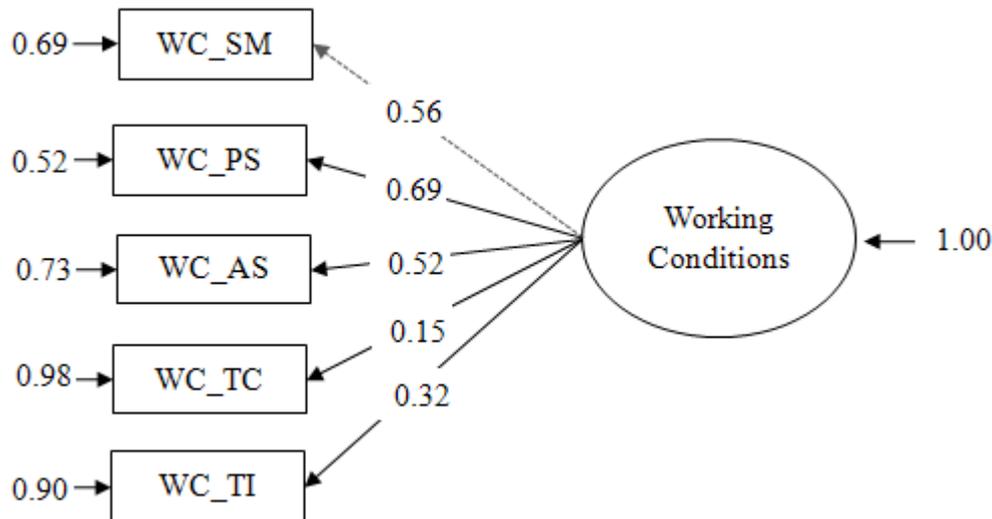
Table 3.20 Mean, Standard Deviation, Minimum, and Maximum for Working Conditions Indicators

Variables	All			Leavers			Stayers		
	Mean	SD	Min/Max	Mean	SD	Min/Max	Mean	SD	Min/Max
Student Misbehavior	21.61	3.57	6/24	18.85	4.72	6/24	21.76	3.43	6/24
Family/Parent Support	18.37	5.06	7/28	17.06	5.17	7/28	18.44	5.04	7/28
Principal Leadership/Administrative Support	18.59	3.99	6/24	17.68	4.70	6/24	18.64	3.94	6/24
Teacher Control in Classroom	16.55	2.80	4/20	16.89	2.56	5/20	16.53	2.82	4/20
Teacher Influence in School Policy	6.72	2.68	3/15	6.57	2.48	3/14	6.73	2.69	3/15

Note: Weighted N for all=237,530 (unweighted N=1,563), weighted N for leavers=12,186 (Unweighteed=222), and weighted N for stayers=225,344 (unweighted N=1,343)

These five factors, listed in Table 3.20, with their respective observed indicators, in turn, became indicators for the latent variable of working conditions in the overall measurement and structural model by aggregating indicators representing each of the corresponding five factors. It is fairly common for researchers to use total scale scores as an indicator for the latent variable to enhance reliability of indicators and reduce the number of parameters to be estimated for the parsimonious model (Cappella & Weinstein, 2001; Coffman & MacCallum, 2005; Landis, Beal, & Tesluk, 2000; Miller & Byrnes, 2001).<sup>21</sup> For example, items T290, T289, and T288 for teacher influence in school policy were summed into one indicator for working conditions in the overall structural equation model. In this way, the five working conditions components, therefore, were treated as observed variables in the structural equation model. Figure 3.5 displays one-factor CFA with five components for working conditions.

<sup>21</sup> In a situation where a construct is measured by a scale with multiple items, several different aggregation levels of latent variable indicators can be considered (Bagozzi & Edwards, 1998; Gribbons & Hocevar, 1998); total disaggregation (each item serves as an indicator for a construct), partial disaggregation (several items are summed or averaged resulting in parcels), and total aggregation (all of the items for a scale are summed or averaged).



$\chi^2(5)=128.67$  ( $p<.01$ ),  $\chi^2/df=25.73$ , and RMSEA=.126

Figure 3.5 Initial One-Factor Model for Working Conditions<sup>22</sup>

While all standardized factor loadings were significant at the .05 level, the model fit was unsatisfactory, where  $\chi^2(5) = 128.67$  ( $p<.01$ ),  $\chi^2/df=25.73$ , and RMSEA=.126. Modification indices suggested a problem associated with the error covariance between WC\_AS (principal leadership/administrative support) and WC\_TI (teacher influence in school policy) and WC\_SM (student misbehavior) and WC\_TC (teacher control in classroom). The modification index for error covariance suggested that the largest amount of chi-square decrease ( $\chi^2=135.2$ ) would occur if the WC\_AS and WC\_TI were allowed to be correlated. The correlation between WC\_AS and WC\_TI in error variance was allowed to be freely estimated as recommend by the modification index to better reflect reality. Empirically, some studies found that facilitative principal leadership and administrative support that provide teachers' authority and opportunities to participate in decisions about policies and

<sup>22</sup> In the path diagram, the dotted arrow from latent variables to observed variables indicates a reference variable. In general, the most reliable indicator is selected as a reference indicator and the factor loading between a reference indicator and latent variable is fixed with some value, typically 1. Though the standardized factor loading of WC\_TC is low (less than 3.0), the model fit without WC\_TC did not improve. Thus I decided to keep WC\_TC in the model.

practices are positively associated with teachers' job satisfaction and commitment (Blase & Kirby, 1992; Clift, Veal, Holland, Johnson, & McCarthy, 1995; Conley, 1991).

Figure 3.6 shows the revised one-factor confirmatory factor analysis. However, the model fit was still unsatisfactory, where  $\chi^2(4) = 67.39$  ( $p < .01$ ),  $\chi^2/df = 16.98$ , and RMSEA = .101. Based on these model fit indices, the first revised model was revised again. The modification index for error covariance suggested that correlation between WC\_TC (teacher control in classroom) and WC\_SM (student misbehavior). If these indicators are allowed to correlated, the chi-square statistic would decrease by 87.9. Some scholars have found that the control over instruction and discipline held by teachers has an independent association with student misbehavior; there are fewer student behavioral problems in schools where teachers perceives having more control (Evertson & Weinstein, 2006; Ingersoll, 2003b).

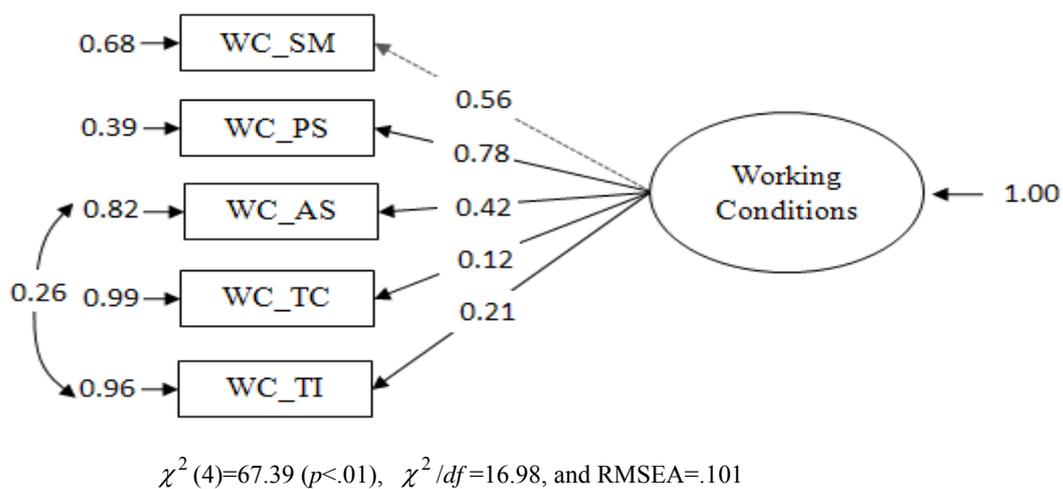
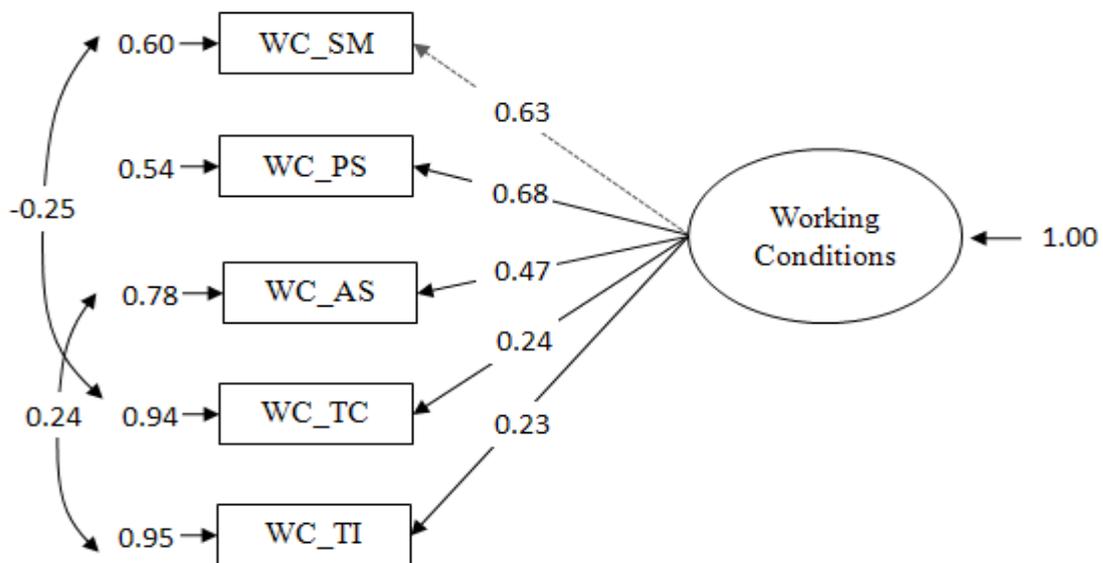


Figure 3.6 The First One-Factor Model for Working Conditions

Figure 3.7 displays the second revised model that allows correlated error variance between WC\_TC and WC\_SM. The model fit was satisfactory, where  $\chi^2(3) = 17.88$  ( $p < .01$ ),  $\chi^2/df = 5.96$ , and RMSEA = .056. All standardized factor loadings were significant at

the .05 level, ranging from .68 to .23. The test of improvement of model fit was conducted with the likelihood ratio test. Along with other better model fit indices, the result of the chi-square difference test supported the improvement of the model fit ( $G^2=49.51$ ,  $df=1$ ,  $p<.01$ ) as shown in Table 3.21, rejecting the null hypothesis that there is no improvement in model fit due to the revision.



$$\chi^2(3)=17.88 (p<.01), \chi^2/df=5.96, \text{ and RMSEA}=.056$$

Figure 3.7 The Second One-Factor Model for Working Conditions

Table 3.21 Result of the Chi-square Difference Test for One-Factor CFA for Working Conditions

CFA Model	$\chi^2$	<i>df</i>	<i>p</i> value	$\chi^2/df$	RMSEA
Initial Model	128.67	5	<.01	25.73	.126
First Revised Model	67.39	4	<.01	16.98	.101
Second Revised Model	17.88	3		5.96	.056
$\chi^2_{\text{difference}}$ (Initial-First)	61.28	1	<.01		
$\chi^2_{\text{difference}}$ (First-Second)	49.51	1	<.01		

### Factor Structure of Professional Training Experiences

Regarding the nine professional development activities related to teaching, the majority of teachers participated in regularly-scheduled collaborations with other teachers on

issues of instruction (75.0%) and attended workshops, conferences, or training (95.4%), as indicated in Table 3.22.

Specifically, 48.6% of teachers reported participation in individual or collaborative research and 21.2% of teachers said that they attended workshops, conferences or training as a presenter. Over thirty percent of teachers in the sample were more likely to have taken university courses for recertification or advanced certification, and 23.2% reported taking university courses in their main teaching assignment field. As indicated in Table 3.22, leavers had more opportunities to participate in such professional development activities than stayers: (1) university course(s) taken for recertification or advanced certification, (3) observational visits to other schools, (6) mentoring and/or peer observation and coaching, and (8) attending workshops, conferences or training. Of leavers, 97.7% of the teachers reported attending workshops, conferences or training.

Table 3.22 Sample Distributions of Participation of Professional Development Activities

	Items	All	Leavers	Stayers
	In the past 12 months, have you participated in the following activities related to teaching?			
R_T150	(1) University course(s) taken for recertification or advanced certification in your main teaching assignment field or other teaching field.	30.6%	31.2%	30.5%
R_T151	(2) University course(s) in your main teaching assignment field.	23.2%	22.0%	23.3%
R_T152	(3) Observational visits to other schools.	34.9%	40.1%	34.6%
R_T153	(4) Individual or collaborative research on a topic of interest to you professionally.	48.6%	43.6%	49.0%
R_T154	(5) Regularly-scheduled collaboration with other teachers on issues of instruction.	75.0%	70.0%	75.3%
R_T155	(6) Mentoring and/or peer observation and coaching, as part of a formal arrangement that is recognized or supported by the school or district.	46.8%	49.5%	46.6%
R_T156	(7) Participating in a network of teachers (e.g., one organized by an outside agency or over the Internet).	25.6%	20.8%	25.8%
R_T157	(8) Attending workshops, conferences or training.	95.4%	97.7%	95.2%
R_T158	(9) Workshops, conferences or training in which you were the presenter.	21.2%	18.4%	21.3%

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Classification chi-square tests were all significant at the .05 level.

Regarding six topical areas concerning teachers' main teaching assignment, about two-thirds of teachers participated in professional development activities topical areas such as in-depth study of the content (62.1%), content and performance standards (74.5%), methods of teaching (76.0%), uses of computers for instruction (69.1%), and student assessment (62.2%). As indicated in Table 3.23, stayers had more opportunities to participate in all of the topical areas than leavers, except for methods of teaching (R\_T168).

Table 3.23 Sample Distributions of Participation of Professional Development Activities in Content-Related Topical Areas

	Items	All	Leavers	Stayers
R_T159	In the past 12 months, have you participated in any professional development activities that focused on in-depth study of the content in your main teaching assignment field?	62.1%	55.3%	62.5%
R_T162	In the past 12 months, have you participated in any professional development activities that focused on content and performance standards in your main teaching assignment field?	74.5%	69.6%	74.8%
R_T165	In the past 12 months, have you participated in any professional development activities that focused on methods of teaching?	76.0%	72.3%	76.2%
R_T168	In the past 12 months, have you participated in any professional development activities that focused on uses of computers for instruction?	69.1%	69.8%	69.1%
R_T171	In the past 12 months, have you participated in any professional development activities that focused on student assessment, such as methods of testing, evaluation, performance assessment, etc?	62.2%	54.7%	62.6%
R_T174	In the past 12 months, have you participated in any professional development activities that focused on student discipline and management in the classroom?	42.7%	38.7%	43.0%

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Classification chi-square tests were all significant at the .05 level except for R\_T168.

Regarding participation hours in topical areas, teachers had the most participating hours in activities that focused on in-depth study of content (Mean=1.63, SD=1.55) and the least hours in student discipline and management in the classroom (Mean=.64, SD=.91) (See Table 3.24). Teachers who left teaching spent less time in all of the topical areas than their counterparts who stayed in teaching. There were mean difference between leavers and stayers in participation hours of the in-depth study of content ( $t = 2.947$ ,  $df=1,561$ ,  $p<.01$ ) and content and performance standards ( $t = 2.204$ ,  $df=1,561$ ,  $p<.05$ ).

Table 3.24 Results of Mean and Standard Deviation for Participation Hours and Usefulness in Topical Areas, and Overall Usefulness

Items	All		Leavers		Stayers		
	Mean	SD	Mean	SD	Mean	SD	
R_T160	In the past 12 months, how many hours did you spend on the activities that focused on in-depth study of the content in your main teaching assignment field?	1.63	1.55	1.23	1.35	1.65	1.55
R_T163	In the past 12 months, how many hours did you spend on the activities that focused on content and performance standards in your main teaching assignment field?	1.56	1.29	1.32	1.19	1.58	1.29
R_T166	In the past 12 months, how many hours did you spend on the activities that focused on methods of teaching?	1.51	1.25	1.35	1.17	1.52	1.26
R_T169	In the past 12 months, how many hours did you spend on the activities that focused on uses of computers for instruction?	1.30	1.23	1.25	1.22	1.30	1.23
R_T172	In the past 12 months, how many hours did you spend on the activities that focused on student assessment?	1.00	1.06	.84	.97	1.01	1.06
R_T175	In the past 12 months, how many hours did you spend on the activities that focused on student discipline and management in the classroom?	.64	.91	.55	.80	.64	.91
R_T161	Overall, how useful were these activities that focused on in-depth study of the content in your main teaching assignment field to you?	2.46	2.04	1.95	1.89	2.48	2.05
R_T164	Overall, how useful were these activities that focused on content and performance standards in your main teaching assignment field to you?	2.71	1.79	2.34	1.80	2.73	1.79
R_T167	Overall, how useful were these activities that focused on methods of teaching to you?	2.86	1.81	2.48	1.72	2.89	1.82
R_T170	Overall, how useful were these activities that focused on uses of computers for instruction to you?	2.62	1.95	2.63	1.93	2.62	1.95
R_T173	Overall, how useful were these activities that focused on student assessment to you?	2.23	1.90	1.91	1.86	2.25	1.90
R_T176	Overall, how useful were these activities that focused on student discipline and management in the classroom to you?	1.58	1.95	1.40	1.85	1.59	1.96
R_T178	Thinking about all the professional development you have participated in over the 12 months, how useful was it?	3.69	.91	3.50	.94	3.70	.91

- Notes: 1. Original items for participation hours in topical areas are categorical with the following response options: (1) 8 hours or less, (2) 9-16 hours, (3) 17-32 hours, and (4) 33 hours or more. The recoded items included teachers who did not participated in activities by assigning "0=did not participate."  
2. The recoded items for each of usefulness of participation in topical areas are recoded by including those who did not participated in activities : (0) did not participated into original scales, (1) Not useful at all ~ (5) Very useful.

Regarding teachers' evaluation of activities in topical areas in which they participated (R\_T161~R\_T176), teachers judged that activities focused on methods of teaching were the

most useful of the six topical areas (Mean=2.86, SD=1.81) and student discipline and classroom management was the least useful (Mean=1.58, SD=1.95), as indicated in Table 3.24. Compared to stayers, teachers who left teaching rated all professional development activities less useful except the use of computers for instruction. Mean differences between leavers and stayers were significant at the .05 level in teachers' evaluation of the in-depth study of the content ( $t = 2.509, df=1,561, p<.05$ ) and methods of teaching ( $t = 2.171, df=1,561, p<.05$ ).

Overall, teachers' evaluations of all activities in which they participated (R\_T178), were positive (Mean=3.69, SD=.91). Teachers who stayed in teaching perceived the usefulness of all professional development activities in which they participated higher on average (Mean= 3.70, SD=.91) than did those who left teaching (Mean=3.50, SD=.94), though differences were not statistically significant.

Table 3.25 Sample Distributions of Support for Participation in Professional Development Activities

	Items	All	Leavers	Stayers
	For the professional development in which you participated in the last 12 months, did you receive the following types of support?			
R_T179	(1) Release time from teaching (i.e., your regular teaching responsibilities were temporarily assigned to someone else)	58.5%	57.7%	58.5%
R_T180	(2) Scheduled time in the contract year for professional development	72.5%	72.6%	72.5%
R_T181	(3) Stipend for professional development activities that took place outside regular work hours	42.6%	33.5%	43.0%
R_T182	(4) Full or partial reimbursement of college tuition	13.8%	15.9%	13.7%
R_T183	(5) Reimbursement for conference or workshop fees	47.3%	49.2%	47.2%
R_T184	(6) Reimbursement for travel and/or daily expenses	30.4%	35.9%	30.1%

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Classification chi-square tests were all significant at the .05 level except for R\_T179 and R\_T180.

In relation to types of support for participation in professional development activities, teachers were more likely to receive administrative supports in the forms of release time from teaching (58.5%) and scheduled time for participation (72.5%) than financial supports such as stipends for professional development activities that took place outside regular work hours

(42.67%), full or partial reimbursement of college tuition (13.8%), reimbursement for conference or workshop fees (47.3%) and for travel and/or daily expenses (30.4%) (See Table 3.25). Compared to stayers, leavers reported receiving more support in the form of stipend for professional development activities that took place outside regular work hours.

In terms of the rewards received as a result of completing these professional development activities, completion of professional development training was less likely to lead to salary increases (13.0%) or annual teacher evaluations (19.7%) than credits for recertification or advanced certification (41.9%) (See Table 3.26). Leavers reported receiving less rewards for their participation in professional development activities than stayers in such categories as increase in salary increases and annual teacher evaluation.

Table 3.26 Sample Distributions of Rewards after Completion of Participation of Professional Development Activities

Items		All	Leavers	Stayers
As a result of completing these professional development activities, did you receive the following rewards?				
R_T185	(1) Credits towards re-certification or advanced certification in your main teaching assignment field or other teaching field(s)	41.9%	46.8%	41.6%
R_T186	(2) Increase in salary or other pay increases as a result of participating in professional development activities	13.0%	7.7%	13.3%
R_T187	(3) Recognition or higher ratings on an annual teacher evaluation	19.7%	13.1%	20.0%

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Classification chi-square tests were all significant at the .05 level.

Since most of the items for professional training experiences were dichotomous, I created a series of composite variables with the proposed 37 items as a means of data reduction: (1) Participation of professional development activities (PD\_PAR), (2) Participation of content-related topical areas (PD\_SPAR), (3) Participation hours of topical areas (PD\_SHRS), (4) Usefulness of participation in topical areas (PD\_SUSE), (5) Supports for participation in activities (PD\_SUP), and (6) Rewards after completions of activities (PD\_REW). Specifically, the composite variable for PD\_PAR was created by summing the 9

items displayed in Table 3.22. The composite for PD\_SPAR consists of six content-focused topical areas: In-depth study of the content, content and performance standards, methods of teaching, computer use for instruction, student assessment, disciplines and management.

PD\_SHRS and PD\_SUSE were created using teachers' responses on each of the six content-related items. PD\_SUP and PD\_REW were created using items indicated in Table 3.25 and 3.26. In addition, overall usefulness of professional training experiences (PD\_OUSE) was included to examine the factor structure of professional training experiences as an indicator.

Table 3.27 summarizes descriptive statistics and correlations for the created composite variables for professional training experiences. All correlation coefficients were significant at the .05 level. The highest correlation coefficient was found between PD\_SPAR and PD\_SUSE ( $r = .904$ ), while the lowest correlation coefficient was observed between PD\_SUP and PD\_REW ( $r = .132$ ).

Table 3.27 Correlations among Composite Variables of Professional Training Experiences

Variable	PD_PAR	PD_SPAR	PD_SHRS	PD_SUSE	PD_SUP	PD_REW	PD_OUSE
PD_PAR	--						
PD_SPAR	.362	--					
PD_SHRS	.402	.749	--				
PD_SUSE	.390	.904	.754	--			
PD_SUP	.281	.206	.186	.236	--		
PD_REW	.280	.222	.266	.245	.132	--	
PD_OUSE	.270	.343	.368	.592	.178	.180	--

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Correlation coefficients were all significant at the .05 level.

Table 3.28 summarizes descriptive statistics for the created composite variables for professional training experiences. Teachers who stayed in teaching had higher scores for all of the composite variables for professional training experiences. The mean differences between stayers and leavers in PD\_SHRS and PD\_SUSE were significant at the .05 level as indicated in Table 3.29.

Table 3.28 Mean, Standard Deviation, Minimum, and Maximum for Professional Training Experience Indicators

Variables	All			Leavers			Stayers		
	Mean	SD	Min/Max	Mean	SD	Min/Max	Mean	SD	Min/Max
PD_PAR	4.01	1.78	0/9	3.93	1.75	0/8	4.02	1.78	0/9
PD_SPAR	3.87	1.53	0/6	3.60	1.62	0/6	3.88	1.52	0/6
PD_SHRS	7.64	4.44	0/23	6.54	4.15	0/21	7.70	4.45	0/23
PD_SUSE	14.46	6.94	0/30	12.71	6.73	0/30	14.55	6.94	0/30
PD_SUP	2.65	1.50	0/6	2.65	1.52	0/6	2.65	1.50	0/6
PD_REW	0.75	0.78	0/3	.68	.74	0/3	.75	.78	0/3
PD_OUSE	3.69	0.91	1/5	3.50	.94	1/5	3.70	.91	1/5

Note: Weighted N for all=237,530 (unweighted N=1,563), weighted N for leavers=12,186 (unweighted=222), and weighted N for stayers=225,344 (unweighted N=1,343)

Table 3.29 Results of Mean Difference between Leavers and Stayers in Professional Training Experiences

Variables	Stayers	Leavers	Mean Difference	SE Difference	df	t statistic	p value< t
PD_PAR	4.02	3.93	.08	.19	1561	.428	.669
PD_SPAR	3.88	3.60	.28	.20	1561	1.406	.160
PD_SHRS	7.70	6.54	1.16	.47	1561	2.487	.013
PD_SUSE	14.55	12.71	1.84	.79	1561	2.327	.020
PD_SUP	2.65	2.65	.00	.19	1561	.011	.991
PD_REW	.75	.68	.07	.08	1561	.875	.382
PD_OUSE	3.70	3.50	.20	.11	1561	1.871	.062

Note: Weighted N=237,530, unweighted N=1,563

One-factor confirmatory factor analysis was conducted with seven composite variables for professional training experiences. The result was not admissible due to the negative error variance in PD\_SUSE, suggesting model revisions. The revised model excluded the indicator of PD\_SUSE.

The second revised model excluded PD\_SUP (See Figure 3.9). The second revised model fit indices were  $\chi^2(5) = 37.93$  ( $p < .01$ ),  $\chi^2/df = 7.59$ , and RMSEA = .065.<sup>23</sup> The test

<sup>23</sup> Though the model fit indices of the second revised model were better than the first one, they were still unsatisfactory. However, modification indices for the model improvement of the second revised model suggested small amount of decrease in chi-square. Thus, the study used the second revised one-factor model for professional training experiences for further analysis.

of improvement of model fit was conducted with the likelihood ratio test. The result supported model improvement ( $G^2=43.74$ ,  $df=4$ ,  $p<.01$ ). Table 3.30 shows a summary of descriptive statistics for all variables considered in the structural equation model.

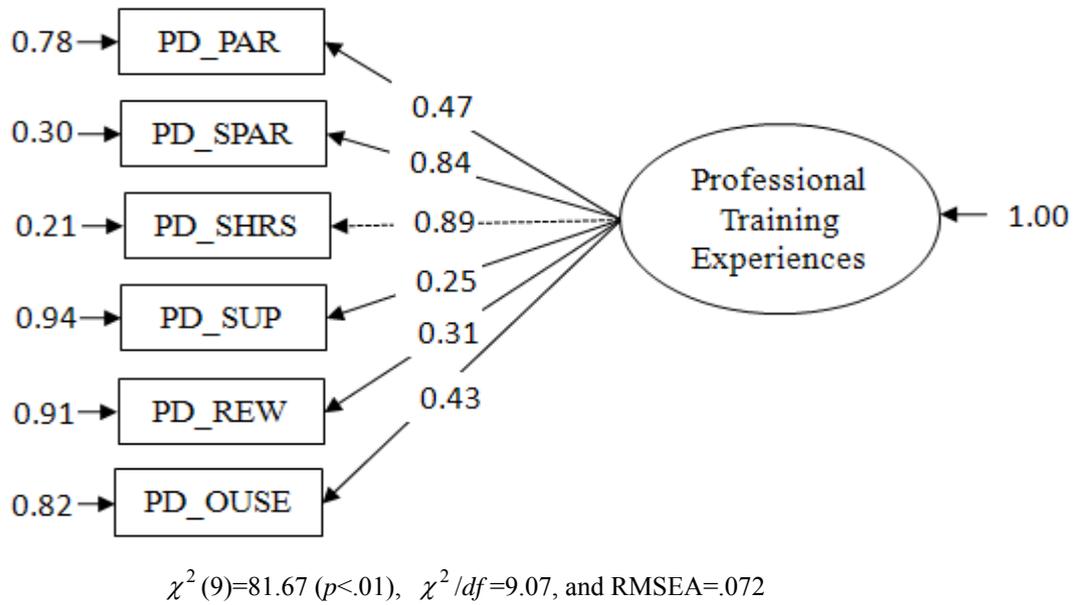


Figure 3.8 The First Revised One-Factor Model for Professional Training Experiences

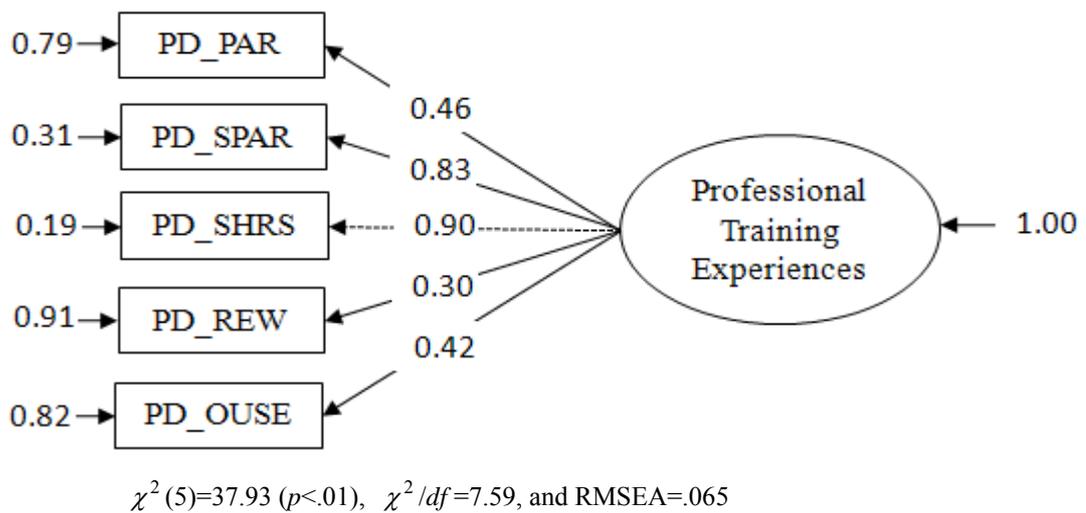


Figure 3.9 Results of the Second Revised One-Factor Model for Professional Training Experiences

Table 3.30 Descriptive Statistics of Variables Considered for Structural Equation Modeling

Variables	All			Leavers			Stayers		
	Mean	SD	Min/ Max	Mean	SD	Min/ Max	Mean	SD	Min/ Max
<b>Actual turnover (AT)</b>	.05	.22	0/1						
<b>Turnover Intention (IT)</b>									
Plan to remain in teaching (R_T340)	1.98	1.1	1/5	3.21	1.26	1/5	1.91	1.05	1/5
Would become a teacher again (T339)	2.03	1.17	1/5	3.01	1.22	1/5	1.97	1.14	1/5
<b>Job satisfaction (JS)</b>									
I am generally satisfied with being a teacher (R_T320)	3.47	.71	1/4	2.88	1.04		3.50	.67	1/4
I sometimes feel it is a waste of time to try to do my best as a teacher (T318)	3.44	.87	1/4	2.80	1.14	1/4	3.47	.82	1/4
<b>Salary (SL)</b>									
Academic base salary (SL_BASE)	3.78	1.13	1.5/ 8.5	3.36	.88	1.5/ 6.8	3.80	1.14	1.5/ 8.55
<b>Working Conditions (WC)</b>									
Student Misbehavior (WC_SM)	21.61	3.57	6/24	18.85	4.72	6/24	21.76	3.43	6/24
Family/Parental Support (WC_PS)	18.37	5.06	7/28	17.06	5.17	7/28	18.44	5.04	7/28
Principal Leadership/ Administrative Support (WC_AS)	18.59	3.99	6/24	17.68	4.70	6/24	18.64	3.94	6/24
Teacher Control in Classroom (WC_TC)	16.55	2.80	4/20	16.89	2.56	5/20	16.53	2.82	4/20
Teacher Influence in School Policy (WC_TI)	6.72	2.68	3/15	6.57	2.48	3/14	6.73	2.69	3/15
<b>Professional Training Experiences (PD)</b>									
participation of professional development activities (PD_PAR)	4.01	1.78	0/9	3.93	1.75	0/8	4.02	1.78	0/9
participation of content-related topical areas (PD_SPAR)	3.87	1.53	0/6	3.60	1.62	0/6	3.88	1.52	0/6
participation hours of topical areas (PD_SHRS)	7.64	4.44	0/23	6.54	4.15	0/21	7.70	4.45	0/23
Rewards after completions of activities (PD_REW)	0.75	0.78	0/3	.68	.74	0/3	.75	.78	0/3
Overall usefulness of professional training experiences (PD_OUSE)	3.69	0.91	1/5	3.50	.94	1/5	3.70	.91	1/5

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Academic base salary (SL\_BASE) was rescaled to measure in ten thousands of dollars.

3. Indicators for working conditions were total scale scores, summing each item of the corresponding indicator.

## Exploration of the Measurement Model

After exploring the factor structures of interest between indicators (observed variables) and corresponding constructs in the study, a total of 16 indicators for six latent variables were confirmed for structural equation model building as shown in Table 3.30. The measurement model (relationships between observed variables and latent variables) was analyzed before the structural model (relationships between latent variables). The logic of this argument is that it is essential to understand what one is measuring prior to testing structural relationships (Jöreskog & Sörbom, 1993).

### Preliminary Analysis

Preliminary analyses focusing on assessment of univariate normality and multicollinearity were performed to examine any violations of assumptions required for structural equation modeling. To check assumptions of univariate normality, skewness and kurtosis values of observed variables were investigated. Overall, absolute kurtosis values of more than 3.0 can affect the fit of the SEM model (Kline, 2005). As shown in Table 3.31, there were no kurtosis values greater than 3, suggesting no severe deviations from normality.

Table 3.31 Assessment of Univariate Normality and Multicollinearity

Constructs	Indicators	Normality Statistics		Collinearity Statistics*	
		Skewness	Kurtosis	Tolerance	VIF
Actual Turnover	ATO	2.053	2.217		
Turnover Intention	R_T340	.840	-.370	.685	1.460
	T339	.741	-.603	.644	1.552
Job Satisfaction	R_T320	-1.219	1.122	.562	1.781
	T318	-1.118	-.036	.724	1.382
Salary	SL_BASE	1.090	1.190	.953	1.049
Working Conditions	WC_SM	-.887	-.229	.728	1.373
	WC_PS	-.005	-.630	.681	1.469
	WC_AS	-.732	.015	.617	1.620
	WC_TC	-1.110	1.826	.885	1.130
	WC_TI	.574	-.084	.839	1.192
Professional Training Experiences	PD_PAR	.277	-.416	.762	1.313
	PD_SPAR	-.350	-.609	.412	2.427
	PD_SHRS	.706	.117	.393	2.546
	PD_REW	.801	.193	.872	1.147
	PD_OUSE	-.455	-.058	.768	1.302

Note: \* Dependent Variable is actual turnover

To check for multicollinearity problems, the correlation coefficients, tolerance, and variance inflation factor (VIF) were inspected. Correlation estimates of .85 or higher, tolerance values of less than .1, and/or VIFs of greater than 10 at the multivariate level might result in a multicollinearity problem in the SEM analysis (Kline, 2005). Absolute correlation coefficients among observed variables ranged from .007 to .749 (See Table 3.32), indicating no problem with bivariate multicollinearity. The tolerance value ranged from .393 to .953 and the VIF ranged from 1.049 to 2.546, indicating no multicollinearity problem at the multivariate level (See Table 3.31).

Table 3.32 Correlations among Observed Variables

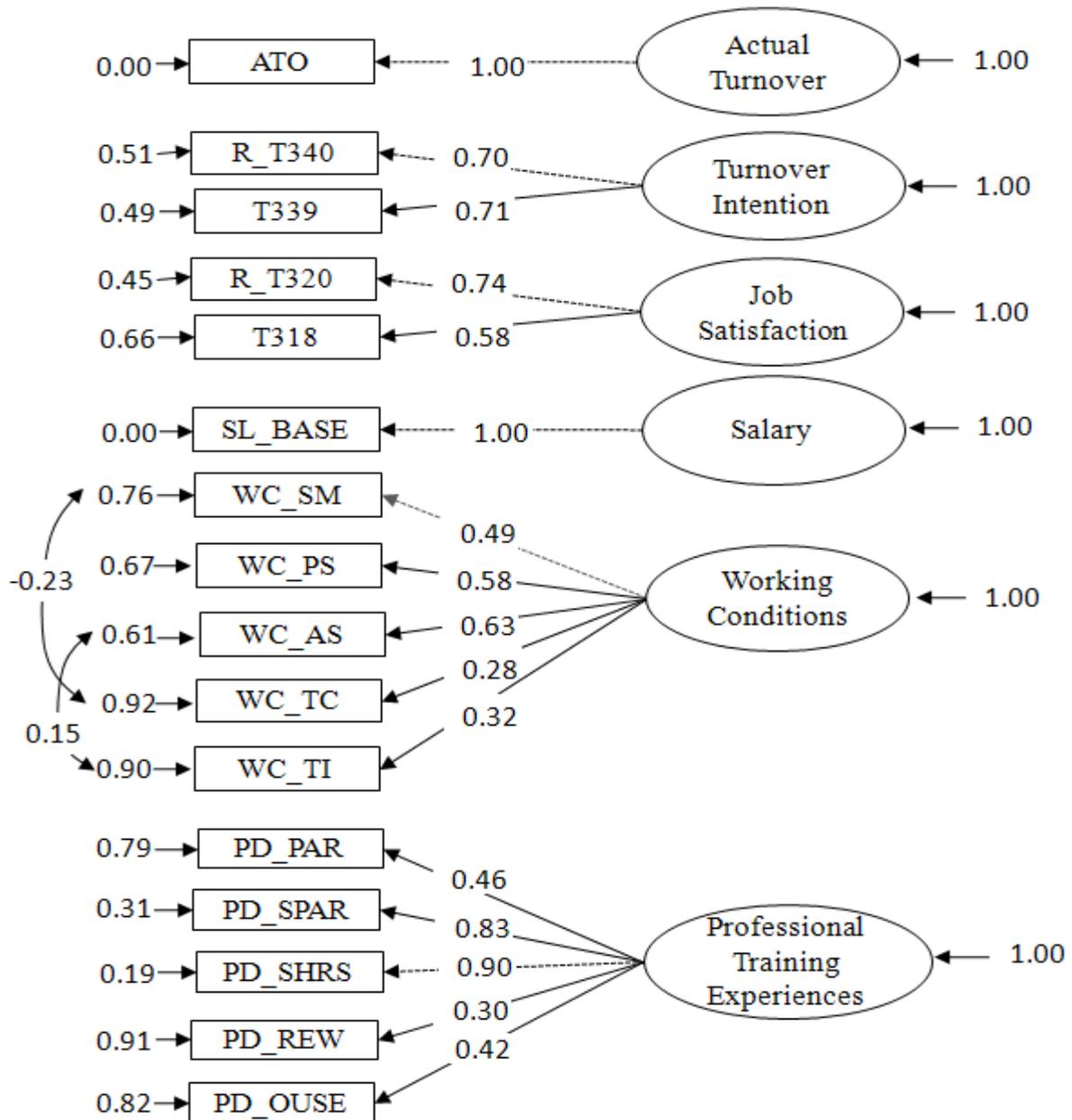
	ATO	R_ T340	T339	R_ T320	T318	SL_ BASE	WC_ SM	WC_ PS	WC_ AS	WC_ TC	WC_ TI	PD_ PAR	PD_ SPAR	PD_ SHRS	PD_ REW
ATO	--														
R_ T340	.261	--													
T339	.196	.498	--												
R_ T320	-.195	-.385	-.386	--											
T318	-.170	-.311	-.372	.431	--										
SL_ BASE	-.087	-.053	.057	.079	.027	--									
WC_ SM	-.180	-.167	-.134	.241	.226	.039	--								
WC_ PS	-.060	-.184	-.210	.337	.296	.048	.447	--							
WC_ AS	-.053	-.206	-.165	.508	.259	-.045	.241	.295	--						
WC_ TC	.028	-.038	-.118	.174	.116	-.039	-.094	.120	.207	--					
WC_ TI	-.013	-.113	-.182	.213	.186	-.059	.091	.168	.348	.146	--				
PD_ PAR	-.010	-.040	-.095	.068	.095	-.056	.023	-.070	.102	.090	.107	--			
PD_ SPAR	-.040	-.075	-.046	.069	.086	.046	.134	-.060	.146	-.052	.124	.362	--		
PD_ SHRS	-.057	-.068	.011	.056	.048	.020	.123	-.064	.095	-.021	.051	.402	.749	--	
PD_ REW	-.021	.007	-.007	.079	.007	-.050	.061	.041	.138	.040	.077	.280	.222	.266	--
PD_ OUSE	-.048	-.188	-.171	.177	.170	-.037	.101	.074	.258	.099	.157	.270	.343	.368	.180

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. Correlation coefficients were all significant at the .05 level.

### Evaluation of the Measurement Model Fit

The measurement model was run including both the exogenous variables (SL=salary, WC=working conditions, and PD=professional training experiences) and endogenous variables (JS=job satisfaction, IT=turnover intention, and AT=actual turnover) without any structural relationships. Maximum likelihood was used as the estimation method. Figure 3.10 displays the measurement model.



$\chi^2(89)=383.35$  ( $p<.01$ ),  $\chi^2/df=4.31$ , and RMSEA=.046

Figure 3.10 The Measurement Model<sup>24</sup>

The initial measurement model fit indices were all satisfactory except for the chi-square statistic. The  $\chi^2$  measure of model fit was 383.35 ( $df=89$ ), which is too large to reject

<sup>24</sup> As discussed earlier, two pairs of indicators in working conditions (WC\_SM and WC\_TC, WC\_AS and WC\_TI) were allowed to estimate error covariance. In addition, error variances of each of the two single indicators (ATO for AT and SL\_BASE for SL) were set to zero (i.e., standardized factor loadings were equal to 1).

the null of a good fit ( $p < .01$ ). The normed chi-square ( $\chi^2/df$ ) was 4.31 and the RMSEA was .046, indicating that both are small enough to indicate a good fit. The chi-square statistic showed that the models were significant ( $p < .01$ ), indicating that the model specification for factor loadings, factor variances/covariances, and error variances might be problematic. As mentioned earlier, however, this is not uncommon, as the chi-square statistic is sensitive to large sample sizes (Hair et al., 1998).

As shown in Table 3.33, the estimated correlations among constructs were widely scattered, ranging from -.002 to .854. Job satisfaction and working conditions were highly and positively correlated ( $r = .854$ ), while correlations between salary and other factors were low and most of them were not significant at the .05 level. Correlations between salary and turnover intention, salary and working conditions, and salary and professional training experiences were not significant at the .05 level.

Table 3.33 Correlations among Latent Constructs

Constructs	AT	IT	JS	SL	WC	PD
Actual Turnover (AT)	--					
Turnover Intention (IT)	.322**	--				
Job Satisfaction (JS)	-.272**	-.765**	--			
Salary (SL)	-.087**	.005	.089**	--		
Working Conditions (WC)	-.138**	-.450**	.854**	-.002	--	
Professional Training Experiences (PD)	-.059**	-.087**	.127**	.021	.133**	--

Notes: 1. Weighted N=237,530, unweighted N=1,563

2. \*\*  $p < .05$

### Assessment of Validity and Reliability of Constructs and Indicators

Once the overall fit of the measurement model was successfully estimated, construct reliability and validity were assessed. Table 3.34 shows construct validity, error variances, Cronbach's alpha (internal consistency), and construct reliability. Construct validity was evaluated by examining the standardized factor loadings within the latent constructs as well

as the correlations between the constructs (Anderson & Gerbing, 1988). As shown in Table 3.34, the standardized factor loadings on all latent constructs ranged from .275 to .883 and were significant at the level of .05. Error variances for indicators ranged from .107 (PD\_SHRS) to .725 (WC\_TC).

Table 3.34 Reliabilities and Validities for Constructs and Indicators

Construct/ Indicator	Construct Validity	Error Variance	Indicator Reliability	Cronbach Alpha	Construct Reliability
<b>Actual Turnover (AT)</b>					
ATO	1.000	.000	1.000		
<b>Turnover Intention (IT)</b>				.664	.665
R_T340	.697	.514	.486		
T339	.714	.490	.510		
<b>Job Satisfaction (JS)</b>					
R_T320	.743	.448	.552	.593	.612
T318	.580	.664	.336		
<b>Salary (SL)</b>					
SL_BASE	1.000	.000	1.000		
<b>Working Conditions (WC)</b>				.564	.575
WC_SM	.486	.764	.236		
WC_PS	.578	.666	.334		
WC_AS	.626	.608	.392		
WC_TC	.275	.924	.076		
WC_TI	.322	.896	.104		
<b>Professional Training Experiences (PD)</b>		1.000		.625	.737
PD_PAR	.459	0.789	.211		
PD_SPAR	.832	0.308	.692		
PD_SHRS	.893	0.203	.797		
PD_REW	.305	0.907	.093		
PD_OUSE	.425	0.819	.181		

Indicator reliability (the square of the standardized factor loading), analogous to  $R^2$  in linear regression, indicates the percent of the variation in the variable explained by the construct that it is supposed to measure. Some of the indicators were reliable, while some had low reliability. It is important that each construct have at least one, preferably more, reliable indicators (Hair et al., 1998). For example, WC\_TC (teacher control in their classroom) was the weakest indicator for working conditions (.076), while WC\_AS (principal leadership/administrative support) was the highest indicator (.392).<sup>25</sup>

<sup>25</sup> The low indicator reliability of working conditions might be due to the correlated error covariance WC\_SM and WC\_TC, and WC\_AS and WC\_TI as mentioned earlier in the factor structure of working conditions.

In professional training experiences, PD\_REW (rewards for the completion of PD activities) was the lowest reliability of .093, while PD\_SPAR (professional development participation in content-related topical areas) and PD\_SHRS (participation hours in content-related topical areas) were highly reliable at .692 and .797, respectively.

Cronbach's alpha used to measure internal consistency, and ranged from .564 to .664. These coefficients above .6 were considered to be internally consistent.<sup>26</sup> Though alpha coefficient of working conditions was .564, this was not considered problematic since the study allowed the correlated error variance (Helms, Henze, Sass, & Mifsud, 2006).

Construct reliability<sup>27</sup> based on standardized factor loadings, a statistic that measures the amount of scale score variance that is accounted for by all underlying factors, was between .575 and .737 and close to the acceptable threshold (Hair et al., 1998).

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<sup>26</sup> While Cronbach's alpha above .70 is recommended, the coefficient above .6 is widely accepted as a cut-off point (Bernardi, 1994; Netemeyer, Bearden, & Sharma, 2003).

<sup>27</sup> A construct reliability of 0.7 or greater is considered good and between 0.6 and 0.7 is acceptable. The formula for construct reliability as follows;  $(\sum \text{standardized factor loading})^2 / (\sum \text{standardized factor loading})^2 + \sum (\text{error variance})$ .

## **CHAPTER IV**

### **RESULTS**

The chapter first reports on tests of the relative importance of factors affecting job satisfaction, turnover intention, and actual turnover. Next, it presents findings from the examination of possible mediating effects of job satisfaction and turnover intention. Finally, results of tests for differences in the strength of structural relationships are presented that examine how such relationships vary according to teacher and school characteristics.

#### **Tests of the Relative Weights**

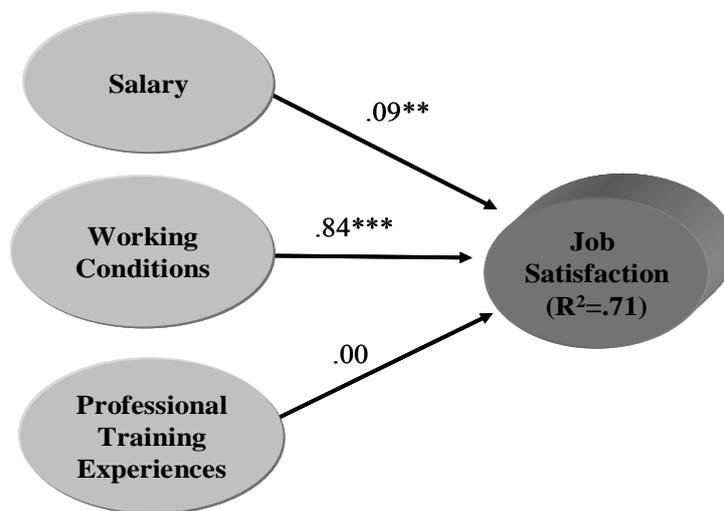
The relative direct effects of three independent variables on each of the three dependent variables were separately tested with maximum likelihood estimation. First, the effects of salary, working conditions, and professional training experiences on job satisfaction were examined (Hypothesis 1a: Salary, working conditions, and professional training experiences will have a positive direct impact on teachers' job satisfaction). Second, the associations of these three independent variables with turnover intention were examined (Hypothesis 1b: Salary, working conditions, and professional training experiences will have a negative direct impact on teachers' turnover intention). Finally, the extent to which these three independent (exogenous) variables are associated with actual turnover was examined (Hypothesis 1c: Salary, working conditions, and professional training experiences will have a negative direct impact on actual turnover behavior).

#### **The Relative Effects of Salary, Working Conditions, and Professional Training Experiences on Job Satisfaction**

The model fit indices indicated an acceptable fit between the data and the model. The chi-square value was  $\chi^2(58) = 300.12$  ( $p < .01$ ),  $\chi^2/df = 5.17$ , and RMSEA = .052. Salary and working conditions positively influenced job satisfaction except for that for professional

training experiences.

As shown in Figure 4.1<sup>28</sup>, the standardized path coefficient from working conditions to job satisfaction, which indicates the impact of working conditions on job satisfaction when holding the other two factors constant, was the largest (standardized coefficient  $\tilde{\beta} = .84$ ,  $t=9.27$ ). This suggested that working conditions are more important to teachers' reported job satisfaction than salary and professional training experiences. The three predictors together accounted for 71% of the variance in job satisfaction ( $R^2 = .71$ ).



$\chi^2 (58)=302.12 (p<.01)$ ,  $\chi^2 /df=5.12$ , and RMSEA=.052

\*  $p<.10$ , \*\* $p<.05$ , \*\*\* $p<.01$

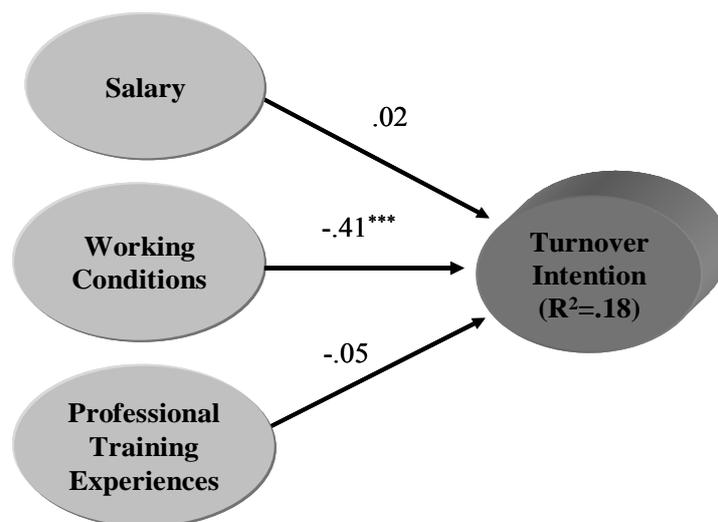
Figure 4.1 Relative Weights of Salary, Working Conditions, and Professional Training Experiences on Job Satisfaction

Overall, these findings partially support Hypothesis 1a: Salary and working conditions, but not professional training experiences had a positive impact on teachers' job satisfaction. Findings indicated that while salary and working conditions explained teachers' job satisfaction in the predicted direction, professional training experiences did not.

<sup>28</sup> Structural models only display standardized path coefficients and correlations among constructs and error variances for structural equations, omitting measurement models for reasons of clarity.

## The Relative Effects of Salary, Working Conditions, and Professional Training Experiences on Turnover Intention

Regarding the structural relationships among salary, working conditions, professional training experiences and turnover intention, the overall model fit to the data was acceptable, where  $\chi^2(58) = 289.74$  ( $p < .01$ ),  $\chi^2/df = 4.99$ , and RMSEA = .051. As indicated in Figure 4.2, only working conditions had a negative and significant association with turnover intention at the .05 level ( $\tilde{\beta} = -.41$ ,  $t = -6.12$ ), indicating that teachers who reported better working conditions were less likely to have intentions to leave the profession. Hypothesis 1b was only partially supported: Working conditions, but salary and professional training experiences, had a negative impact on teachers' turnover intention.



$\chi^2(58) = 289.74$  ( $p < .01$ ),  $\chi^2/df = 4.99$ , and RMSEA = .051

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

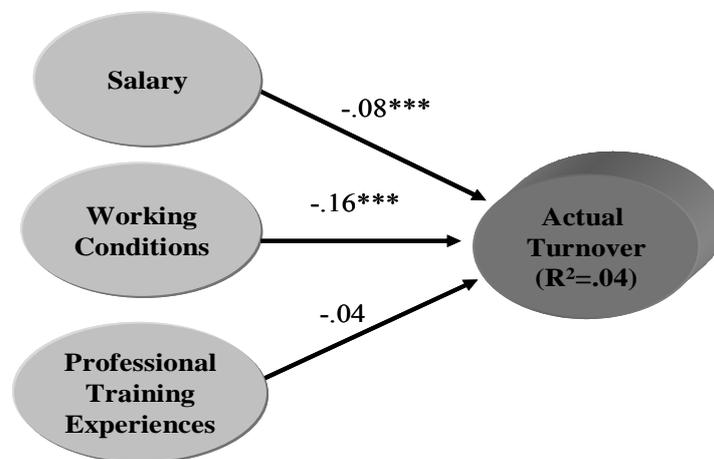
Figure 4.2 Relative Weights of Salary, Working Conditions, and Professional Training Experiences on Turnover Intention

A relatively small portion of variance associated with turnover intention was explained by these three factors ( $R^2 = .18$ ). This may be because the model did not include external factors that likely affect turnover intention and/or actual turnover, such as alternative

job opportunities/offers, job preferences, childrearing (pregnancy), moves, family status, and family income (Hanushek, Kain, & Rivkin, 2004).

### The Relative Effects of Salary, Working Conditions, and Professional Training Experiences on Actual Turnover

The goodness-of-fit indices,  $\chi^2(48) = 213.43$  ( $p < .01$ ),  $\chi^2/df = 4.45$ , and RMSEA = .047, suggested that the model exhibits a good fit with the data. As indicated in Figure 4.3, the standardized path coefficient from salary to actual turnover ( $\tilde{\beta} = -.08$ ,  $t = -3.63$ ) and from working conditions to actual turnover ( $\tilde{\beta} = -.16$ ,  $t = -3.97$ ) were significant and in the predicted direction. Unexpectedly, the impact of professional training experiences was not significantly associated with actual turnover. Overall, these findings only partially support Hypothesis 1c: Salary and working conditions, but not professional training experiences, had a negative impact on teachers' actual turnover.



$\chi^2(48) = 213.43$  ( $p < .01$ ),  $\chi^2/df = 4.45$ , and RMSEA = .047

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Figure 4.3 Relative Weights of Salary, Working Conditions, and Professional Training Experiences on Actual Turnover

In addition, the explained variance associated with the actual turnover model was small ( $R^2 = .04$ ). Low turnover rates (i.e., 5% of the sampled teachers) and external factors

excluded from the model (e.g., alternative job opportunities/offers, job preferences, childrearing) might explain the remaining unexplained by the actual turnover model.

Table 4.1 summarizes the results of the tests of the relative weights models. In sum, working conditions was statistically significant at the .05 level in all three relative weights models and had the largest standardized path coefficients of the three independent variables. In other words, teachers who worked in schools with better working conditions were more likely to be satisfied with their jobs, were less likely to report an intention to leave, and were less likely to leave the teaching profession. Salary had a positive and significant influence on job satisfaction and actual turnover, though the magnitudes of the effects were relatively small compared with working conditions. Professional training experiences did not have a significant impact on any of the dependent variables.

Table 4.1 Summary of the Results of the Relative Weights of Structural Relationships

	Job Satisfaction				Turnover Intention				Actual Turnover			
Overall Model Fit	$\chi^2 (58) = 300.12 (p < .01)$ $\chi^2 /df = 5.17$ RMSEA = .052				$\chi^2 (58) = 289.74 (p < .01)$ $\chi^2 /df = 4.99$ RMSEA = .051				$\chi^2 (48) = 213.43 (p < .01)$ $\chi^2 /df = 4.45$ RMSEA = .047			
$R^2$	.71				.18				.04			
Path Coefficients	$\hat{\beta}$	se	t value	$\tilde{\beta}$	$\hat{\beta}$	se	t value	$\tilde{\beta}$	$\hat{\beta}$	se	t value	$\tilde{\beta}$
Salary	.05	.018	2.53	.09**	.01	.037	.40	.02	-.02	.004	-.363	-.08***
Working Conditions	.28	.030	9.27	.84***	-.14	.024	-6.12	-.41***	-.01	.004	-3.97	-.16***
Professional Training Experiences	.00	.006	.06	.00	-.01	.008	-1.07	-.02	-.00	.001	-.150	.04

- Notes: 1.  $\hat{\beta}$  : an unstandardized path coefficient.  
 2. se: a standard error of each of the path coefficient.  
 3. t values larger than 1.64, 1.96, and 2.58 are significant at the .10, .05, and .01 significance level, respectively.  
 4.  $\tilde{\beta}$  : a standardized path coefficient.  
 5. \*\* $p < .05$ , \*\*\* $p < .01$

### Tests of the Mediating Effects of Job Satisfaction and Turnover Intention

To test the hypothesized path relationships associated with the mediating effect model, a series of structural equation models was run using maximum likelihood estimation

(Joreskog & Sorbom, 1993). These analyses were conducted to examine the associations among latent variables mediated by job satisfaction and turnover intention, which have not been well explored in the earlier literature.

First, the mediating effect of job satisfaction was analyzed to examine whether it affects the association between each of the three factors – salary, working conditions, and professional training experiences – and turnover intention (Hypothesis 2a). Second, the mediating effect of job satisfaction on the association of each of the three factors and actual turnover behavior (Hypothesis 2b) was explored. Third, the mediating effect of turnover intention on the association of each of the three factors and actual turnover behavior (Hypothesis 2c) was examined. Finally, the mediating effect of turnover intention was examined to understand whether it affects the relationship between job satisfaction and actual turnover (Hypothesis 2d).

To test for possible mediating effects, the study examined the baseline model and two nested models displaying the relationships among predictors, mediators, and dependent variables: (1) Model 1 without mediation (i.e., no path from the mediator to the dependent variable), (2) Model 2 with partial mediation (i.e., estimation of all paths among the predictor, the mediator, and the dependent variable), and (3) Model 3 with full mediation (i.e., estimation of the path from the predictor to the mediator and the path from the mediator to the dependent variable). Figures 4.4, 4.5, and 4.6 illustrate the hypothesized mediating effect of job satisfaction on the association between salary and turnover intention.

Figure 4.4, for example, depicts a non-mediated model in which each of the three factors is hypothesized to directly impact job satisfaction, and salary is expected to directly influence intent to leave, and overall job satisfaction is not hypothesized to impact intent to leave. It is reasonable to posit the non-mediated model since both the fully mediated and partially mediated models are being estimated, and the non-mediated model is nested within the fully mediated model.

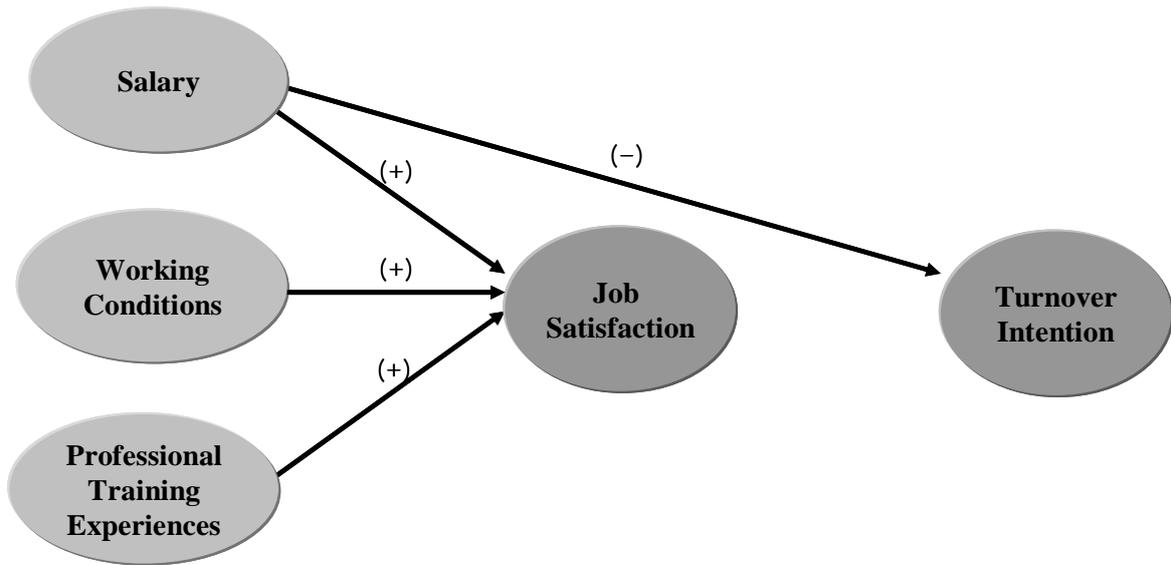


Figure 4.4 Non-Mediated Model of Job Satisfaction

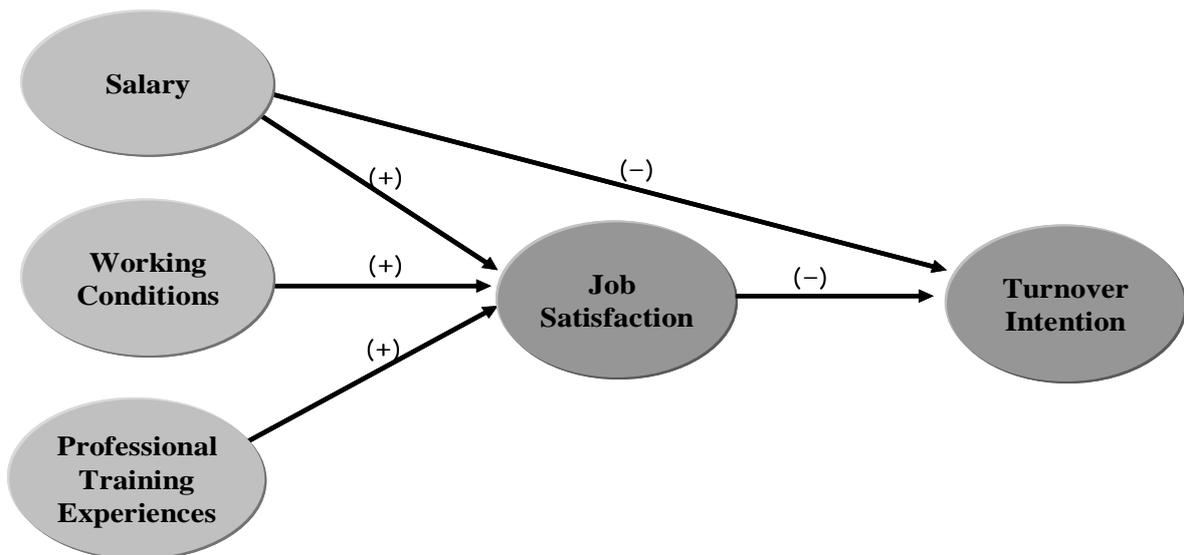


Figure 4.5 Partially Mediated Model of Job Satisfaction

As a baseline model displayed in Figure 4.5, Model 2 adds the path from the mediator (job satisfaction) to dependent variable (turnover intention) to Model 1. This model includes all the paths among the predictor (e.g., salary), the mediator (e.g., job satisfaction), and the dependent variable (e.g., turnover intention). Often called the “partially mediated model,” Model 2 illustrates that job satisfaction only partially mediates the relationship between salary and intent to leave as compared with Model 1.

Model 3, often called “fully mediated model,” does not include the path from the job-related predictors (e.g., salary) and the dependent variable (e.g., turnover intention) (Arvey, Rotundo, Johnson, Zhang, & McGue, 2006; Clugston, 2000). As illustrated in Figure 4.6, Model 3 predicts that each of the three factors will affect job satisfaction which in turn affects turnover intention. The fit of Model 3 would be compared with Model 2 as it is a nested model. However, Model 1 and Model 3 cannot be compared in terms of chi-square differences because they are not nested models.

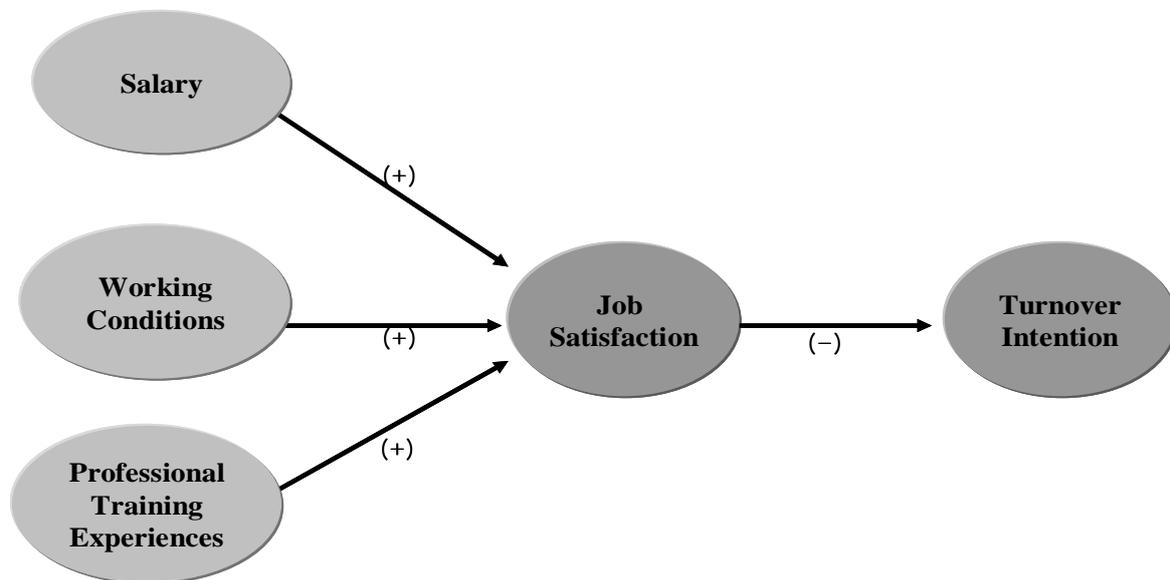


Figure 4.6 Fully Mediated Model of Job Satisfaction

As shown in Model 2 and 3, a mediator variable represents an intervening variable or stated differently, a variable that explains how or why a relationship exists between the predictor and dependent variable. Before testing for a mediating effect, there must be a significant direct relationship between the predictor and the dependent variable (Baron & Kenny, 1986). The mediating effect was tested by assessing and comparing the overall model fit of each of three models and the chi-square differences between the partially mediated model (Model 2) and each of the nested models (Model 1 and Model 3).

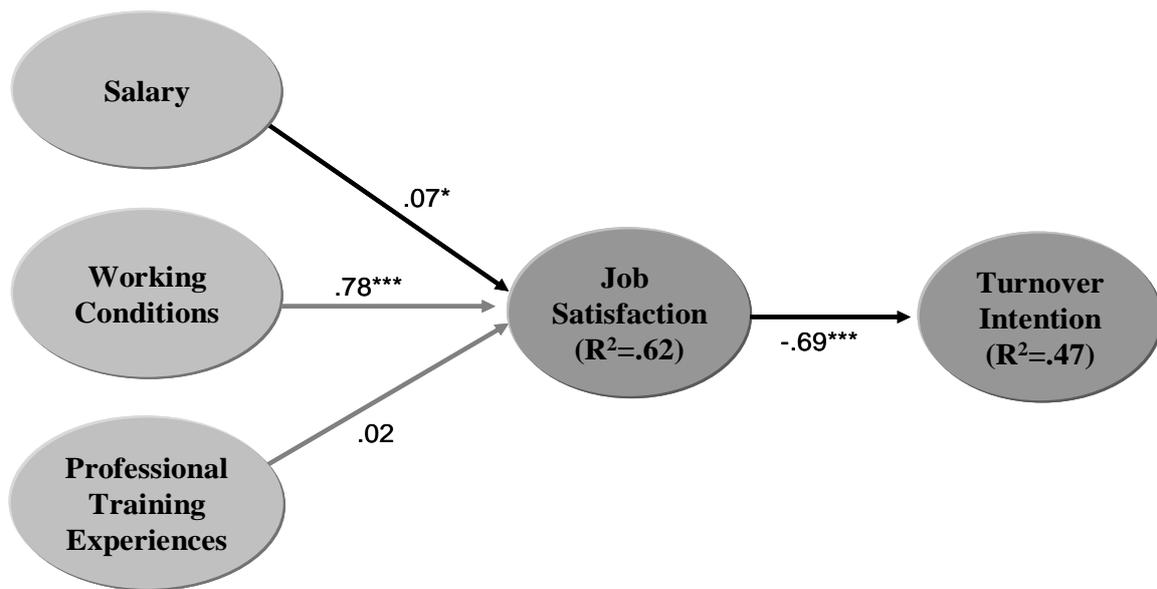
## The Impact of Salary on Turnover Intention Mediated by Job Satisfaction

The mediating effect of job satisfaction on the relationship between salary and turnover intention was tested based on comparisons of the three models as illustrated above. Table 4.2 shows comparisons of the three models including the results of the likelihood ratio tests. The chi-square difference between Model 1 and Model 2 was 386.86 with one degree of freedom ( $p < .01$ ), suggesting improvement of the model fit due to the addition of the path from job satisfaction (predictor) to turnover intention (dependent variable). The chi-square difference between Model 3 and Model 2 was 1.35 with one degree of freedom ( $p > .05$ ), suggesting that there is no improvement of model fit due to the addition of the path from salary to turnover intention. In addition, Model 3 had a slightly better model fit than Model 2, in terms of the ratio of chi-square to degrees of freedom ( $\chi^2/df = 4.718$ ). Overall, the fully mediated model of job satisfaction (Model 3) appeared to provide a better fit than did the two nested models.

Table 4.2 Fit Indices for the Mediating Model of Job Satisfaction on the Effect of Salary on Turnover Intention

Hypothesized Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model 1 (non-mediated)	630.55	82	<.01	7.690	.065
Model 2 (partially mediated)	385.51	81	<.01	4.759	.049
Model 3 (fully mediated)	386.86	82	<.01	4.718	.049
$\chi^2_{\text{difference}}$ (Model1-Model2)	245.04	1	<.01		
$\chi^2_{\text{difference}}$ (Model3-Model2)	1.35	1	>.05		

As illustrated in Figure 4.7, the standardized path coefficients from salary to job satisfaction, however, was not significant at the .05 level ( $\tilde{\beta} = .07, t = 1.93$ ). Thus, it could not be concluded that job satisfaction fully mediates the association between salary and turnover intention. The results did not support part of Hypothesis 2a that stated that the impact of salary on turnover intention was mediated by job satisfaction.



$\chi^2(82)=386.86$  ( $p<.01$ ),  $\chi^2/df=4.718$ , and  $RMSEA=.049$   
 \*  $p<.10$ , \*\* $p<.05$ , \*\*\* $p<.01$

Figure 4.7 Fully Mediated Model of Job Satisfaction Mediating the Effect of Salary on Turnover Intention

### The Impact of Working Conditions on Turnover Intention Mediated by Job Satisfaction

The mediating effect of job satisfaction on the relationship between working conditions and turnover intention was tested the same way. Among the three models, Model 1 (the non-mediated model) failed to reach a solution due to an estimated negative error variance of job satisfaction. Thus, Model 2 was compared with Model 3.

As indicated in Table 4.3, the chi-square difference between Model 3 and Model 2 was 12.09 with one degree of freedom ( $p<.01$ ), suggesting model fit improvement due to the addition of the path from working conditions (predictor) to turnover intention (dependent variable). In addition, other fit indices showed that Model 2 fit was better than Model 3, where  $\chi^2(81)=374.77$  ( $p<.01$ ),  $\chi^2/df=4.627$ , and  $RMSEA=.048$ . Overall, the partially mediated model of job satisfaction appears to provide a superior fit, compared with Models 1 and 3.

Table 4.3 Fit indices for the Mediating Model of Job Satisfaction on the Effect of Working Conditions on Turnover Intention

Hypothesized Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model 1 (non-mediated)			Failure of model estimation		
Model 2 (partially mediated)	374.77	81	<.01	4.627	.048
Model 3 (fully mediated)	386.86	82	<.01	4.718	.049
$\chi^2_{difference}$ (Model3-Model2)	12.09	1	<.01		

Figure 4.8 shows the partially mediated model of job satisfaction mediating the association between working conditions and turnover intention. As displayed in Figure 4.8, working conditions had a positive direct impact on job satisfaction ( $\tilde{\beta} = .84, t=9.36$ ) and on turnover intention ( $\tilde{\beta} = .66, t=2.26$ ) at the .05 level. Job satisfaction had a negative direct effect on turnover intention ( $\tilde{\beta} = -1.32, t= -4.21$ ).<sup>29</sup>

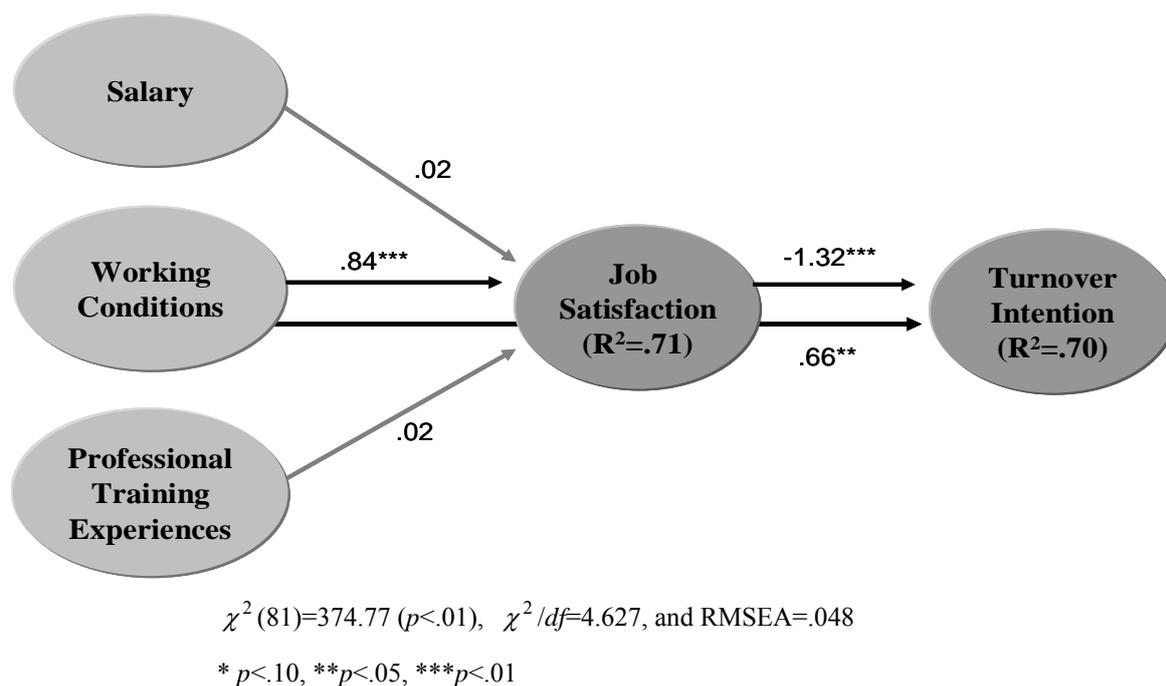


Figure 4.8 Partially Mediated Model of Job Satisfaction Mediating the Effect of Working Conditions on Turnover Intention

<sup>29</sup> The standardized path coefficients from job satisfaction and turnover intention were greater than one, suggesting the need to inspect for multicollinearity. However, no evidence of collinearity among factors was found from the multicollinearity checks using tolerance and VIF (Variance Inflation Factor).

The indirect effect of working conditions on turnover intention mediated by job satisfaction was negative and significant ( $-1.32 \times .84 = -1.108$ ,  $t = -3.646$ ). The results supported part of Hypothesis 2a that stated that working conditions had both a direct and indirect impact on turnover intention.

The impact of professional training experiences on turnover intention mediated by job satisfaction was not tested because the path coefficient from professional training experiences to job satisfaction was not significant in Models 1 and 3. In sum, working conditions had a direct and indirect effect on turnover intention mediated by job satisfaction.

### **The Impact of Salary on Actual Turnover Mediated by Job Satisfaction**

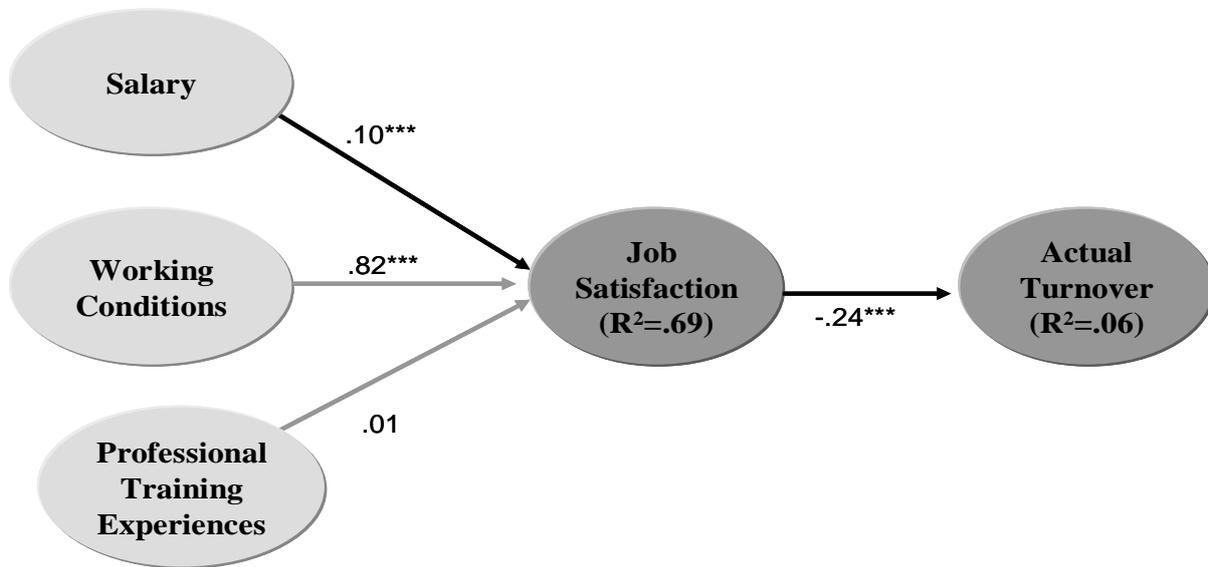
The mediating effect of job satisfaction on the relationship between salary and actual turnover was tested. Table 4.4 shows comparisons of the three models, including the results of the likelihood ratio tests. The results showed that the fully mediated model has a better fit than alternative models. Specifically, the chi-square difference between Model 1 and Model 2 was significant ( $p < .01$ ), suggesting the improvement of the model fit by adding the path from job satisfaction (mediator) to actual turnover (dependent variable). However, the chi-square difference between Model 3 and Model 2 could not be compared because the negative value of chi-square difference. Model fit indices of Model 3 indicated a better fit than those for Model 2.

Table 4.4 Fit Indices for the Mediating Model of Job Satisfaction on the Effect of Salary on Actual Turnover

<b>Hypothesized Model</b>	$\chi^2$	<i>df</i>	<i>p</i> value	$\chi^2/df$	<b>RMSEA</b>
Model 1 (non-mediated)	334.24	70	<.01	4.775	.049
Model 2 (partially mediated)	308.82	69	<.01	4.476	.047
Model 3 (fully mediated)	305.82	70	<.01	4.369	.046
$\chi^2_{difference}$ (Model1-Model2)	25.42	1	<.01		
$\chi^2_{difference}$ (Model3-Model2)	-3	1			

Figure 4.9 displays that job satisfaction fully mediated the effect of salary on actual

turnover. The standardized path coefficients from salary to job satisfaction was significant at the .05 level ( $\tilde{\beta} = .10, t = 2.71$ ). Job satisfaction had a negative direct effect on actual turnover ( $\tilde{\beta} = -.24, t = -5.13$ ).



$\chi^2(70)=305.82 (p<.01), \chi^2/df=4.369, \text{ and RMSEA}=.046$

\*  $p<.10, **p<.05, ***p<.01$

Figure 4.9 Fully Mediated Model of Job Satisfaction Mediating the Effect of Salary on Actual Turnover

The indirect effect of salary on actual turnover mediated by job satisfaction was negative and significant ( $.10 * -.24 = -.024, t = -2.368$ ). We could say that teachers who received higher base salary were more likely to be satisfied and less likely to leave the profession. The results supported part of Hypothesis 2b that stated that job satisfaction mediated the association between salary and actual turnover.

### The Impact of Working Conditions on Actual Turnover Mediated by Job Satisfaction

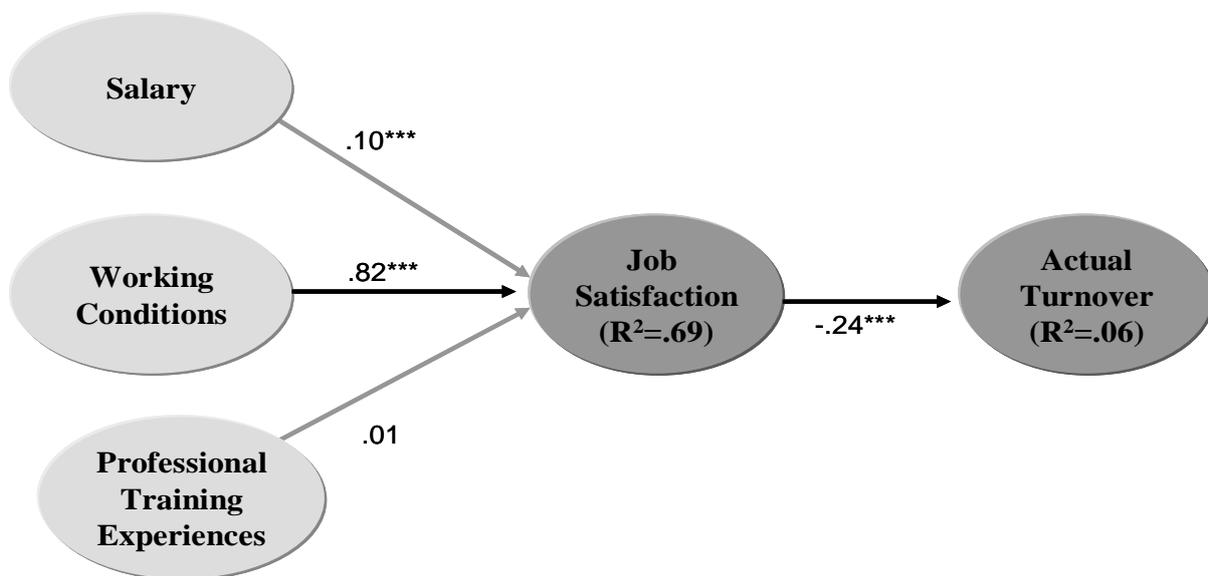
The mediating effect of job satisfaction on the relationship between working conditions and actual turnover was tested. Table 4.5 shows the results of model comparisons, indicating that the fully mediated model had a better fit. The chi-square difference between Model 1 and Model 2 was significant; however, the chi-square difference between Model 3

and Model 2 was not significant, suggesting that there is no improvement of model fit by adding the path from salary (predictor) to actual turnover (dependent variable) on Model 3. Overall, fit indices indicated that model fit of the fully mediated model was better than other two models.

Table 4.5 Fit Indices for the Mediating Model of Turnover Intention on the Effect of Salary on Actual Turnover

Hypothesized Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model 1 (non-mediated)	316.58	70	<.01	4.523	.047
Model 2 (partially mediated)	303.67	69	<.01	4.401	.047
Model 3 (fully mediated)	305.82	70	<.01	4.369	.046
$\chi^2$ difference (Model1-Model2)	12.91	1	<.01		
$\chi^2$ difference (Model3-Model2)	2.15	1	>.05		

Figure 4.10 shows that job satisfaction fully mediated the effect of working conditions on actual turnover. The standardized path coefficients from working conditions to job satisfaction was significant ( $\tilde{\beta} = .82, t = 9.47$ ). Job satisfaction had a negative direct effect on actual turnover ( $\tilde{\beta} = -.24, t = -5.13$ ).



$\chi^2(70)=305.82 (p<.01), \chi^2/df=4.369, \text{ and } RMSEA=.046$

\*  $p<.10, **p<.05, ***p<.01$

Figure 4.10 Fully Mediated Model of Job Satisfaction Mediating the Effect of Working Conditions on Actual Turnover

The indirect effect of working conditions on actual turnover mediated by job satisfaction was negative and significant ( $.82 * -.24 = -.197, t = -4.83$ ). We could say that teachers who worked at schools with better working conditions were more likely to be satisfied and less likely to leave teaching. When teachers' perceptions about their working conditions increase by one standard deviation, teachers' decisions to leave decrease by .197 standard deviation. The results supported part of Hypothesis 2b that stated that job satisfaction mediated the association between working conditions and actual turnover.

The impact of professional training experiences on actual turnover mediated by job satisfaction was not tested because the path coefficient from professional training experiences to job satisfaction was not significant in Models 1 and 3. In sum, salary and working conditions had an indirect effect on actual turnover mediated by job satisfaction.

### **The Impact of Salary on Actual Turnover Mediated by Turnover Intention**

The mediating effect of turnover intention on the relationship between salary and actual turnover was tested. Table 4.6 shows comparisons of the three models, including the results of the likelihood ratio tests. Overall fit of the three models to the data were acceptable as indicated Table 4.6.

Table 4.6 Fit Indices for the Mediating Model of Turnover Intention on the Effect of Salary on Actual Turnover

<b>Hypothesized Model</b>	$\chi^2$	<i>df</i>	<i>p</i> value	$\chi^2/df$	<b>RMSEA</b>
Model 1 (non-mediated)	346.86	70	<.01	4.955	.050
Model 2 (partially mediated)	292.11	69	<.01	4.233	.045
Model 3 (fully mediated)	292.82	70	<.01	4.183	.045
$\chi^2_{difference}$ (Model1-Model2)	54.75	1	<.01		
$\chi^2_{difference}$ (Model3-Model2)	0.71	1	>.05		

The chi-square difference between Model 1 and Model 2 was significant, suggesting the improvement of the model fit by adding the path from turnover intention (mediator) to actual turnover (dependent variable); however, the chi-square difference between Model 3

and Model 2 was not significant, suggesting that there is no improvement of model fit by adding the path from salary (predictor) to actual turnover (dependent variable) on Model 3. Overall, fit indices indicated that the model fit of the fully mediated model of turnover intention was better than the partially mediated model.

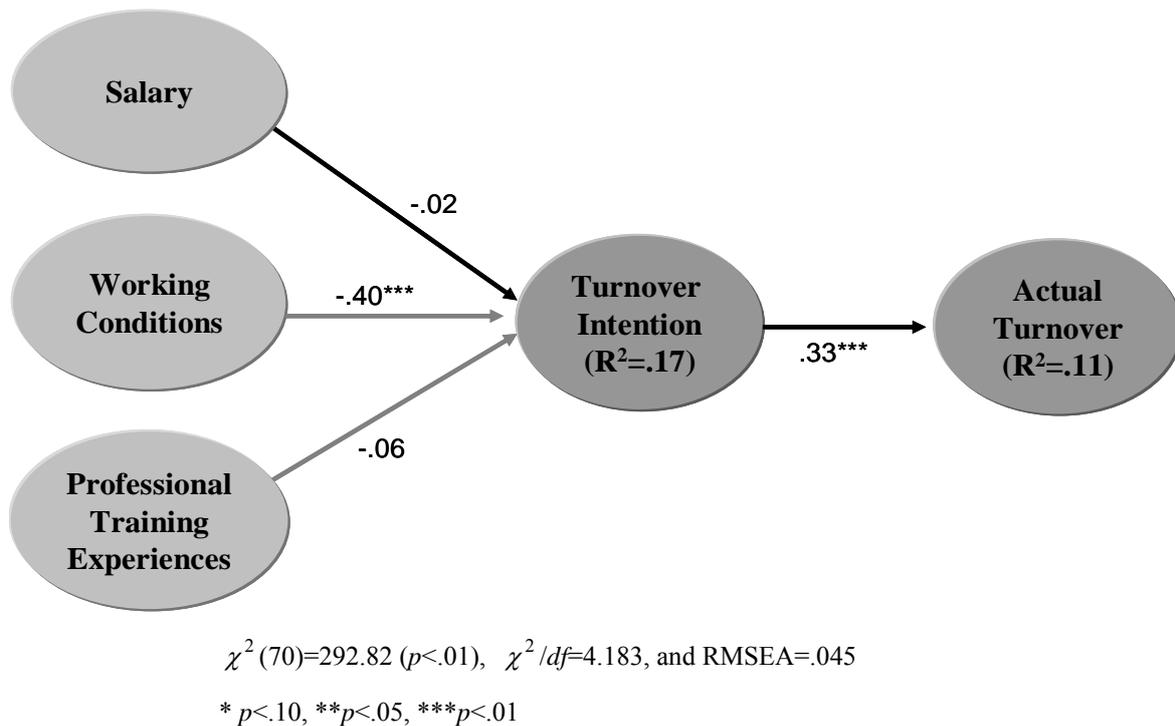


Figure 4.11 Fully Mediated Model of Turnover Intention Mediating the Effect of Salary on Actual Turnover

Figure 4.11 presents the standardized path coefficients for the fully mediated model of turnover intention on the association between salary and actual turnover (Model 3). The direct impact of salary on turnover intention was not significant. A result did not support part of Hypothesis 2c that stated that the impact of salary on actual turnover was mediated by turnover intention.

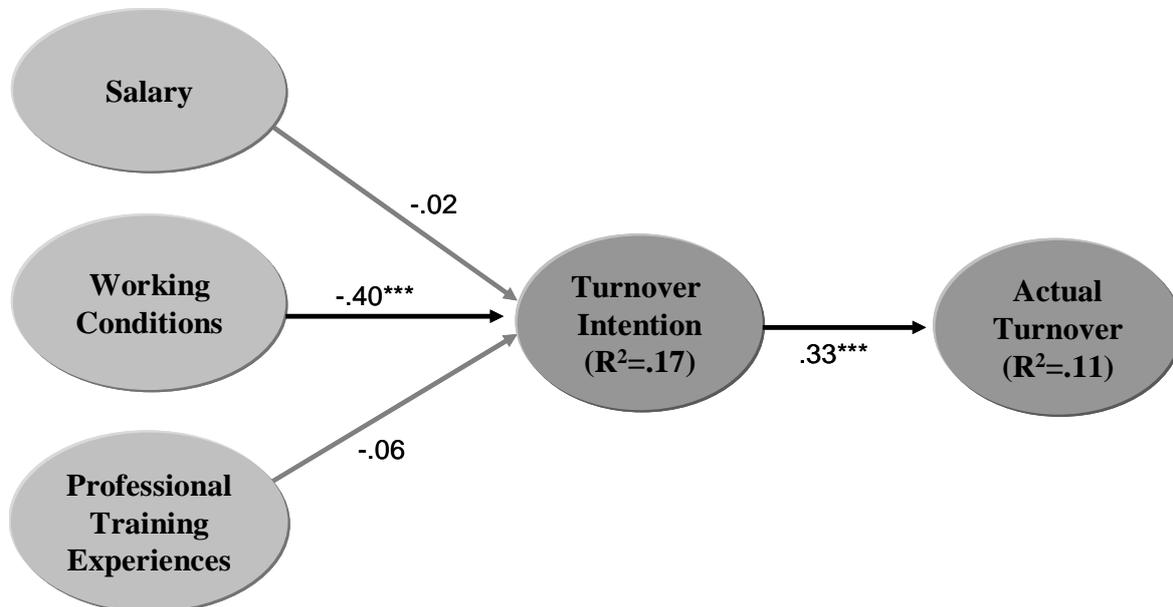
### The Impact of Working conditions on Actual Turnover Mediated by Turnover Intention

The impact of turnover intention on the relationship between working conditions and

actual turnover was tested. Overall model fit of all three models were satisfactory as indicated in Table 4.7. Likelihood ratio tests with chi-square statistics showed that the fully mediated model (Model 3) appeared to provide a better fit than Model 1. Due to the negative chi-square difference between Model 3 and Model 2, the chi-square difference test between these two models could not be conducted. The goodness-of-fit indices of the fully mediated model were  $\chi^2(70)=282.82$  ( $p<.01$ ),  $\chi^2/df=4.183$ , and RMSEA=.045.

Table 4.7 Fit Indices for the Mediating Model of Turnover Intention on the Effect of Working Conditions on Actual Turnover

Hypothesized Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model 1 (non-mediated)	327.85	70	<.01	4.684	.049
Model 2 (partially mediated)	294.28	69	<.01	4.265	.046
Model 3 (fully mediated)	292.82	70	<.01	4.183	.045
$\chi^2$ difference (Model1-Model2)	33.57	1	<.01		
$\chi^2$ difference (Model3-Model2)	-1.46	1			



$\chi^2(70)=292.82$  ( $p<.01$ ),  $\chi^2/df=4.183$ , and RMSEA=.045

\*  $p<.10$ , \*\* $p<.05$ , \*\*\* $p<.01$

Figure 4.12 Fully Mediated Model of Turnover Intention Mediating the Effect of Salary on Actual Turnover

In the fully mediated model shown in Figure 4.12, working conditions had a negative direct impact on turnover intention ( $\tilde{\beta} = -.40, t = -6.68$ ) and turnover intention had a positive direct impact on actual turnover ( $\tilde{\beta} = .33, t = 7.13$ ). The indirect effect of working conditions on actual turnover mediated by turnover intention was negative and significant ( $-.40 * .33 = -.132, t = -5.519$ ). Teachers who worked in schools with worse working conditions were more likely to intend to leave and actually quit teaching. The results supported part of Hypothesis 2c stating that working conditions had an indirect impact on actual intention mediated by turnover intention. In addition, the mediating effect of turnover intention on the association between professional training experiences and actual turnover was not examined because the direct effect of professional training experiences on actual turnover was not significant.

### **The Impact of Job Satisfaction on Actual Turnover Mediated by Turnover Intention**

Table 4.8 shows the mediating effect of turnover intention on the association between job satisfaction and actual turnover. As indicated in Table 4.10, overall fit indices of all three models were satisfactory, indicating that the fully mediated model (Model 3) appeared to provide a better fit than Models 1 and 2.

Table 4.8 Fit indices for the Mediating Model of Turnover Intention on the Effect of Job Satisfaction on Actual Turnover

<b>Hypothesized Model</b>	$\chi^2$	<i>df</i>	<i>p</i> value	$\chi^2/df$	<b>RMSEA</b>
Model 1 (non-mediated)	405.36	96	<.01	4.223	.045
Model 2 (partially mediated)	393.02	95	<.01	4.137	.045
Model 3 (fully mediated)	392.75	96	<.01	4.091	.044
$\chi^2$ difference (Model1-Model2)	12.34	1	<.01		
$\chi^2$ difference (Model3-Model2)	-0.27	1			

The chi-square difference between Model 1 and Model 2 was 12.34 with one degree of freedom ( $p < .01$ ), suggesting improvement of model fit by adding the path from turnover intention (mediator) to actual turnover (dependent variable). The chi-square difference test between Model 3 and Model 2 could not be conducted since the difference was negative. Fit

indices for Model 3 were better than those for Model 2. Overall, the chi-square difference test and model comparisons indicated that the fully mediated model (Model 3) appeared to provide a better fit than the alternative models.

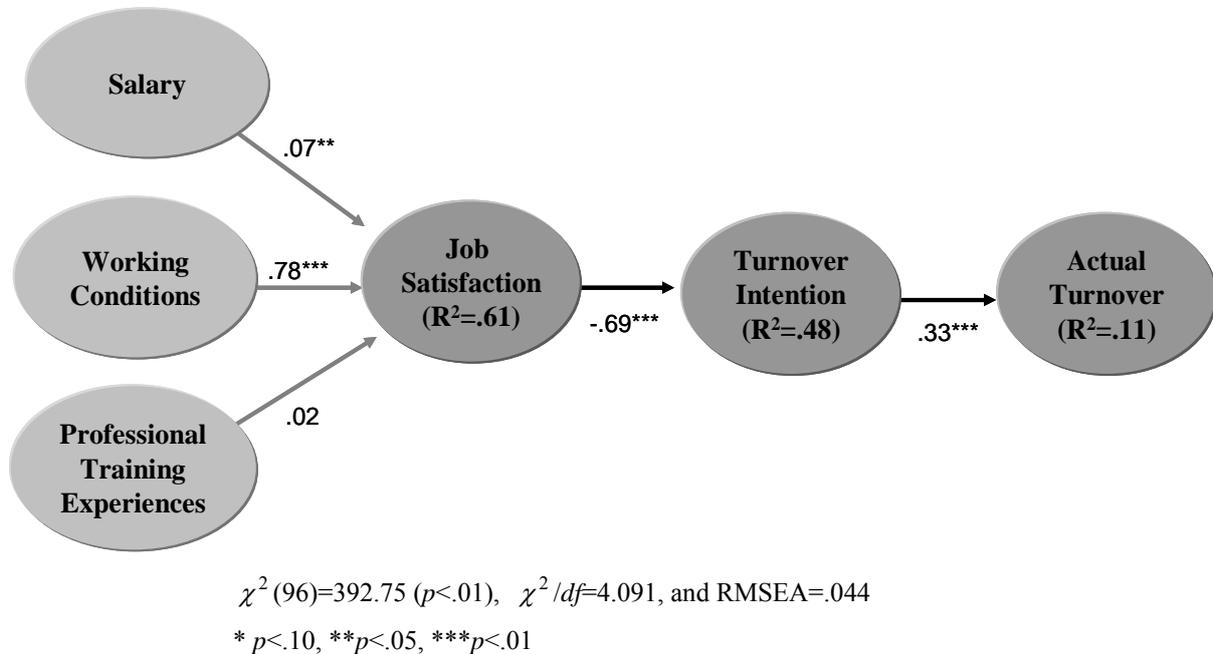


Figure 4.13 Fully Mediated Model of Turnover Intention Mediating the Effect of Job Satisfaction on Actual Turnover

Figure 4.13 presents the fully mediated model of turnover intention mediating the relationship between job satisfaction and actual turnover. All standardized path coefficients were significant except professional training experiences. Job satisfaction had a negative direct impact on turnover intention ( $\tilde{\beta} = -.69, t = -12.90$ ) and turnover intention had a positive direct impact on actual turnover ( $\tilde{\beta} = .33, t = 7.16$ ). Teachers who were more dissatisfied with their jobs were more likely to intend to leave teaching and more likely to quit teaching. The indirect effect of job satisfaction on actual turnover mediated by turnover intention was negative and significant ( $-.69 \times .33 = -.228, t = 7.16$ ). When teachers' perceptions about their job satisfaction increase by one standard deviation, teachers' decisions to leave decrease by .228 standard deviation. The results supported Hypothesis 2d that turnover intention would mediate the association between job satisfaction and actual turnover.

In sum, job satisfaction did not mediate the relationship between salary and turnover intention, but partially mediated the relationship between working conditions and turnover intention. Turnover intention did not mediate the association between salary and actual turnover, while turnover intention fully mediated the relationship between working conditions and actual turnover. In addition, turnover intention fully mediated the relationship between job satisfaction and actual turnover.

### **Multi-Group Analysis**

Multi-group SEM analyses (MGSEM) were performed to examine whether structural relationships in the final structural equation model differed across teacher and school characteristics. As a prerequisite to testing for differences in the strength of the structural relationships, it is customary to first establish a baseline model for each subgroup separately. As discussed in Chapter III, first, the equivalence of the measurement model was established, and second, the structural models were compared (Byrne, 1998; Joreskog & Sorbom, 1993; Kelloway, 1998).

Given that there was no difference between the unconstrained and constrained measurement models (i.e., invariant factor loadings), the structural paths of interest among the latent variables were compared by examining chi-square differences and other fit indices (e.g.,  $\chi^2/df$  and RMSEA) between the fully unconstrained model and the model with an unconstrained path of interest. In comparing this partially constrained model with the unconstrained one, the differences in chi-squares were examined to evaluate whether the fit of the constrained model is significantly worse than that of the unconstrained.<sup>30</sup> The

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<sup>30</sup> In general, multi-group analysis focuses on making cross-group comparisons of factor loadings, structural paths, and the elements of the variance/covariance matrix for exogenous variables. In contrast, variances/covariances for errors and disturbance terms are rarely of interest in such analyses. Variances/covariances for errors and disturbance terms are rarely of interest in MGSEM analyses, since it is not realistic to assume that error variances across groups are equal, the study can set each error variance free. In practice, it is common to define measurement invariance as invariance of the factor loadings.

subgroups for MGSEM analysis were drawn from teacher and school characteristics discussed in the section on descriptive results in the chapter III.

### The Final Structural Model

Based on the results of tests of the relative weights and mediating effects, the study established the final structural model for group comparisons. Figure 4.14 displays the final structural model.<sup>31</sup>

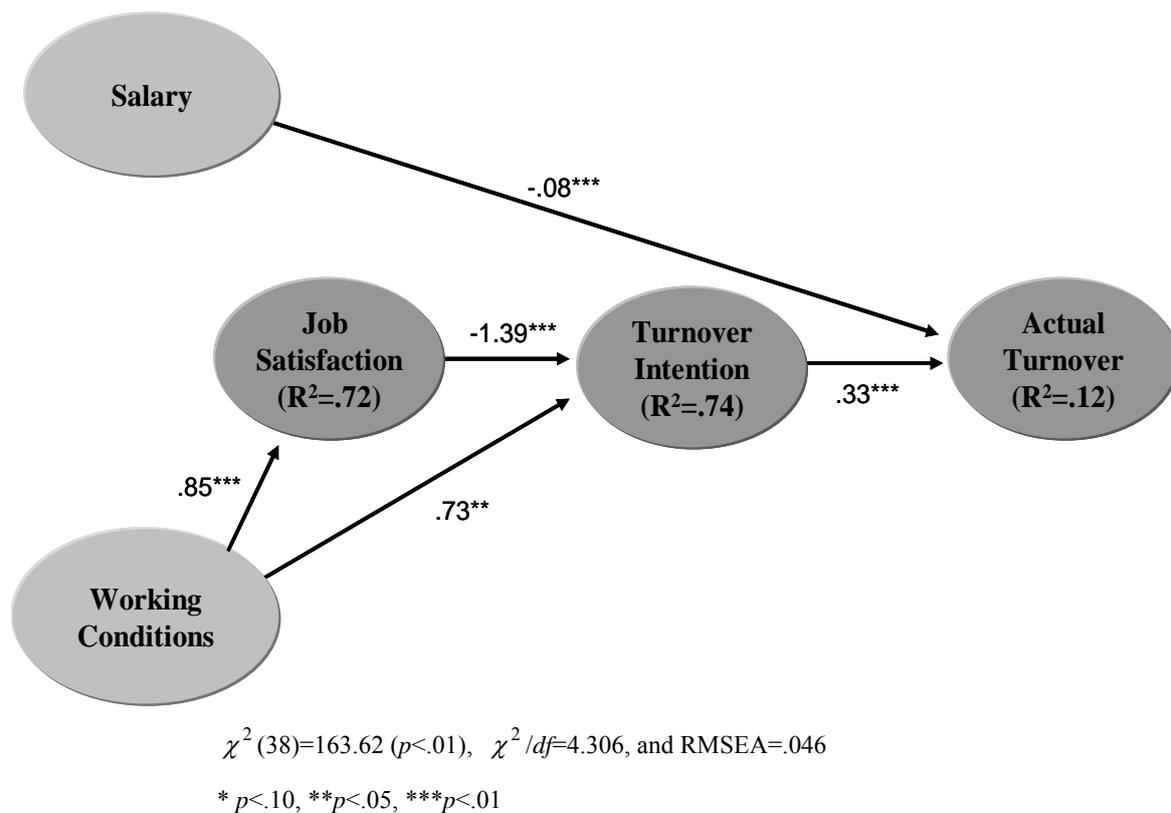


Figure 4.14 The Final Structural Model<sup>32</sup>

Overall model fit to the data was satisfactory, with  $\chi^2(38)=163.62 (p<.01)$ ,  $\chi^2/df=4.306$ , and  $RMSEA=.046$ . All standardized path coefficients were significant at the .05 level. Explained variances of actual turnover, turnover intention, and job satisfaction were

<sup>31</sup> The final structural model with indicators attached in the Appendix B.

<sup>32</sup> One of the exogenous variable, professional training experiences, was excluded in the final structural model since this variable did not have any significant relationship with other variables.

72%, 74%, and 12%, respectively. The relatively small proportion of variance explaining actual turnover might be partly driven by the reasons discussed earlier (i.e., a short interval between the measure of actual turnover and turnover intention and omission of other external factors).

The standardized direct, indirect, and total effects represented by the model are summarized in Table 4.9. All of these effects were statistically significant at the .05 level. The associated standard errors were relatively small, indicating a relatively high degree of precision in the population estimates.

Table 4.9 Standardized Direct, Indirect, and Total Effect for the Final Structural Model

Dependent Variable	Independent Variable	Direct Effect	<i>t</i> value	<i>se</i>	Indirect Effect	<i>t</i> value	<i>se</i>	Total Effect	<i>t</i> value	<i>se</i>
Job Satisfaction R <sup>2</sup> =.718	Working Conditions	.85	9.44	.026	-	-	-	.85	9.44	.026
	Job Satisfaction	-1.39	-4.09	.504	-	--	--	-1.39	-4.09	.504
Turnover Intention R <sup>2</sup> =.745	Working Conditions	.73	2.29	.139	-1.18	-3.55	.144	-.45	-6.78	.029
	Job Satisfaction	-1.39	-4.09	.504	-	--	--	-1.39	-4.09	.504
Actual Turnover R <sup>2</sup> =.115	Salary	-.08	-3.64	.004	--	--	--	-.08	-3.64	.004
	Working Conditions	--	--	--	-.15	-5.51	.003	-.15	-5.51	.003
	Job Satisfaction	--	--	--	-.46	-3.719	.052	-.46	-3.72	.052
	Turnover Intention	.33	7.09	.013	--	--	--	.39	7.09	.013

As indicated in Figure 4.14 and Table 4.9, salary had a negative direct effect on actual turnover ( $\tilde{\beta} = -.08$ ,  $t = -3.64$ ), but not on job satisfaction and turnover intention. Working conditions had a positive direct effect on job satisfaction ( $\tilde{\beta} = .85$ ,  $t = 9.44$ ). Contrary to expectations, working conditions had a positive impact on turnover intention ( $\tilde{\beta} = .73$ ,  $t = 2.29$ ). In addition, working conditions had a negative indirect effect on turnover intention mediated by job satisfaction ( $\tilde{\beta} = -1.18$ ,  $t = -3.55$ ). In addition, working conditions had a

negative indirect effect on actual turnover ( $\tilde{\beta} = -.15, t = -5.51$ ).<sup>33</sup> Job satisfaction had a negative direct effect on turnover intention ( $\tilde{\beta} = -1.39, t = -4.09$ ) and turnover intention had a positive direct impact on actual turnover ( $\tilde{\beta} = .33, t = 7.09$ ). Job satisfaction had a negative indirect effect on actual turnover mediated by turnover intention ( $\tilde{\beta} = -.46, t = -3.72$ ).

## Teacher Characteristics

### Gender

In general, some of the turnover literature has suggested that female teachers are more likely to leave their jobs than males (Gritz & Theobald, 1996; Stinebrickner, 2001; Weiss, 1999). In order to examine variations in the magnitude of effects by gender, the sample was divided into two groups: male teachers (weighted N= 184,681/unweighted N=502) and female teachers (weighted N= 52,849/unweighted N=1,061). Before testing whether the structural relationships were different between female and male teachers, the equivalence of the measurement model was tested.

As indicated in Table 4.10, the chi-square difference between the constrained and unconstrained models was 19.92 with 6 degrees of freedom<sup>34</sup> ( $p < .01$ ), indicating there was a difference between the unconstrained and constrained models. In other words, the unconstrained model fitted to the data more closely than the constrained model. The other model fit indices of the unconstrained model were better than those of the constrained model. These results indicated that factorial invariance did not exist. Next, I attempted to pinpoint the source, i.e., which factor loadings actually differed. To do that, modification indices were examined to assess which paths should be estimated separately for the different groups.

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<sup>33</sup> The indirect of working conditions on actual turnover is the sum of two indirect effects; 1) multiply the effect of working conditions on job satisfaction, the effect of job satisfaction on turnover intention, and the effect of turnover intention on actual turnover ( $.85 * -1.39 * .33 = -.39$ ), 2) multiply the effect of working conditions on turnover intention and turnover intention and actual turnover together ( $.73 * .33 = .24$ )

<sup>34</sup> The degree of freedom is the same with 6 factor loadings that was not estimated in the constrained model.

Table 4.10 Results of Test of Invariance of Measurement Model for Gender

Measurement Model	$\chi^2$	<i>df</i>	<i>p</i> value	$\chi^2/df$	RMSEA
Model A (unconstrained)	180.84	68	<.01	2.659	.046
Model B (constrained)	200.76	74	<.01	2.713	.047
$\chi^2$ difference (Model B-Model A)	19.92	6	<.01		
Model C (partially constrained)	200.69	73	<.01	2.749	.047
$\chi^2$ difference (Model C-Model A)	19.85	5	<.01		

Note: Weighted N for male teachers =52,849 (unweighted N=502) and weighted N for female teachers =18,481 (unweighted N=1,061)

Modification indices suggested that allowing the factor loading for T318 (“I sometimes feel it is a waste of time to try to do my best as a teacher”) on job satisfaction to vary would improve the fit of the constrained model. After free estimation of factor loading from T318 on job satisfaction, the partially constrained model was estimated again to compare that model to the fully unconstrained model using the chi-square difference statistic.

With this one constraint lifted, the chi-square was 206.69 with 73 degrees of freedom ( $p < .01$ ), the normed chi-square ( $\chi^2/df$ ) was 2.749, and RMSEA was .047 as shown in Table 4.10. The difference between this partially constrained model and unconstrained model was 19.85 with 5 degrees of freedom and an associated *p* value of less than .01, indicating that the partially constrained model and the unconstrained model differed significantly. Other indices pointed to the unconstrained model as having a better fit than the constrained and the partially constrained model. These findings indicated that there was no evidence of equivalence of factor loadings by teacher gender, suggesting that the association between the independent variables and dependent variables do not differ between male and female teachers.

### Race

Due to sample size constraints, the impact of teacher race/ethnicity of teachers on structural relationships was tested with two racial groups: white teachers (weighted N=

195,358/unweighted N=1,323) and others (weighted N=42,172/unweighted N=240). The study examined teachers' race/ethnicity because some studies have reported higher attrition rates among white teachers (Grissmer & Kirby, 1997; Ingersoll, 2001).

Results of tests of invariance of the measurement model indicated that factor loadings did not differ between white teachers and others. The chi-square difference between the unconstrained and constrained models was 8.31 and  $df=6$  (See Table 4.11). The associated  $p$  value was greater than .5, indicating no difference between the two models. Other fit indices for the constrained model showed a better fit than those of unconstrained model.

Table 4.11 Results of Test of Invariance of Measurement Model for Race

Measurement Model	$\chi^2$	$df$	$p$ value	$\chi^2/df$	RMSEA
Model A (unconstrained)	192.68	68	<.01	2.834	.048
Model B (constrained)	200.99	74	<.01	2.716	.048
$\chi^2_{difference}$ (Model B-Model A)	8.31	6	>.05		

Note: Weighted N for white teachers =195,358 (unweighted N=1,323) and weighted N for others =42,172 (unweighted N=240)

The difference in structural path coefficients indicated in Table 4.12 was similarly tested. The chi-square difference between the unconstrained structural and constrained structural models could not be tested due to a negative chi-square difference. As shown in Table 4.13, overall model fit indices indicated that the constrained structural model had a better fit, suggesting that unstandardized structural path coefficients do not differ by teachers' race/ethnicity.

Results of tests of invariance of the structural relationships by teacher race showed no significant difference in structural path coefficients between white teachers and others (See Table 4.13). The chi-square and other fit indices showed a better fit to the data than those of the unconstrained model that allows the estimation of path coefficients by groups. These findings suggested that teachers' race does not make any difference in associations between independent variables and dependent variables.

Table 4.12 Structural Path Coefficients between White and Other Racial Teachers

Paths	From	To	Unstandardized path coefficients	
			White Teachers	Others
Salary		Actual Turnover	-.02***	-.02
Working Conditions		Job Satisfaction	.28***	.21***
		Turnover Intention	.31	.04
Job Satisfaction		Turnover Intention	-1.87***	-.91**
Turnover Intention		Actual Turnover	.10***	.03

Notes: 1. Weighted N for white teachers =195,358 (unweighted N=1,323) and weighted N for others =42,172 (unweighted N=240)

2. \* p<.10, \*\*p<.05, \*\*\*p<.01

Table 4.13 Results of Test of Invariance of Structural Model for Race

Structural Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	216.16	76	<.01	2.844	.049
Model B (constrained)	209.68	81	<.01	2.589	.045
$\chi^2_{difference}$ (Model B-Model A)	-6.48	5			

Note: Weighted N for white teachers =195,358 (unweighted N=1,323) and weighted N for others =42,172 (unweighted N=240)

## Degree

Previous studies on the relationship between teachers' degree and teacher turnover have showed mixed findings (Kirby, Berends, & Naftel, 1999; Shin, 1995; Theobald, 1990). The possible impacts of earned degrees on the structural relationships were tested with a group of teachers with a bachelor's degree (weighted N=147,348/ unweighted N=967) and with a master's degree (weighted N=88,856/unweighted N=569). Teachers without any degree (.2%) and with a doctoral degree (.4%) were excluded due to small samples.

Table 4.14 Results of Test of Invariance of Measurement Model for Degree

Measurement Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	185.86	68	<.01	2.733	.048
Model B (constrained)	190.47	74	<.01	2.574	.045
$\chi^2_{difference}$ (Model B-Model A)	4.61	6	>.05		

Note: Weighted N for teachers with a bachelor's degree =147,348/ (unweighted N=967) and weighted N for teachers with a master's degree =88,856 (unweighted N=569)

As indicated in Table 4.14, tests of invariant factor loadings between teachers with a bachelor's degree (B.A.) and with a master's degree (M.A.) showed factor loadings that appear to be equal between the two groups. Overall, other fit indices of the constrained measurement model showed a better fit.

Table 4.15 Structural Path Coefficients between Teachers with a B.A and a M.A

Paths From	To	Unstandardized path coefficients	
		Teachers with B. A	Teachers with M. A
Salary	Actual Turnover	-.02***	-.01
Working Conditions	Job Satisfaction	.24***	.29***
	Turnover Intention	-.30	-.26
Job Satisfaction	Turnover Intention	.42**	.21
Turnover Intention	Actual Turnover	.07***	.10**

Notes: 1. Weighted N for teachers with a bachelor's degree =147,348/ (unweighted N=967) and weighted N for teachers with a master's degree =88,856 (unweighted N=569)

2. \* p<.10, \*\*p<.05, \*\*\*p<.01

Table 4.16 Results of the Test of Invariance of Structural Model for Degree

Structural Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	202.76	76	<.01	2.668	.047
Model B (constrained)	197.47	81	<.01	2.438	.043
$\chi^2_{difference}$ (Model B-Model A)	-5.29	5			

Note: Weighted N for teachers with B.A =147,348 (unweighted N=967) and weighted N for teachers with M.A =88,856 (unweighted N=569)

The structural relationships (See Table 4.15) did not appear to be different between teachers with B.A.s and those with M.A.s. Table 4.16 shows the test result of structural relationships between two groups specified by earned degree. The chi-square difference test could not be conducted and other fit indices of the constrained structural model were better, suggesting that the two models do not differ (See Table 4.16). These findings indicated that teachers' education level (i.e., earned degree) did not make any significant difference in associations between independent variables and dependent variables.

### Certification

The type of certification held has been considered in some studies (Boe et al., 1997;

Henke et al., 2000; Shin, 1995). Findings have suggested that teachers with advanced certificates are more likely to switch schools or leave teaching. Whether certificate types influence the factor loadings and/or structural path coefficients was tested with a group of teachers with regular and/or advanced certificate (weighted N=191,898/unweighted N=1,267) and their counterparts, i.e., teachers without certificates and/or without regular certificates (weighted N=45,632/unweighted N=296).

The results of test of equality of factor loadings in measurement models suggested that there is no difference by teacher groups classified by certificate types (See Table 4.17). The chi-squares and other fit indices of the two models appeared to be slightly different. The chi-square difference test resulted in a failure to reject the null hypothesis.

Table 4.17 Results of Test of Invariance of Measurement Model for Certification

Measurement Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	181.04	68	<.01	2.662	.046
Model B (constrained)	183.97	74	<.01	2.486	.044
$\chi^2$ difference (Model B-Model A)	2.93	6	>.5		

Note: Weighted N for teachers with regular and/or advanced certificate =191,898 (unweighted N=1,267) and weighted N for teachers without certificates and/or regular certificates =45,632 (unweighted N=296)

Table 4.18 Structural Path Coefficients between Teachers with Regular and/or Advanced Certificate and Teachers without Certificates and/or Regular Certificate

Paths		Unstandardized path coefficients	
From	To	Teachers with Regular and/or Advanced Certificate	Teachers without Certificates and/or Regular Certificate
Salary	Actual Turnover	-.01***	-.05**
Working Conditions	Job Satisfaction	.26***	.22***
	Turnover Intention	-.60	.14
Job Satisfaction	Turnover Intention	1.54***	-1.41
Turnover Intention	Actual Turnover	.07***	.16

Notes: 1. Weighted N for teachers with regular and/or advanced certificate =191,898 (unweighted N=1,267) and weighted N for teachers without certificates and/or regular certificates =45,632 (unweighted N=296)

2. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Whether the structural path coefficients differ between teachers with regular or advanced certificates and those without certificates or regular certificates (See Table 4.18) were tested. The results showed that no evidence of differences in the structural relationship between the two groups (See Table 4.19). This finding suggested that teacher certificate type does not affect associations among salary, working conditions, job satisfaction, and turnover intention, and actual turnover.

Table 4.19 Results of Test of Invariance of Structural Model for Certification

Structural Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	207.31	76	<.01	2.728	.047
Model B (constrained)	186.98	81	<.01	2.308	.041
$\chi^2_{difference}$ (Model B-Model A)	-20.33	5			

Note: Weighted N for teachers with regular and/or advanced certificate =191,898 (unweighted N=1,267) and weighted N for teachers without certificates and/or regular certificates =45,632 (unweighted N=296)

### Years of Teaching Experience

Table 4.18 indicates an equivalence of measurement models for teachers who have taught 3 years or less (weighted N=75,156/unweighted N=490) and teachers who have taught more than 3 years (weighted N=162,374/unweighted N=1,073). Previous studies have reported the highest percentage of teachers left schools within three years (Ingersoll, 2001; NCTAF, 2003).

As indicated in Table 4.20, a chi-square difference test showed that the unconstrained and constrained measurement models were not different. Model fit indices of the constrained model had a better fit than those of the unconstrained model. Table 4.21 shows how the structural path coefficients differ, given equal factor loadings in the models between less experienced and more experienced teachers. As indicated in Table 4.22, structural path coefficients were not different between the two groups of teachers. The chi-square statistic in the constrained structural model was smaller than the unconstrained model, and other fit

indices were better than those in unconstrained model. This result suggested that years of teaching experience do not have a significant influence on teachers' turnover decision process model.

Table 4.20 Results of Test of Invariance of Measurement Model for Years of Teaching Experience

Measurement Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	162.02	68	<.01	2.383	.042
Model B (constrained)	162.50	74	<.01	2.196	.039
$\chi^2_{difference}$ (Model B-Model A)	.48	6	>.05		

Note: Weighted N for teachers who have taught more than 3 years =162,347 (unweighted N=1,073) and weighted N=75,156 for teachers who have taught 3 years or less (unweighted N=490)

Table 4.21 Structural Path Coefficients between Teachers with Less than 3 Years of Teaching Experience and More than 3 Years of Teaching Experience

Paths	From	To	Unstandardized path coefficients	
			Teachers with less than 3 years of teaching experience	Teachers with more than 3 years of teaching experience
Salary		Actual Turnover	-.03*	-.01***
Working Conditions		Job Satisfaction	.24***	.27***
		Turnover Intention	.38	.04
Job Satisfaction		Turnover Intention	-2.18	-.93***
Turnover Intention		Actual Turnover	.17**	.06**

Notes: 1. Weighted N for teachers who have taught more than 3 years =162,347 (unweighted N=1,073) and weighted N=75,156 for teachers who have taught 3 years or less (unweighted N=490)

2. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 4.22 Results of Test of Invariance of Structural Model for Years of Teaching Experiences

Structural Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	165.56	76	<.01	2.178	.039
Model B (constrained)	160.16	81	<.01	1.977	.035
$\chi^2_{difference}$ (Model B-Model A)	-5.4	5			

Note: Weighted N for teachers who have taught more than 3 years =162,347 (unweighted N=1,073) and weighted N=75,156 for teachers who have taught 3 years or less (unweighted N=490)

In addition, the study examined whether structural relationships vary by teachers with more or less than the average years of experience in the sample (i.e., 11.71 years). Again, there was no significant difference in structural path coefficients between teachers with more and less than 11.71 years of teaching experience.

### **Age**

Some studies have found that younger teachers and older teachers leave at much higher rates of turnover than middle-aged teachers (Grissmer & Kirby, 1997; Ingersoll, 2001; Kirby et al., 1999). The effect of average age of teachers (39.22 years old) on difference in structural relationships was tested with two groups: Teachers who were over the average age (weighted N=116,046/unweighed N=779) and teachers who were under average age (weighted N=121,484/unweighed N=784).

As indicated in Table 4.23, the chi-square difference test showed that factor loadings in measurement models were not same between teachers over and under the average age. Next, modification indices were examined to assess which paths should be estimated separately for the different groups. Modification indices indicated that the difference between the unconstrained and constrained model was drawn by the difference in the factor loading from T339 (“If you could go back to your college days and start over again, would you become a teacher or not?”) to turnover intention. This suggested that allowing the estimation of the factor loading (i.e., unconstraint of the path from T339 to turnover intention) would improve the fit of the constrained model.

The difference between the partially constrained model and unconstrained model was 4.15 with 5 degrees of freedom and the associated *p* value of .528, indicating that the partially constrained model based on the modification index and the unconstrained model did not differ. These findings indicated the equivalence of factor loadings by average age of teachers. The significance of the variations in structural relationships (See Table 4.24) was tested. The

result showed no difference in these structural relationships as indicated in Table 4.25. These findings suggested that structural relationships do not differ by the average of teachers.

Table 4.23 Results of Test of Invariance of Measurement Model for Age

Measurement Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	173.55	68	<.01	2.552	.045
Model B (constrained)	191.69	74	<.01	2.590	.045
$\chi^2$ difference (Model B-Model A)	18.14	6	<.01		
Model C (partially constrained)	177.7	73	<.01	2.434	.043
$\chi^2$ difference (Model C-Model A)	4.15	5	>.05		

Note: Weighted N for teachers over the average age =116,046 (unweighted N=779) and weighted N for teachers under the average age =121,484 (unweighted N=784)

Table 4.24 Structural Path Coefficients between White and Other Racial Teachers

Paths		Unstandardized path coefficients	
From	To	Teachers over Average Age	Teachers under Average Age
Salary	Actual Turnover	-.01**	-.02***
Working Conditions	Job Satisfaction	.28**	.24***
	Turnover Intention	.16	.35
Job Satisfaction	Turnover Intention	-1.36***	-2.17
Turnover Intention	Actual Turnover	.05**	.13***

Notes: 1. Weighted N for teachers over the average age =116,046 (unweighted N=779) and weighted N for teachers under the average age =121,484 (unweighted N=784)

2. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 4.25 Results of Test of Invariance of Structural Model for Age

Structural Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	200.38	76	<.01	2.637	.046
Model B (constrained)	191.24	81	<.01	2.361	.042
$\chi^2$ difference (Model B-Model A)	-9.14	5			

Note: Weighted N for teachers over the average age =116,046 (unweighted N=779) and weighted N for teachers under the average age =121,484 (unweighted N=784)

## Subject Areas

The impact of subject area taught on teacher turnover decisions has been studied.

Findings indicated that science and math teachers were more likely to leave teaching than

their counterparts who teach other subjects (Ingersoll, 1999; Murnane, Singer, Willett, Kemple & Olsen, 1991; Weiss, 1999). This study divided teachers into two groups based on subject areas they taught: Math and science teachers (weighted N=25,022/unweighted N=240) and others (weighted N=212,508/unweighted N=1,323).

The test of the invariance of factor loadings between two models indicated no difference in measurement models, showing a better model fit for the constrained model (See Table 4.26). Given the invariant factor loadings, differences in the structural relationships (See Table 4.27) were tested with chi-square difference and other model fit indices. As indicated in Table 4.28, the structural relationships between the math/science group and the other group were not different, showing a better model fit for the constrained model. Thus, we could conclude that there was no difference in structural relationships by subject areas of teachers.

Table 4.26 Results of Test of Invariance of Measurement Model for Subject Areas (Math/Science and Others)

Measurement Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	214.62	68	<.01	3.156	.053
Model B (constrained)	221.6	74	<.01	2.995	.051
$\chi^2_{difference}$ (Model B-Model A)	6.98	6	>.05		

Note: Weighted N for math/science teachers =25,022 (unweighted N=240) and weighted N for others=212,508 (unweighted N=1,323)

Table 4.27 Structural Path Coefficients between Math/Science Teachers and Others

Paths	From	To	Unstandardized path coefficients	
			Math/Science Teachers	Others
Salary		Actual Turnover	-.01	-.01***
Working Conditions		Job Satisfaction	.27***	.24***
		Turnover Intention	.13***	-.50
Job Satisfaction		Turnover Intention	-1.61	1.35
Turnover Intention		Actual Turnover	.16***	.07***

Notes: 1. Weighted N for math/science teachers =25,022 (unweighted N=240) and weighted N for others=212,508 (unweighted N=1,323)

2. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 4.28 Results of Test of Invariance of Structural Model for Subject Areas (Math/Science and Others)

Structural Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	234.94	76	<.01	3.091	.052
Model B (constrained)	229.98	81	<.01	2.839	.049
$\chi^2$ difference (Model B-Model A)	-4.96	5			

Note: Weighted N for math/science teachers =25,022 (unweighted N=240) and weighted N for others=212,508 (unweighted N=1,323)

Additionally, the study examined variations in the structural path coefficients between special education teachers (weighted N=21,739/unweighted N=160) and others (weighted N=215,791/unweighted N=1,403). High rates of turnover among special education teachers are often reported in the literature (Boe, et. al., 1997).

Table 4.29 Results of Test of Invariance of Measurement Model for Subject Areas (Special Ed and Others)

Measurement Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	177.38	68	<.01	2.609	.045
Model B (constrained)	174.87	74	<.01	2.363	.042
$\chi^2$ difference (Model B-Model A)	-2.51	6			
Model C (partially constrained)	177.70	73	<.01	2.434	.043
$\chi^2$ difference (Model C-Model A)	.32	5	>.05		

Note: Weighted N for special ed teachers =21,739 (unweighted N=160) and weighted N for others=215,791 (unweighted N=1,403)

Table 4.30 Structural Path Coefficients between Math/Science Teachers and Others

Paths	From	To	Unstandardized path coefficients	
			Special Ed Teachers	Others
Salary		Actual Turnover	-.03*	-.01***
Working Conditions		Job Satisfaction	.24***	.25***
		Turnover Intention	.29***	-.20***
Job Satisfaction		Turnover Intention	-2.21	.00
Turnover Intention		Actual Turnover	-.08	.10***

Notes: 1. Weighted N for special ed teachers =21,739 (unweighted N=160) and weighted N for others=215,791 (unweighted N=1,403)

2. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 4.31 Results of the Test of Invariance of Structural Model for Subject Areas (Special Ed and Others)

<b>Structural Model</b>	$\chi^2$	<i>df</i>	<i>p</i> value	$\chi^2/df$	<b>RMSEA</b>
Model A (unconstrained)	185.54	76	<.01	2.441	.043
Model B (constrained)	178.52	81	<.01	2.204	.039
$\chi^2$ difference (Model B-Model A)	-7.02	5			
Model C (partially constrained)	177.7	73	<.01	2.434	.043
$\chi^2$ difference (Model C-Model A)	-7.84	-3			

Note: Weighted N for special ed teachers =21,739 (unweighted N=160) and weighted N for others=215,791 (unweighted N=1,403)

The results indicated no difference in the structural relationships between special education and others as indicated in Table 4.29 4.30, and 4.31. As indicated in Table 4.31, the structural relationships between the special education group and the other group were not different, showing a better model fit for the constrained model. Thus, we could conclude that associations among variables were not different between special education teachers and other subject areas of teachers.

## **School Characteristics**

### **School Level**

Relationships between school level (elementary, middle or high school) and teacher turnover were examined (Murnane et al., 1991; Shin, 1995; Weiss, 1999). Findings indicated that teachers at middle and high schools were more likely to leave teaching, though those studies did not provide any clear causal explanation. In order to examine whether structural relationships vary by school level, this study used the measure of teaching level to create two groups: Elementary school teachers (weighted N=155,612/unweighted N=739) and secondary school teachers (weighted N=81,918/unweighted N=824).

The equality of factor loadings was tested between the unconstrained and constrained models. As indicated in Table 4.32, factor loadings differed between the two models. A chi-square difference test between the unconstrained and constrained measurement models was

significant, and other indices pointed to the unconstrained model as having a better fit.

Modification indices suggested that allowing the factor loadings for family/parent support (WC\_PS) on working conditions (WC) to vary would improve the fit of the constrained model. Perhaps the level of family/parent support is differently perceived by teachers in elementary and secondary schools. After freeing WC\_PS from equality constraints, chi-square and fit indices of the partially constrained model appear to be better than those for the constrained model. As indicated in Table 4.30, the result of the chi-square difference test between the partially constrained and unconstrained measurement models indicated that the two models differed ( $\chi^2_{difference}=28.74$ ,  $df=5$ ,  $P<.01$ ). Given invariant factor loading from WC to WC\_PS, structural path coefficients were examined whether they are significantly differ by school level group. As indicated in Table 4.33, structural relationships by school level did not differ. This finding suggested that school level teachers taught did not make any difference in associations among the variables used in the study.

Table 4.32 Results of Test of Invariance of Measurement Model for School Level

Measurement Model	$\chi^2$	<i>df</i>	<i>p</i> value	$\chi^2/df$	RMSEA
Model A (unconstrained)	187.36	68	<.01	2.755	.047
Model B (constrained)	222.98	74	<.01	3.013	.052
$\chi^2_{difference}$ (Model B-Model A)	35.62	6	<.01		
Model C (partially constrained)	216.1	73	<.01	2.960	.050
$\chi^2_{difference}$ (Model C-Model A)	28.74	5	<.01		

Note: Weighted N for elementary school teachers=155,612 (unweighted N=739) and weighted N for others=81,918 (unweighted N=824)

Table 4.33 Results of Test of Invariance of Structural Model for School Level

Structural Model	$\chi^2$	<i>df</i>	<i>p</i> value	$\chi^2/df$	RMSEA
Model A (unconstrained)	228.40	75	<.01	3.045	.051
Model B (constrained)	225.05	80	<.01	2.813	.048
$\chi^2_{difference}$ (Model B-Model A)	-3.35	5			

Note: Weighted N for elementary school teachers=155,612 (unweighted N=739) and weighted N for others=81,918 (unweighted N=824)

## Student-Teacher Ratio

Student-teacher ratio has often been explored in relation to teacher salary and teacher supply but less so in the turnover literature. In one notable study, authors found a positive relationship between teacher turnover and student-teacher ratio (Kirby, Berends, & Naftel, 1999). This study used the school-level average student-teacher ratio (Mean=16.01) to examine the impact of a student-teacher ratio on the structural relationships among the constructs of interest. Teachers who taught in schools with below average ratios were low ratio teachers (weighted N=120,471/unweighted N=831; those who taught in schools with above average student-teacher ratios were high ratio teachers (weighted N=94,873/unweighted N=610).<sup>35</sup>

As shown in Table 4.34, factor loadings between the two models were not different, allowing further investigation on variations in the structural relationships indicated in Table 4.35. With the established equivalence of measurement model, structural relationships were examined for differences across the low and high ratio two groups specified by a ratio of student to teacher.

Table 4.34 Results of Test of Invariance of Measurement Model for Student-to-Teacher Ratio

Measurement Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	196.40	68	<.01	2.888	.051
Model B (constrained)	201.48	74	<.01	2.723	.049
$\chi^2_{difference}$ (Model B-Model A)	5.08	6	>.05		

Note: Weighted N for teachers who taught in schools with below average student-to-teacher ratio=120,471 (unweighted N=831) and weighted N for teachers who taught in schools with below average student-to-teacher ratio =94,873 (unweighted N=610)

As indicated in Table 4.36, model fit indices of the unconstrained appeared to be better than those of the constrained model though the chi-square difference test was unable

<sup>35</sup> There were 122 observations with missing values for student-teacher ratio, and these were excluded. Multi-group analyses, hereafter, excluded any observations with missing values.

due to the negative difference. These indicated that we did not have enough evidence to say that the structural relationships differ by level of student-to-teacher ratio.

Table 4.35 Structural Path Coefficients between Low Ratio of Student to Teacher and High Ration of Student to Teacher

Paths	From	To	Unstandardized path coefficients	
			Low Ratio of Student to Teacher	High Ratio of Student to Teacher
Salary		Actual Turnover	-.02***	-.01
Working Conditions		Job Satisfaction	.24***	.24***
		Turnover Intention	-.79	.65***
Job Satisfaction		Turnover Intention	2.51	-3.43
Turnover Intention		Actual Turnover	.07***	.10*

Notes: 1. Weighted N for teachers who taught in schools with below average student-to-teacher ratio=120,471 (unweighted N=831) and weighted N for teachers who taught in schools with below average student-to-teacher ratio =94,873 (unweighted N=610)

2. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 4.36 Results of Test of Invariance of Structural Model for Student-to-Teacher Ratio

Structural Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	214.23	76	<.01	2.819	.050
Model B (constrained)	206.26	81	<.01	2.546	.046
$\chi^2$ difference (Model B-Model A)	-7.97	5			

Note: Weighted N for teachers who taught in schools with below average student-to-teacher ratio=120,471 (unweighted N=831) and weighted N for teachers who taught in schools with below average student-to-teacher ratio =94,873 (unweighted N=610)

### Percent of Minority Students

Some studies on teacher turnover use percentage of minority students as a school demographic variable or a component of working conditions, along with a measure of student performance.<sup>36</sup> These studies consistently find that schools with higher proportions of minority students and low-performing students tend to have higher attrition rates (Hanushek, Kain, & Rivkin, 1999; Lankford, Loeb, & Wyckoff, 2002; Shen, 1997). To examine the impact of percent minority students on the structural relationships, this study created two

<sup>36</sup> Current SASS dataset did not include any information related to school/student performance.

groups based on the average percentage of minority students in the sampled schools (Mean=32.91): Low percent of minority students (weighted N=130,259/unweighted N=958) and high percent of minority students (weighted N=106,652/unweighted N=598).

First, the results of tests for invariance of the measurement model indicated that the factor loadings did not differ. The chi-square difference test was not significant at the .05 level;  $\chi^2_{\text{difference}} = 12.44$  ( $df=6$ ) and the associated  $p$  value of .053. Table 4.38 shows the structural path coefficients of each of the two groups. Statistical significance of the differences in path coefficients was tested.

Table 4.37 Results of Test of Invariance of Measurement Model for Percent of Minority Students

Measurement Model	$\chi^2$	$df$	$p$ value	$\chi^2/df$	RMSEA
Model A (unconstrained)	213.42	68	<.01	3.139	.052
Model B (constrained)	225.86	74	<.01	3.052	.051
$\chi^2_{\text{difference}}$ (Model B-Model A)	12.44	6	>.05		

Note: Weighted N for teachers who taught in schools with low percent of minority students=130,259 (unweighted N=958) and weighted N for teachers who taught in schools with high percent of minority students =106,652 (unweighted N=598)

Table 4.38 Structural Path Coefficients between Low Percent of Minority Students and High Percent of Minority Students

Paths	From	To	Unstandardized path coefficients	
			Low Percent of Minority Students	High Percent of Minority Students
	Salary	Actual Turnover	-.01**	-.03***
	Working Conditions	Job Satisfaction	.20***	.25***
		Turnover Intention	-.22	.39
	Job Satisfaction	Turnover Intention	.34*	-2.36***
	Turnover Intention	Actual Turnover	.12***	.07

Notes: 1. Weighted N for teachers who taught in schools with low percent of minority students=130,259 (unweighted N=958) and weighted N for teachers who taught in schools with high percent of minority students =106,652 (unweighted N=598)

2. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

As indicated in Table 4.39, the impact of the percentage of minority students did not have a significant impact on the structural path coefficients among variables. The chi-square

difference statistic could not be performed due to the negative value. Other model fit indices were better in the constrained model. This result suggested that percentage of minority students in schools where teachers taught does not make any difference in associations among the variables of the study.

Table 4.39 Results of Test of Invariance of Structural Model for Percent of Minority Students

<b>Structural Model</b>	$\chi^2$	<i>df</i>	<i>p</i> value	$\chi^2/df$	<b>RMSEA</b>
Model A (unconstrained)	237.40	76	<.01	3.124	.052
Model B (constrained)	232.37	81	<.01	2.869	.049
$\chi^2_{difference}$ (Model B-Model A)	-5.03	5			

Note: Weighted N for teachers who taught in schools with low percent of minority students=130,259 (unweighted N=958) and weighted N for teachers who taught in schools with high percent of minority students =106,652 (unweighted N=598)

### **Urbanicity of School**

School location has often been explored in turnover literature along with indicators of student poverty (Ingersoll, 2001; Smith & Ingersoll, 2004). In general, findings show that the highest teacher attrition rates occur in urban schools in high poverty areas (Smith & Ingersoll, 2004). The study used the SASS measures of urbanicity to create two groups: Teachers who worked in urban schools (weighted N=193,427/unweighted N=1,115) and teachers in rural schools (weighted N=44,103/unweighted=448).

The measurement models between the groups were equivalent, as indicated in Table 4.40. The chi-square difference test was not significant;  $\chi^2_{difference}= 1.77$  and the associate *p* value of .940. Sequentially, whether the structural models between groups differ was tested. Table 4.41 shows the structural path coefficients of each of the two groups. These structural relationships were tested. As indicated in Table 4.42, model fit indices of the constrained model were better than those of the unconstrained model. This indicated that there was no difference in the structural relationships between the two groups.

Table 4.40 Results of Test of Invariance of Measurement Model for Urbanicity

Measurement Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	199.34	68	<.01	2.931	0.05
Model B (constrained)	201.11	74	<.01	2.718	0.047
$\chi^2_{difference}$ (Model B-Model A)	1.77	6	>.05		

Note: Weighted N for teachers who worked in urban=193,427 (unweighted N=1,115) and weighted N for teachers who worked in rural schools =44,103 (unweighted N=448)

Table 4.41 Structural Path Coefficients between Urban Schools and Rural Schools

Paths	From	To	Unstandardized path coefficients	
			Teachers at Rural Schools	Teachers at Urban Schools
Salary		Actual Turnover	-.00	-.02***
Working Conditions		Job Satisfaction	.27***	.26***
		Turnover Intention	-.34	-.67
Job Satisfaction		Turnover Intention	.42	1.85***
Turnover Intention		Actual Turnover	.10***	.08***

Notes: 1. Weighted N for teachers who worked in urban=193,427 (unweighted N=1,115) and weighted N for teachers who worked in rural schools =44,103 (unweighted N=448)

2. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 4.42 Results of Test of Invariance of Structural Model for Urbanicity

Structural Model	$\chi^2$	df	p value	$\chi^2/df$	RMSEA
Model A (unconstrained)	214.98	76	<.01	2.829	.048
Model B (constrained)	203.71	81	<.01	2.515	.044
$\chi^2_{difference}$ (Model B-Model A)	-11.27	5			

Note: Weighted N for teachers who worked in urban=193,427 (unweighted N=1,115) and weighted N for teachers who worked in rural schools =44,103 (unweighted N=448)

In sum, the study did not find any statistically significant differences in the structural relationships by the teacher and school characteristics, though differences in structural path coefficients among variables existed by all of the characteristics except for gender. This result suggests that the final structural model displayed in Figure 4.13 can be hold for all teachers regardless of their individual characteristics and schools where they worked.

## **CHAPTER V**

### **DISCUSSION**

Teacher turnover is one of the most critical issues facing the public education system in the United States. It directly influences the teacher supply and the distributional equity of educational quality. Research has shown that nearly half of the American teaching force leaves the profession within five years (National Commission on Teaching and America's Future, 2003). To attract and retain qualified teachers, a growing number of states and districts are increasing financial incentives (Hirsch, Koppich, & Knapp, 2001), improving working conditions (Hirsh, 2005), and/or implementing professional development programs (Jacob & Lefgren, 2004). Forecasting which of these initiatives is most likely to reduce teacher attrition requires a better understanding of the relative importance of low salary, poor working conditions, and inadequate professional support on teachers' decisions to leave the profession.

To better understand the factors related to teachers' turnover decisions, this study has aimed to identify the relative weights of salary, working conditions, and professional training experiences on teachers' job satisfaction, turnover intention, and actual turnover, parsing out direct effects (e.g., the effect of salary on job satisfaction) and mediating effects (e.g., the effect of working conditions on turnover intention mediated by job satisfaction). Furthermore, it has examined whether these effects vary by individual teacher and school characteristics.

Previous literature has found that higher salary is associated with lower teacher attrition, though its effect is small and varies within subpopulations by age, gender, and education level (e.g., Brewer, 1996; Harris & Adams, 2004; Stinebrickner, 1998). Findings from studies about the effects of working conditions have been consistent, showing that teachers who work at schools better working conditions (e.g., administrative support, teacher autonomy, student behavior, school safety, and parent involvement) are more likely to be

satisfied with their jobs (Perie & Baker, 1997) and are less likely to leave the teaching profession (e.g., Ingersoll, 2001; Loeb, Darling-Hammond, & Luczak, 2005; Weiss, 1999). Few studies have probed the relationship between the amount and teachers' perceived usefulness of professional training experiences and turnover (See Smith & Rowley, 2005 for an exception).

This study found some relationships among educational variables that have been overlooked or misinterpreted in earlier studies as well as several effects that corresponded to the extant literature. Like previous research, the study found salary and working conditions to be significant variables that led to teachers' decisions to leave the profession. Furthermore, the study found that working conditions had more of an impact on teachers' job satisfaction, intention to leave, and actual turnover than either teachers' salary or professional training experiences. However, three independent variables explained a small proportion of variance of actual turnover. In addition, job satisfaction fully mediated the association between working conditions and actual turnover. Turnover intention fully mediated the relationship between working conditions and actual turnover. Finally, the structural relationships in the final model did not vary by any of the selected teacher and school characteristics.

### **Summary of Findings**

#### **The Impact of Working Conditions**

Like recent studies, this study found working conditions to be an important influence on a teacher's decision to leave the profession (Loeb et al., 2003; Ingersoll, 2001; Loeb, Darling-Hammond, & Luczak, 2003; Mont & Rees, 1996; Theobald & Gritz, 1996; Theobald, 1990; Sclan, 1993). In addition, working conditions was more influential on teachers' job satisfaction, intention to leave, and actual turnover than was teachers' salaries.

#### **Job Satisfaction and Turnover Intention**

In the test of relative weight, working conditions predicted job satisfaction in a

positive direction ( $\tilde{\beta}=.84$ ), like previous studies (Perie & Baker, 1997). The magnitude of the effect was about nine times as large as that for salary ( $\tilde{\beta}=.09$ ). Teachers were significantly more likely to be satisfied when they felt that they had high levels of support from administrators and parents, decision-making influence over school policy, and fewer problematic student behaviors. Only working conditions had a negative and direct impact on turnover intention ( $\tilde{\beta} = -.41$ ) in the relative weight model, indicating that when teachers' perceptions about their working conditions are low, they report a higher intention to leave teaching.

### **Actual Turnover**

Working conditions, among independent variables, had a negative impact on actual turnover in the model examining the relative weights of each factor ( $\tilde{\beta} = -.16$ ), confirming findings from previous studies (Loeb et al., 2003; Ingersoll, 2001; Loeb, Darling-Hammond, & Luczak, 2003). The impact of working conditions on actual turnover was about two times as large as that for salary ( $\tilde{\beta} = -.08$ ). When teachers' perceptions about their working conditions are low, they are more likely to actually leave teaching.

In the model examining the mediating effect of job satisfaction, the impact of working conditions on actual turnover was fully mediated by job satisfaction with an negative and indirect effect ( $\tilde{\beta} = -.197$ ). This means that teachers who work in schools with better working conditions are more likely to be satisfied with their jobs and are less likely to leave teaching. Through the mediation of job satisfaction, the impact of working conditions on actual turnover increases by .037 standard deviation from the relative weight model ( $\tilde{\beta} = -.16$ ).

In addition, turnover intention fully mediated the relationship between working conditions and actual turnover with a negative and indirect effect of working conditions on actual turnover ( $\tilde{\beta} = -.132$ ). This implies that teachers who work in schools with worse working conditions are more likely to report an intention to leave and more likely to leave the

profession. This also suggests that turnover intention can be used as a predictor of actual turnover (Price, 2004).

Among the three independent variables, working conditions is the most influential factor on teachers' turnover decisions. Moreover, working conditions has a larger impact on job satisfaction than it does on either turnover intention or actual turnover. This suggests that working conditions are more closely associated with the extent to which teachers are satisfied with their jobs than they are with teachers intentions and decisions about whether to stay or leave teaching.

### **The Impact of Salary**

Since the 1980's, teacher turnover research has been focused on the influence of teacher salary. Previous studies have found that teachers with lower salaries have higher attrition rates though the impact was relatively small (Darling-Hommond & Sclan, 1996; Ingersoll, 2001; Stinebrickner, 2001; Murnane et al., 1991), especially compared to that of working conditions (Loeb, Darling-Hmmond, & Luczak, 2003). This study confirmed these findings, using academic base salary as the indicator for salary.

#### **Job Satisfaction and Turnover Intention**

Salary was positively associated with teachers' job satisfaction ( $\tilde{\beta} = .09$ ). Consistent with previous studies, teachers were more likely to be satisfied when their salary was high, though the impact of salary on job satisfaction was small compared to that of working conditions (Fraser et al., 1998; Perie & Baker, 1997). Salary, an extrinsic rather than intrinsic motivator, does not seem to be a particularly important dimension in their overall job satisfaction (Frakes, 2000; Ingersoll, 2001; NCTAF, 2003).

#### **Actual Turnover**

Salary had a negative and direct impact on actual turnover ( $\tilde{\beta} = -.08$ ), like previous studies (Brewer, 1996; Hanushek, Kain, & Rivkin, 1999; Ingersoll, 2001; Stinebrickner,

1998). Though the magnitude of this impact was about two times less than that for working conditions, teachers who received more salary were still less likely to leave the profession.

The association between salary and actual turnover was fully mediated by job satisfaction. Teachers who received higher base salary were more likely to be satisfied and were less likely to leave the profession. When teachers' base salary increase by one standard deviation, teachers' turnover decision to leave decrease by .024 standard deviation. Through the mediation of job satisfaction, the impact of salary on actual turnover decrease .056 standard deviation compared to the direct impact in the relative model, indicating a weak mediating effect of job satisfaction. This result reflects a weak association between salary and job satisfaction. Since the direct of salary on turnover intention is not significant, turnover intention did not have a mediating effect on the association between salary and actual turnover. These findings suggested that salary is not influential factor affecting teachers' job satisfaction and actual turnover, compared to working conditions.

### **The Impact of Professional Training Experiences**

Teachers need to continually build on their skills and adapt to changing standards, curriculum, culture and technology. Professional development opportunities allow teachers to stay abreast of current practices and grow in areas critical to their performance in the classroom. The importance of professional development program has been discussed in policy circles for the last few years (National Commission on Teaching and America's Future, 2003), but not much research has been conducted in this area. Most of the studies cited in the previous turnover literature did not include measures of teacher professional training experiences in their models, and not all data sets include this information. This study includes all of these measures from the SASS dataset in a comprehensive model.

Unlike a few previous studies (Louis, 1998; Smith & Rowley, 2005), teachers' professional training experiences did not have any significant impact on job satisfaction,

turnover intention, or actual turnover. Perhaps this is because the SASS did not provide teachers' perceptions about the quality of professional development programs. Though the SASS included some items asking about program usefulness, it did not include ways to measure whether the professional development experiences to which teachers are exposed have the qualities of effective programs – namely, active learning opportunities, opportunities to engage in leadership roles, extended duration and intensity, and the collective participation of groups of teachers from the same school and grade (Garet, Birman, Porter, Desimone, & Herman, 1999; Little, 1993). It is possible that teachers are more satisfied and are less likely to leave teaching when the professional development opportunities to which they are exposed are of high quality. The findings here suggest that the number of professional training experiences a teacher has alone may not influence teachers' overall job satisfaction, turnover intention, or actual turnover.

In addition, the proportion of variance associated with actual turnover explained by the models was small. Specifically, the relative weight model examining the association between the three independent variables and actual turnover explained only 4 percent of the variance. Six percent and 12 percent of the variance were explained by the mediating model of job satisfaction and the final structural model, respectively. These low levels of explained variance could be explained by the external factors unmeasured in this study (e.g., better job opportunities out of school system and family situations).<sup>37</sup> Another explanation could be drawn the low attrition rate of the sample (i.e., 5% in the weighted sample).

### **Policy Implications and Recommendations**

By recognizing the significant effects of working conditions and salary on teachers'

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<sup>37</sup> A small proportion of the variance explained of actual turnover by the model might be caused by the model misspecification. However, comparing three types of the models containing different constructs (i.e., relative weight model, mediating model, and final structural model) did not support the hypothetical assumption. There were slightly differences in the explained variance of actual turnover among the models, partly supporting the influences of external factors.

turnover decisions, districts, schools, and other educational institutions can take measures to improve salaries and working conditions to increase job satisfaction and the retention of teachers. Forced by scarce resources to choose between them, policy makers should focus on improving working conditions. Exactly how to do so is difficult to say. The working conditions variables comprised five factors, including student misbehavior, family/parent support, principal leadership/administrative support, teacher influence over school policy, and teacher control in their classrooms.

In addition to what the educational literature have often discussed as problems for teachers (e.g., student misbehavior and parent involvement), the actual behaviors of principals in communicating with teachers about their roles, instructional practice, collaboration with other teachers, and school policies are granted in doing their job, are also significant in making the environment more workable and pleasant for teachers. What teachers value in terms of administrative support should be the topic of future research. When teachers speak of administrative support, what do they mean and does what they mean vary by teacher age or experience? Do new teachers, for example, value mentorship opportunities provided by administrators while senior teacher value the freedom to make their own decisions about what to teach and how to teach and opportunities to participate in school decision-making, etc?

These findings imply that more attention should be paid to hiring effective principals and increasing the professional development for current principals in how they might better support their instructional staffs. Doing so might be complicated by what some have called a shortage of qualified principals (NAESP/NASSP/ERS, 2000).

According to Fenwick (2000), across the country, the number of applications for the principal-ship is declining. In a national study, nearly half of all urban, suburban, and rural school districts reported shortages of interested candidates for principal positions (Jones, 2001). A study on principals' perceptions about their jobs and their career decisions with a

similar model employed in this study could identify the factors that influence the career decisions of principal candidates and current principals. The results of such a study might give insights into the relationships among working conditions, teacher turnover, and principal leadership.

In addition, policy makers might consider ways to increase the influence of teachers over school policies. They might, for example, work to expand site based councils that involve teachers. Site based management may be an effective tool not only for increasing teachers' job satisfaction but also furthermore school performance. Sharing decision-making power and corresponding responsibility over school policies such as the budget, personnel, disciplines, and curriculum can bring about meaningful change in teaching and learning through the establishment of a clearly articulated vision and through the collaborative work of principals and teachers who have been trained about their new roles and responsibilities (Holloway, 2000; Odden & Wohstetter, 1995).

While this study covered many variables that are relevant to the teacher turnover process, there are others that were not included in the study due to the data limitations. These variables include teachers' opportunity for promotion and job security, the quality of professional development, and teachers' exposure to and attitudes about high-staking tests and accountability. Scholars should look for opportunities to collect data that allow for the investigation of these variables under the similar framework of structural equation model. Future studies that include these variables will provide a better picture of the teacher turnover phenomenon.

## APPENDIX A. The 1999-2000 SASS Items and Coding

Table 1 Dependent Variables

Construct	Code	Content	Scale	Recode	Recoded Variables
Actual Turnover	STATUS for stayers	TFS final teacher status from TFS for the current teachers and former teachers	S=stayer, M=mover, S=Leaver	Created variable by NCES; Recode: drop "movers"	
	T0051	How do you classify your main assignment at THIS school, that is, the activity at which you spend most of your time during this school year?	1=Regular full-time teacher 2=Regular part-time teacher, 3=Itinerant teacher 4=Long-term substitute 8=Administrator (e.g., principal, assistant principal, director) 9=Library media specialist or librarian 10=Other professional staff (e.g., counselor, curriculum coordinator)	Select; 1	
	F0053	What is your MAIN occupational status?	1=Working IN an elementary or secondary education occupation 2=Working in an education occupation OUTSIDE of elementary or secondary education 3=Working in an occupation outside the field of education 4=Student at a college or university 5=Caring for family members 6=Retired 7=Disabled, 8=Unemployed and seeking work, 9=Other	Select; 3	
Turnover Intention					
	T0340	How long do you plan to remain in teaching?	1=As long as I am able, 2=Until I am eligible for retirement, 3=Will probably continue unless something better comes along, 4=Definitely plan to leave teaching as soon as possible, 5=Undecided at time	Reverse recode; 5=undecided at time to 3, 3 to 4, 4 to 5	RE_T0340
	T0339	If you could go back to your college days and start over again, would you become a teacher or not?	1=Certainly would become a teacher, 2=Probably would become a teacher, 3=Chances about even for and against, 4=Probably would not become a teacher, 5=Certainly would not become a teacher	Reverse recode	RE_T0339
Job Satisfaction					
	T0318	I sometimes feel it is a waste of time to try to do my best as a teacher.	1=Strongly agree ~ 4=Strongly disagree		
	T0320	I am generally satisfied with being a teacher at this school.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0320

Table 2 Independent Variables

Construct	Code	Content	Scale	Recode	Recoded Variables
Salary					
		During the summer of 1999, did you have any earnings from			
	T0341/ T0342	teaching summer school in this or any other school?	1=Yes (How much), 2=No	Recode; -8 to 0	RE_T0342
	T0343/ T0344	Working in a nonteaching job in this or any other school?	1=Yes (How much), 2=No	Recode; -8 to 0	RE_T0344
	T0345/ T0346	Working in any NONSCHOOL job?	1=Yes (How much), 2=No	Recode; -8 to 0	RE_T0346
		During the current school year,			
	T0347	what is your academic year base teaching salary?	Dollars		
	T0348/ T0349	do you, or will you, earn any additional compensation from this school system for extracurricular or additional activities such as coaching, student activity sponsorship, or teaching evening classes?	1=Yes (How much), 2=No	Recode; -8 to 0	RE_T0349
	T0350/ T0351	Have you earned income from any OTHER school sources this year, such as a merit pay bonus, state supplement, etc.?	1=Yes (How much), 2=No	Recode; -8 to 0	RE_T0351
	T0352/ T0353	Do you, or will you, earn additional compensation from working in any job OUTSIDE this school system?	1=Yes (How much), 2=No	Recode; -8 to 0	RE_T0353
Working Conditions					
	T0299	The principal lets staff members know what is expected of them.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0299
	T0300	The school administrator's behavior toward the staff is supportive and encouraging.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0300
	T0306	My principal enforces school rules and backs me up when I need it.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0306
	T0310	The principal knows what kind of school he/she wants and has communicated it to the staff.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0310
	T0308	Rules for student behavior are consistently enforced by teachers in this school, even for students who are not in their classes.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0308

Table 2 Independent Variables -- Continued

Construct	Code	Content	Scale	Recode	Recoded Variables
Working Conditions	T0309	Most of my colleagues share my beliefs and values about what the central mission of the school should be.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0309
	T0311	There is a great deal of cooperative effort among the staff members.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0311
	T0316	I make a conscious effort to coordinate the content of my courses with that of other teachers.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0316
	T0319	I plan with the library media specialist/librarian for the integration of library media services into my teaching.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0319
	T0303	I receive a great deal of support from parents for the work I do.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0303
		How much influence do you think teachers have over school policy?			
	T0286	Setting performance standards.	1=No influence ~ 5=Great influence	N/A	N/A
	T0287	Establishing curriculum.	1=No influence ~ 5=Great influence	N/A	N/A
	T0288	Determining the content of in-service professional development.	1=No influence ~ 5=Great influence	N/A	N/A
	T0289	Evaluating teachers.	1=No influence ~ 5=Great influence	N/A	N/A
	T0290	Hiring new teachers.	1=No influence ~ 5=Great influence	N/A	N/A
	T0291	Setting discipline policy.	1=No influence ~ 5=Great influence	N/A	N/A
	T0292	Deciding how the school budget will be spent.	1=No influence ~ 5=Great influence	N/A	N/A
		How much control do you think you have in your classroom over planning and teaching?			
	T0293	Selecting textbooks and other instructional material.	1=No control ~ 5=Complete control	N/A	N/A
	T0294	Selecting content, topics, and skills to be taught.	1=No control ~ 5=Complete control	N/A	N/A
	T0295	Selecting teaching techniques.	1=No control ~ 5=Complete control	N/A	N/A
	T0296	Evaluating and grading students.	1=No control ~ 5=Complete control	N/A	N/A
	T0297	Disciplining students.	1=No control ~ 5=Complete control	N/A	N/A

Table 2 Independent Variables -- Continued

Construct	Code	Content	Scale	Recode	Recorded Variables
Working Conditions	T0298	Determining the amount of homework to be assigned.	1=No control ~ 5=Complete control	N/A	N/A
	T0279	How many times did you have to interrupt your class(es) to deal with student misbehavior or disruption?	Times		
	T0302	The level of student misbehavior (such as noise, horseplay or fighting in the halls, cafeteria or student lounge) in this school interferes with my teaching.	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0317	The amount of student tardiness and class cutting in this school interferes with my teaching.	1=Serious Problem ~4=Not a Problem	N/A	N/A
		To what extent is each of the following a problem in this school?			
	T0321	Student tardiness	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0322	Student absenteeism	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0324	Students cutting class	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0325	Physical conflicts among students	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0326	Robbery or theft	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0327	Vandalism of school property	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0328	Student pregnancy	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0329	Student use of alcohol	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0330	Student drug abuse	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0331	Student possession of weapons	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0332	Student disrespect for teachers	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0333	Students dropping out	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0334	Student apathy	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0335	To what extent is lack of parental involvement a problem in this school?	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0336	Poverty	1=Serious Problem ~4=Not a Problem	N/A	N/A
	T0337	Students come to school unprepared to learn.	1=Serious Problem ~4=Not a Problem	N/A	N/A

Table 2 Independent Variables -- Continued

Construct	Code	Content	Scale	Recode	Recoded Variables
Working Conditions	T0273	How many hours were you required to be at this school during your most recent full week of teaching?	Hours	N/A	
	T0274	In your most recent full week of teaching, how much scheduled school time did you have for planning?	Hours	N/A	
	T0276	During your most recent full week of teaching, how many hours did you spend after school, before school, and on the weekend on each of the following types of activities? School-related activities involving student interaction, such as coaching, field trips, tutoring, transporting students.	Hours	N/A	
	T0277	Other school-related activities, such as preparation, grading papers, parent conferences, attending meetings.	Hours	N/A	
	T0304	Necessary materials such as textbooks, supplies, copy machines are available as needed by the staff.	1=Strongly agree ~ 4=Strongly disagree	Reverse recode	RE_T0304
	T0305	Routine duties and paperwork interfere with my job of teaching.	1=Strongly agree ~ 4=Strongly disagree	N/A	N/A
Professional Training Experiences					
		In the past 12 months, have you participated in the following activities RELATED TO TEACHING?			
	T0150	a. University course(s) taken for recertification or advanced certification in your MAIN teaching assignment field or other teaching field.	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0150

Table 2 Independent Variables -- Continued

<b>Construct</b>	<b>Code</b>	<b>Content</b>	<b>Scale</b>	<b>Recode</b>	<b>Recorded Variables</b>
Professional Training Experiences	T0151	b. University course(s) in your MAIN teaching assignment field.	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0151
	T0152	c. Observational visits to other schools.	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0152
	T0153	d. Individual or collaborative research on a topic of interest to you professionally.	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0153
	T0154	e. Regularly-scheduled collaboration with other teachers on issues of instruction.	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0154
	T0155	f. Mentoring and/or peer observation and coaching, as part of a formal arrangement that is recognized or supported by the school or district.	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0155
	T0156	g. Participating in a network of teachers (e.g., one organized by an outside agency or over the Internet).	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0156
	T0157	h. Attending workshops, conferences or training.	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0157
	T0158	i. Workshops, conferences or training in which you were the presenter.	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0158
	T0159	In the past 12 months, have you participated in any professional development activities that focused on in-depth study of the content in your MAIN teaching assignment field?	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0159
T0160	In the past 12 months, how many hours did you spend on the activities?	1=8 hours or less, 2=9~16 hours, 3=17~32 hours, 4=33 hours or more	Recode; -8 to 0	RE_T0160	
T0161	Overall, how useful were these activities to you?	1=Not useful at all ~ 5=Very useful	Not required	RE_T0161, 0=not participate	
T0162	In the past 12 months, have you participated in any professional development activities that focused on content and performance standards in your MAIN teaching assignment field?	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0162	
T0163	In the past 12 months, how many hours did you spend on the activities?	1=8 hours or less, 2=9~16 hours, 3=17~32 hours, 4=33 hours or more	Recode; -8 to 0	RE_T0163	

Table 2 Independent Variables -- Continued

<b>Construct</b>	<b>Code</b>	<b>Content</b>	<b>Scale</b>	<b>Recode</b>	<b>Recorded Variables</b>
Professional Training Experiences	T0164	Overall, how useful were these activities to you?	1=Not useful at all ~ 5=Very useful	Not required	RE_T0164, 0=not participate
	T0165	In the past 12 months, have you participated in any professional development activities that focused on methods of teaching?	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0165
	T0166	In the past 12 months, how many hours did you spend on the activities?	1=8 hours or less, 2=9~16 hours, 3=17~32 hours, 4=33 hours or more	Recode; -8 to 0	RE_T0166
	T0167	Overall, how useful were these activities to you?	1=Not useful at all ~ 5=Very useful	Not required	RE_T0167, 0=not participate
	T0168	In the past 12 months, have you participated in any professional development activities that focused on uses of computers for instruction?	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0168
	T0169	In the past 12 months, how many hours did you spend on the activities?	1=8 hours or less, 2=9~16 hours, 3=17~32 hours, 4=33 hours or more	Recode; -8 to 0	RE_T0169
	T0170	Overall, how useful were these activities to you?	1=Not useful at all ~ 5=Very useful	Not required	RE_T0170, 0=not participate
	T0171	In the past 12 months, have you participated in any professional development activities that focused on student assessment, such as methods of testing, evaluation, performance assessment, etc?	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0171
	T0172	In the past 12 months, how many hours did you spend on the activities?	1=8 hours or less, 2=9~16 hours, 3=17~32 hours, 4=33 hours or more	Recode; -8 to 0	RE_T0172
	T0173	Overall, how useful were these activities to you?	1=Not useful at all ~ 5=Very useful	Not required	RE_T0173, 0=not participate
	T0174	In the past 12 months, have you participated in any professional development activities that focused on student discipline and management in the classroom?	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	RE_T0174
	T0175	In the past 12 months, how many hours did you spend on the activities?	1=8 hours or less, 2=9~16 hours, 3=17~32 hours, 4=33 hours or more, -8=valid skip	Recode; -8 to 0	RE_T0175

Table 2 Independent Variables -- Continued

Construct	Code	Content	Scale	Recode	Recorded Variables
Professional Training Experiences	T0176	Overall, how useful were these activities to you?	1=Not useful at all ~ 5=Very useful	Not required	RE_T0176, 0=not participate
	T0178	Thinking about all the professional development you have participated in over the 12 months, how useful was it?	1=Not useful at all ~ 5=Very useful	Not required	
		For the professional development in which you participated in the last 12 months, did you receive the following types of support?			
	T0179	a. Release time from teaching (i.e., your regular teaching responsibilities were temporarily assigned to someone else)	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	
	T0180	b. Scheduled time in the contract year for professional development	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	
	T0181	c. Stipend for professional development activities that took place outside regular work hours	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	
	T0182	d. Full or partial reimbursement of college tuition	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	
	T0183	e. Reimbursement for conference or workshop fees	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	
	T0184	f. Reimbursement for travel and/or daily expenses	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	
		As a result of completing these professional development activities, did you receive the following rewards?			
	T0185	a. Credits towards re-certification or advanced certification in your main teaching assignment field or other teaching field(s)	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	
	T0186	b. Increase in salary or other pay increases as a result of participating in professional development activities	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	

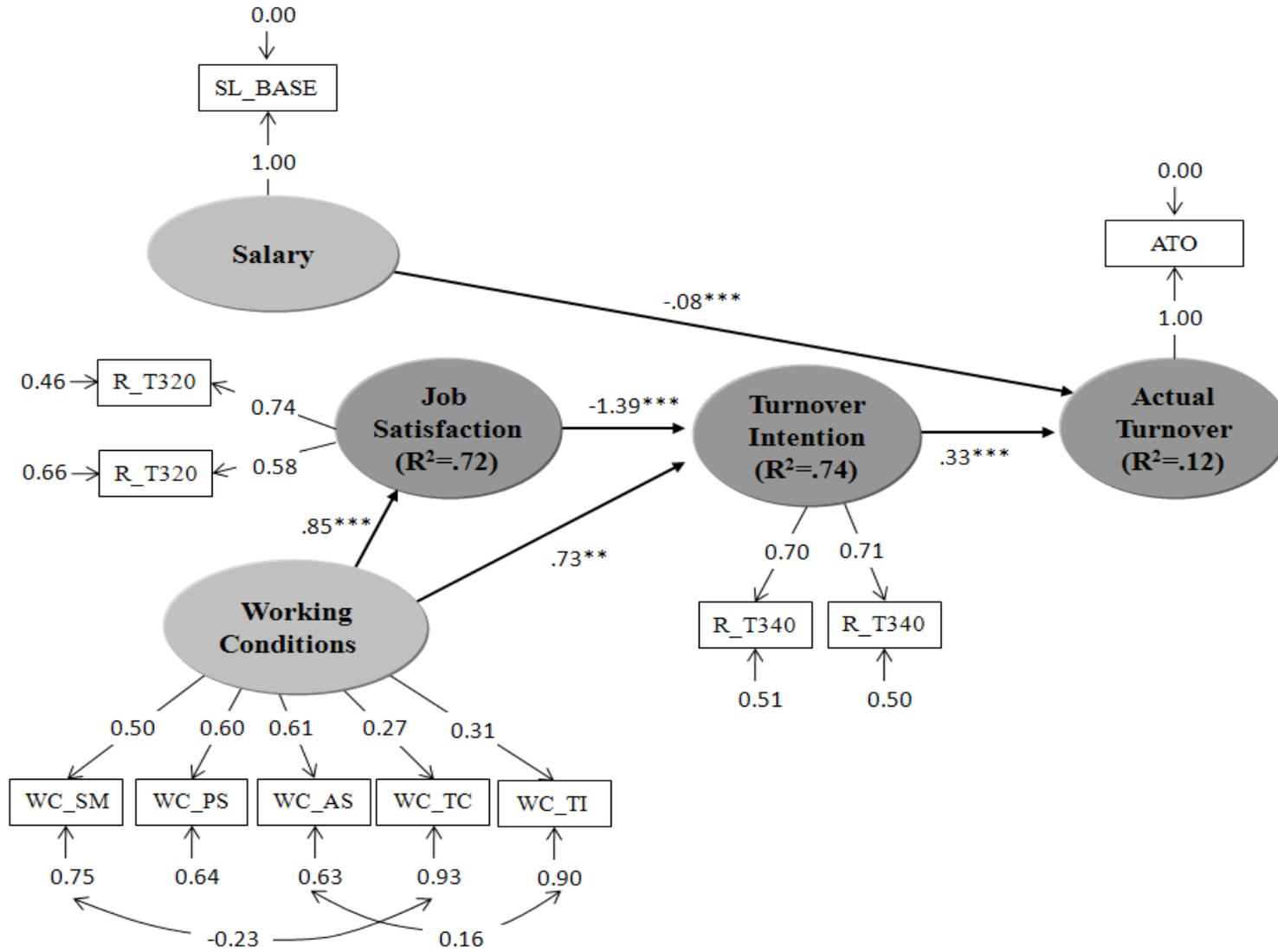
Table 2 Independent Variables -- Continued

Construct	Code	Content	Scale	Recode	Recorded Variables
Professional Training Experiences	T0187	c. Recognition or higher ratings on an annual teacher evaluation	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	
Teacher Characteristics					
	T0356		1=Male, 2=Female	Recode; 0=female, 1=male	R_GENDER_T
	T0070	Do you have a bachelor's degree?	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	R_BA_T
	T0080	Do you have a master's degree?	1=Yes, 2=No, -8=Valid skip	Recode; 2 to 0, 1 to 1, -8 to	R_MA_T
	T0099	What other degree(s) have you earned? Doctorate or first professional degree?	1= Doctorate or first professional degree -8=Valid skip	Recode; 1 to 1, -8 to 0	R_PHD_T
	T0103	Do you have a teaching certificate in this state in your MAIN teaching assignment field?	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	R_CERTIF_T
	T0104	What type of certificate do you hold in this field (main teaching assignment field)?	1=Regular or standard state certificate or advanced professional certificate, 2=Probationary certificate (the initial certificate issued after satisfying all requirements, 3=Provisional or other type given to persons who are still participating in what the state calls an "alternative certification program," 4=Temporary certificate (requires some additional college coursework and/or student teaching before regular certification can be obtained), 5=Emergency certificate or waiver (issued to persons with insufficient teacher preparation who must complete a regular certification program in order to continue teaching), -8=Valid skip	Recode; -8 to 0 (no certificate), 2 to 1, 3 to 1, 4 to 1, 5 to 1 (not regular), 1 to 2 (regular, state, or advanced)	R_CERTYPE_T
	T0113	Do you currently hold ANY ADDITIONAL regular or standard state certificate or advanced professional certificates in this state or any other state?	1=Yes, 2=No	Recode; 2 to 0, 1 to 1	R_CERTOTH_T
	AGE_T	Teacher age		- Created variable by NCES - Not required	

Table 2 Independent Variables -- Continued

Construct	Code	Content	Scale	Recode	Recorded Variables
Teacher Characteristics	RACETH_T	Teacher race/ethnicity	1=American Indian or Alaska Native, 2=Asian or Pacific Islander, 3=Black, 4=White, 5=Hispanic	- Created variable by NCES. - Recode; 1=white, 2=Black, 3=Hispanic, 4=Asian, 5=American Indidan	R_RACETH_T
	NEWTCH	New teacher flag	1=Teacher has taught 3 years or less, 2=Teacher has taught more than 3 years	- Created variable by NCES. - Recode; 2=0, 1=1	R_NEWT
	TSUBJ	Subject flag recode	1=Special education elementary, 2=General elementary, 3=Mathematics, 4=Science, 5=English, 6=Social studies, 7=Vocational/Technical, 8=Other	-Created variable by NCES - Not required	
	TOTEXPER	Total teaching experience	Teacher's total number of years teaching full and part-time and in private and public schools.	- Created variable by NCES. - Not required	
School Characteristics					
	TEALEV2	Teaching level	1=elementary, 2=secondary	Created variable by NCES	
	URBANIC	Urbanicity of school	1=large or mid-size central city, 2=urban fringe of large or mid-size city, 3=small town/rural	Created variable by NCES	
	ENRK12UG	School ungraded and K-12 enrollment		Created variable by NCES	
	STU_TCH	Estimated student-teacher ratio		Created variable by NCES	
	MINENR	Percent minority students at this school		Created variable by NCES	
	LEP_T	Percent students with LEP		Created variable by NCES	

**APPENDIX B. The Final Structural Model with Indicators**



## REFERENCES

- Adams, G. J. (1996). Using a Cox regression model to examine voluntary teacher turnover. *Journal of Experimental Education, 64*(3), 267-285.
- Angrist, J. D., & Lavy, V. (2001). Does teacher training affect pupil learning? Evidence from matched comparisons in Jerusalem public schools. *Journal of Labor Economics, 19*(2), 343-369.
- Arvey, R. D., Rotundo, M., Johnson, W., Zhang, Z., & McGue, M. (2006). The determinants of leadership role occupancy: Genetic and personality factors. *The Leadership Quarterly, 17*(1), 1-20.
- Bagozzi, R. P., & Edwards, J. R. (1998). A general approach for representing constructs in organization research. *Organizational Research Methods, 1*(1), 45-87.
- Baker, D., & Smith, T. (1997). Teacher turnover and teacher quality: Refocusing the issue. *Trend 2. Teachers College Record, 99*(1), 29-35.
- Ballou, D., & Podgursky, M. (1997). *Teacher pay and teacher quality*. Kalamazoo, MI: W.E. Upjohn Institute.
- Barnes, L. L. B., Agago, M. O., & Coombs, W. T. (1998). Effects of job-related stress on faculty intention to leave academia. *Research in Higher Education, 39*(4), 457-469.
- Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis with special reference to education* (3rd ed.). Chicago: University of Chicago Press.
- Betts, J. R., Reuben, K. S., & Danenberg, A. (2000). *Equal resources, equal outcomes? The distribution of school resources and student achievement in California*. San Francisco: Public Policy Institute of California.
- Billingsley, B., & Cross, L. (1991). General education teachers' interest in special education teaching: Deterrents, incentives, and training needs. *Teacher Education and Special Education, 14*(3), 162-168.
- Blair, J. (2001). Lawmakers plunge into teacher pay. *Education Week* (February 25).

- Blase, J., & Kirby, P. (1992). *Bringing out the best in teachers: What effective principals do*. Newbury Park, CA: Corwin Press.
- Bluedorn, A. C. (1982). A Unified Model of Turnover from Organizations. *Human Relations*, 35(2), 135-153.
- Bobbitt, S., Leich, M., Whitener, S., & Lynch, H. (1994). *Characteristics of stayers, movers and leavers: Results from the Teacher Follow up Survey 1991-1992* (No. NCES 94337). Washington, DC: National Center for Educational Statistics.
- Boe, E., Barkanic, G., & Leow, C. (1999). *Retention and attrition of teachers at the school level: National trends and predictors* (Data Analysis Report No. 1999-DAR1). Philadelphia: University of Pennsylvania, Graduate School of Education, Center for Research and Evaluation in Social Policy.
- Boe, E. E., Bobbitt, S. A., & Cook, L. H. (1997). Whither didst thou go? Retention, reassignment, migration, and attrition of special and general education teachers from a national perspective. *Journal of Special Education*, 30(4), 371-389.
- Boe, E. E., Bobbitt, S. A., Cook, L. H., Whitener, S. D., & Weber, A. L. (1997). Why didst thou go? Predictors of retention, transfer, and attrition of special and general education teachers from a national perspective. *Journal of Special Education*, 30(4), 390-411.
- Brewer, D. (1996). Career paths and quit decisions: Evidence from teaching. *Journal of Labor Economics*, 14(2), 313-339.
- Byrne, B. M. (1998). *Structural equation modeling with LISREL, PRELIS, and SIMPLIS: Basic concepts, applications, and programming*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Cappella, E., & Weinstein, R. S. (2001). Turning around reading achievement: Predictors of high school students' academic resilience. *Journal of Educational Psychology*, 93(4), 758-771.
- Chandler, K. (2004). *Teacher attrition and mobility: Results from the Teacher Follow-up Survey, 2000-01* (Statistical Analysis Report No. NCES 2004301). Washington, DC: National Center for Education Statistics.

- Chapman, D. W. (1984). Teacher retention: The test of a model. *American Educational Research Journal*, 21(3), 645-658.
- Chapman, D. W., & Green, M. S. (1986). Teacher retention: A further examination. *The Journal of Educational Research*, 79(4), 273-279.
- Choy, S. P., Chen, X., & Ross, M. (1998). *Toward better teaching: Professional development in 1993-1994* (Statistical Analysis Report No. NCES 98230). Washington, DC: National Center for Education Statistics.
- Clark, A. E. (1997). Job satisfaction and gender: Why are women so happy at work? *Labor Economics*, 4(4), 341-372.
- Clark, A. E., Oswald, A. J., & Warr, P. B. (1994). Is job satisfaction U-shaped in age? *Journal of Occupational and Organizational Psychology*, 69, 57-81.
- Clift, R. T., Veal, M. L., Holland, P., Johnson, M., & McCarthy, J. (1995). *Collaborative leadership and shared decision making: Teachers, principals, and university professors*. New York: Teachers College Press.
- Clugston, M. (2000). The mediating effects of multidimensional commitment on job satisfaction and intent to leave. *Journal of Organizational Behavior*, 21(4), 477-486.
- Coffman, D. L., & MacCallum, R. C. (2005). Using parcels to convert path analysis models into latent variable models. *Multivariate Behavioral Research*, 40(2), 235-259.
- Cohen-Vogel, L., & Smith, T. M. (2007). Qualifications and Assignments of Alternately Certified Teachers: Testing Core Assumptions. *American Educational Research Journal*, 44(3), 732-753.
- Conley, S. (1991). Review of research on teacher participation in school decision making. In G. Grant (Ed.), *Review of research in education* (Vol. 17, pp. 225-266). Washington, DC: American Educational Research Association.
- Cooperman, S. (2000, January 26). They sky is not falling! *Education Week*, 19.
- Cudeck, R., & Browne, M. W. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 1-9). Newbury Park,

CA: Sage.

Currivan, D. B. (1999). The causal order of job satisfaction and organizational commitment in models of employee turnover. *Human Resource Management Review*, 9(4), 495-524.

Darling-Hammond, L. (1999). *Solving the dilemmas of teacher supply, demand, and standards: How we can ensure a competent, caring, and qualified teacher for every child*. New York, NY: National Commission on Teaching & America's Future.

Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence. *Education Policy Analysis Archives*, 8(1).

Darling-Hammond, L., & Sclan, E. M. (1996). Who teaches and why. In J. Sikula (Ed.), *Handbook of Research on Teacher Education* (pp. 67-101). New York, NY: Simon Schuster Macmillan.

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.

Ehrenberg, R. G., & Smith, R. S. (2003). *Modern labor economics: Theory and public policy* (8th ed.). New York, NY: Addison Wesley Longman, Inc.

Evans, L. (2001). Delving deeper into morale, job satisfaction and motivation among education professionals: Re-examining the leadership dimension. *Educational Management Administration*, 29, 291-306.

Evans, R. (1996). *The human side of school change: Reform, resistance, and the real life problems of innovation*. San Francisco, CA: Josey-Bass Publishers.

Evertson, C. M., & Weinstein, C. S. (Eds.). (2006). *The handbook of classroom management: Research, practice, & contemporary issues*. Mahwah, NJ: Lawrence Erlbaum Associates.

Fan, X., Thompson, B., & Wang, L. (1999). Effects of sample size, estimation methods, and model specification on structural equation modeling fit indexes. *Structural Equation Modeling*, 6, 56-83.

- Fan, X., & Wang, L. (1998). Effects of potential confounding factors on fit indices and parameter estimates for true and misspecified SEM models. *Educational and Psychological Measurement, 58*, 699-733.
- Farkas, S., Johnson, J., & Foleno, T. (2000). *A Sense of Calling: Who Teaches and Why*. New York: Public Agenda.
- Feistritzer, E. E., & Chester, D. T. (2001). *Alternative certification: A state by state analysis 2001*. Washington, DC: National Center for Education Information.
- Feldman, D. C. (1996). Managing careers in downsizing firms. *Human Resource Management, 35*(2), 145-161.
- Fenwick, L. T. (2000). *The principal shortage: Who will lead?* Cambridge, MA: The Principals' Center, Harvard Graduate School of Education.
- Fraser, H., Draper, J., & Taylor, W. (1998). The quality of teachers' professional lives: Teachers and job satisfaction. *Evaluation and Research in Education, 12*(2), 61-71.
- Garet, M., Birman, B., Porter, A., Desimone, L., & Herman, R. (1999). *Designing effective professional development: Lessons from the Eisenhower Program*. Washington, DC: U.S. Department of Education.
- Goldhaber, D. D. (2001). How has teacher compensation changed? In W. J. Fowler (Ed.), *Selected papers in school finance, 2000-01* (pp. 11-39). Washington, DC: National Center of Education Statistics.
- Gribbons, B. C., & Hocevar, D. (1998). Levels of aggregation in higher level confirmatory factor analysis: Application for academic self-concept. *Structural Equation Modeling, 5*(4), 377-390.
- Griffeth, R. W., Hom, P. W., & Gaertner, S. (2000). A meta-analysis of antecedents and correlates of employee turnover: Update, moderator tests, and research implications for the millennium. *Journal of Management, 26*, 463-488.
- Grissmer, D. W., & Kirby, S. N. (1987). *Teacher attrition: The uphill battle to staff the nation's schools*. Santa Monica, CA: RAND.

- Grissmer, D. W., & Kirby, S. N. (1997). Teacher turnover and teacher quality. *Teachers College Record*, 99(1), 45-56.
- Gritz, R. M., & Theobald, N. D. (1996). The effects of school district spending priorities on length of stay in teaching. *Journal of Human Resources*, 31(3), 477-512.
- Gruber, K. J., Wiley, S. D., Broughman, S. P., Strizek, G. A., & Burian-Fitzgerald, M. (2002). *Schools and Staffing Survey, 1999-2000: Overview of the data for public, private, public charter, and Bureau of Indian Affairs elementary and secondary schools*. Washington, D.C.: National Center for Education Statistics.
- Guskey, T. R. (2003). What makes professional development effective? *Phi Delta Kappa*, 84(10), 748-750.
- Guskey, T. R., & Peterson, K. D. (1996). The road to classroom change. *Educational Leadership*, 53(4), 10-14.
- Guskey, T. R., & Sparks, D. (1991). What to consider when evaluating staff development. *Educational Leadership*, 49(3), 73-76.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). Upper Saddle River, NJ: Prentice-Hall International.
- Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (1999). *Do higher salaries buy better teachers?* (Working Paper No. 7082). Cambridge, MA: National Bureau of Economic Research.
- Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (2004). Revolving door. *Education Next*, Winter 2004.
- Harris, D., & Adams, S. (2004). *Is Teacher Turnover High or Just Different? A Comparison with Other Professionals*. Paper presented at the 2004 annual conference of the American Education Finance Association, Salt Lake City, Utah.
- Harris, D. N., & Adams, S. J. (2007). Understanding the level and causes of teacher turnover: A comparison with other professions. *Economics of Education Review*, 26(3), 325-337.
- Hassel, B. C. (2002). *Better pay for better teaching: Making teacher compensation pay off*

*in the age of accountability*. Washing, DC: Progressive Policy Institute. ERIC Document Reproduction Service No. ED467050

- Hawley, W. D., & Valli, L. (2001). The essentials of effective professional development: A new consensus. In D. Boesel (Ed.), *Continuing professional development* (pp. 1-17). Washington, DC: U.S. Department of Education, National Library of Education.
- Hellman, C. M. (1997). Job satisfaction and intent to leave. *The Journal of Social Psychology*, *137*(6), 677-689.
- Helms, J. E., Henze, K. T., Sass, T. L., & Mifsud, V. A. (2006). Treating Cronbach's Alpha reliability coefficients as data in counseling research. *The Counseling Psychologist*, *34*(5), 630-660.
- Henke, R. R., Chen, X., Geis, S., & Knepper, P. (2000). *Progress through the teacher pipeline: 1992-93 college graduates and elementary/secondary school teaching as of 1997* (Statistical Analysis Report No. NCES 2000-152). Washington, DC: National Center for Education Statistics.
- Herzberg, F. (1968). *Work and the nature of man*. London: Staple Press.
- Hess, F., & Petrilli, M. (2006). *No child left behind*. New York: Peter Lang Publishing.
- Hirsch, E. (2005). *Teacher working conditions are student learning conditions: A report to Governor Mike Easley on the 2004 North Carolina Teacher Working Conditions Survey*. Chapel Hill, NC: Southeast Center for Teaching Quality.
- Hirsch, E., Emerick, S., Church, K., & Fuller, E. (2007). *Teacher working conditions are student learning conditions: A report on the 2006 North Carolina Teacher Working Conditions Survey*. Hillsborough, NC: The Center for Teaching Quality.
- Hirsch, E., Koppich, J., & Knapp, M. (2001). *Revisiting what states are doing to improve the quality of teaching: An update on patterns and trends* (Working Paper No. Document w-01-1). Seattle, WA: University of Washington, Center for the Study of Teaching and Policy.
- Holloway, J. (2000). The promise and pitfalls of site-based management. *Educational Leadership*, *57*(7), 81-82.

- Hom, P. W., & Griffeth, R. W. (1995). *Employee turnover*. Cincinnati, OH: Southwestern Publishing Company.
- Hom, P. W., & Kinicki, A. J. (2001). Toward a greater understanding of how dissatisfaction drives employee turnover. *Academy of Management Journal*, 44(5), 975-987.
- Hoyle, R. H. (1995). *Structural equation modeling: Concepts, issues, and applications*. Thousand Oaks, CA: Sage Publications.
- Hu, L.-Z., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
- Huberman, M. (1993). *The lives of teachers*. New York: Teachers College Press.
- Hussar, W. J. (1999). *Predicting the need for newly hired teachers in the United States to 2008-09* (Research and Development Report No. NCES 99026). Washington, DC: National Center for Education Statistics.
- Ingersoll, R. M. (1998). The problem of out-of-field teaching. *Phi Delta Kappa*, 79(10), 773-776.
- Ingersoll, R. M. (2001). *Teacher turnover, teacher shortages, and the organization of schools* (No. Document R-01-1). Seattle, WA: University of Washington, Center for the Study of Teaching and Policy.
- Ingersoll, R. M. (2002). Holes in the teacher supply bucket. *School Administrator*, 59(3), 42-43.
- Ingersoll, R. M. (2003a). *Is there really a teacher shortage?* Seattle, WA: Center for the Study of Teaching and Policy.
- Ingersoll, R. M. (2003b). *Who controls teachers' work? Power and accountability in America's schools*. Cambridge, MA: Harvard University Press.
- Ingersoll, R. M., Alsalam, N., Quinn, P., & Bobbitt, S. (1997). *Teacher professionalization and teacher commitment: A multilevel analysis* (No. NCES 97069). Washington, DC: National Center for Education Statistics.

- Ingersoll, R. M., & Bobbitt, S. A. (1995). *Teacher supply, teacher qualifications, and teacher turnover: Aspects of teacher supply and demand in the U.S. 1990-91* (Statistical Analysis Report No. NCES 95744). Washington, DC: National Center for Education Statistics.
- Ingersoll, R. M., & Rossi, R. (1995). A tally of teacher turnover. *The Education Digest* (December), 39-40.
- Irvine, D. M., & Evans, M. G. (1995). Job satisfaction and turnover among nurses: Integrating research findings across studies. *Nursing Research*, 44, 246-253.
- Jacob, B. A., & Lefgren, L. (2004). The impact of teacher training on student achievement: Quasi-experimental evidence from school reform efforts in Chicago. *The Journal of Human Resources*, 39(1), 50-79.
- Johnsrud, L. K., & Rosser, V. J. (2002). Faculty members' morale and their intention to leave: A multilevel explanation. *The Journal of Higher Education*, 73(4), 518-542.
- Jones, B. A. (2001). *Supply and demand for school principals: A national study*. Columbia, MO: Consortium for the Study of Educational Policy.
- Joreskog, K. G., & Sorbom, D. (1993). *LISREL 8: Structural equation modeling with the SIMPLIS command language*. Chicago: Scientific Software International.
- Jöreskog, K. G., & Sörbom, D. (1993). *LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language*. Chicago: Scientific Software International.
- Judge, T. A., Bono, J. E., & Locke, E. A. (2000). Personality and job satisfaction: The mediating role of job characteristics. *Journal of Applied Psychology*, 85(2), 237-249.
- Kelley, L. M. (2004). Why induction matters. *Journal of Teacher Education*, 55(5), 438 - 448.
- Kennedy, M. M. (1998). *Form and substance in in-service teacher education*. Madison, WI: the National Institute for Science Education.
- Kim, I., & Loadman, W. E. (1994). *Predicting teacher job satisfaction*. Columbus, OH: The Ohio State University. (ERIC Document Reproduction Service No. ED 383 707).

- Kirby, S. N., Berends, M., & Naftel, S. (1999). Supply and demand of minority teachers in Texas: Problems and prospects. *Educational Evaluation and Policy Analysis, 21*(1), 47-66.
- Kirby, S. N., & Grissmer, D. W. (1993). *Teacher attrition: Theory, evidence, and suggested policy options*. Santa Monica, CA: RAND.
- Kirschenbaum, A., & Weisberg, J. (1990). Predicting worker turnover: An assessment of intent on actual separations. *Human Relations, 43*(9), 829-847.
- Kline, R. B. (1998). *Principles and practices of structural equation modeling*. New York: Guilford Press.
- Knight, D., Durham, C. D., & Locke, E. A. (2001). The relationship of team goals, incentives, and efficacy to strategic risk, tactical implementation, and performance. *Academy of Management Journal, 44*(2), 326-338.
- Knight, P. (2002). A systematic approach to professional development: learning as practice. *Teaching and Teacher Education, 18*, 229-241.
- Krumboltz, J. (1979). A social learning theory of career decision making. In A. M. Mitchell, G. B. Jones & J. D. Drumboltz (Eds.), *Social learning and career decision making* (pp. 19-49). Cranston, RI: Carroll Press.
- Lambert, E. G., Hogan, N. L., & Barton, S. M. (2001). The impact of job satisfaction on turnover intent: a test of a structural measurement model using a national sample of workers. *The Social Science Journal, 38*(2), 233-250.
- Landis, R. S., Beal, D. J., & Tesluk, P. E. (2000). A Comparison of approaches to forming composite measures in structural equation models. *Organizational Research Methods, 3*(2), 186-207.
- Lankford, H., Loeb, S., & Wyckoff, J. (2002). Teacher sorting and the plight of urban schools: A descriptive analysis. *Educational Evaluation and Policy Analysis, 24*(1), 37-62.
- LeCompte, D., & Dworkin, A. G. (1991). *Giving up on school: Student dropouts and teacher burnouts*. Newbury Park, CA: Corwin.

- Lewis, A. C. (1998). 'Just say no' to unqualified teachers. *Phi Delta Kappan*, 80(3), 179-180.
- Little, J. W. (1993). Teachers' professional development in a climate of educational reform. *Educational Evaluation and Policy Analysis*, 15(2), 129-151.
- Loeb, S., Darling-Hammond, L., & Luczak, J. (2005). How Teaching Conditions Predict Teacher Turnover in California Schools. *Peabody Journal of Education*, 80(3), 44-70.
- Lortie, D. C. (1975). *Schoolteacher: A sociological study*. Chicago, IL: University of Chicago Press.
- Louis, K. S. (1998). Effects of quality of life in secondary schools on commitment and sense of efficacy. *School Effectiveness and School Improvement*, 9(1), 1-27.
- Ma, Xin, & MacMillan, R. B. (1999). Influences of workplace conditions on teachers' job satisfaction. *Journal of Educational Research*, 93(1), 39-47.
- Macdonald, D. (1999). Teacher attrition: a review of literature. *Teaching and Teacher Education*, 15(8), 835-848.
- Metz, S. A., & Fleischman, H. L. (1974). *Teacher turnover in public schools: Fall 1968 to fall 1969* Washington D.C.: U.S. Department of Health, Education, and Welfare.
- Miller, D. C., & Byrnes, J. P. (2001). To achieve or not to achieve: A self-regulated perspective on adolescents' academic decision making. *Journal of Educational Psychology*, 93(4), 677.
- Miller, D. M., Brownell, M. T., & Smith, S. W. (1999). Factors that predict teachers staying in, leaving or transferring from the special education. *Exceptional Children*, 65(2), 201-218.
- Mont, D., & Rees, D. I. (1996). The influence of classroom characteristics on high school teacher turnover. *Economic Inquiry*, 34(1), 152-167.
- Murnane, R. J., & Olsen, R. J. (1990). The effects of salaries and opportunity costs on duration in teaching: Evidence from North Carolina. *Journal of Human Resources*, 25(1), 106-124.

- Murnane, R. J., Singer, J. D., & Willett, J. B. (1989). The influences of salaries and opportunity costs on teachers' career choices: Evidence from North Carolina. *Harvard Educational Review, 59*(3), 325-346.
- Murnane, R. J., Singer, J. D., Willett, J. B., Kemple, J. J., & Olsen, R. J. (1991). *Who will teach? Policies that matter*. Cambridge, MA: Harvard University Press.
- NAESP/NASSP/ERS. (2000). *The principal, keystone of a high-achieving school: Attracting and keeping the leaders we need*. Arlington, VA: NAESP/NASSP/ERS.
- National Center for Education Statistics. (2007). *Projections of Education Statistics to 2016* (No. NCES 2008060). Washington, DC: National Center for Education Statistics.
- National Commission on Teaching and America's Future. (2003). *No dream denied: A pledge to America's children*. Washington, DC: National Commission on Teaching and America's Future.
- National Education Association. (2004). *The problem of teacher tenure*. Washington, DC: National Education Association.
- Nelson, F. H., Drown, R., & Gould, J. C. (2002). *Survey & analysis of teacher salary trends 2001*. Washington, DC: American Federation of Teachers, AFL-CIO.
- Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications*. Thousand Oaks, CA: Sage Publications.
- Odden, E., & Wohstetter, P. (1995). Making school-based management work. *Educational Leadership, 52*(5), 32-36.
- Olsen, B., & Anderson, L. (2007). Courses of action: A report on urban teacher career development. *Urban Education, 42*(1).
- Ostroff, C. (1992). The relationship between satisfaction, attitudes, and performance: An organizational Level Analysis. *Journal of Applied Psychology, 77*, 963-974.
- Parent, D. (1999). Wages and mobility: The impact of employer-provided training. *Journal of Labor Economics, 17*(2), 298-317.

- Parsad, B., Lewis, L., & Farris, E. (2001). *Teacher preparation and professional development 2000* (No. NCES 2001-088). Washington, DC: National Center for Educational Statistics.
- Perie, M., & Baker, D. P. (1997). *Job satisfaction among America's teachers: Effects of workplace conditions, background characteristics, and teacher compensation* (Statistical Analysis Report No. NCES 97-471). Washington, DC: National Center for Education Statistics.
- Pisciotta, I. (2000). *Teacher attitudes in Texas public and private schools*: Texas Public Policy Foundation.
- Price, J. L. (2004). The development of a causal model of voluntary turnover. In R. Griffeth & H. Peter (Eds.), *Innovative theory and empirical research on employee turnover*. Greenwich, Connecticut: Information Age Publishing Inc.
- Price, J. L., & Mueller, C. W. (1981). A causal model of turnover for nurses. *Academy of Management Journal*, 24, 543-565.
- Prince, C. D. (2002). *Higher pay in hard-to-staff schools: The case for financial incentives*. Arlington, VA: American Association of School Administrators.
- Robertson, I., T., Smith, M., & Cooper, D. (1992). *Motivation: Strategies, theory and practice*. London: Institute of Personnel Management.
- Rosenholtz, S. J. (1989). *Teachers' workplace: The social organization of schools*. New York: Longman.
- Rosenholtz, S. J., & Simpson, C. (1990). Workplace conditions and the rise and fall of teachers' commitment. *Sociology of Education*, 64, 241-257.
- Rothstein, R. (2002, September 25). Teacher shortages are usually a myth. *New York Times*.
- Rutter, R. A., & Jacobson, J. D. (1986). *Facilitating teacher engagement*. University of Wisconsin, Madison: : National Center on Effective Secondary Schools. ERIC Document Service Reproduction No. Ed 303438.
- Sanders, W. L., & Rivers, J. C. (1996). *Cumulative and residual effects of teachers on future*

*student academic achievement*. Knoxville, Tennessee: University of Tennessee Value-Added Research and Assessment Center.

Schmidt, S. W. (2004). *The relationship between satisfaction with on-the-job training and overall job satisfaction*. Unpublished doctoral dissertation, University of Wisconsin, Milwaukee.

Sentovich, C. (2004). *Teacher satisfaction in public, private, and charter schools: A multi-level analysis*. University of South Florida.

Shen, J. (1997). Teacher retention and attrition in public schools: Evidence from SASS91. *Journal of Educational Research*, 91(2), 81-88.

Shin, H. (1995). Estimating future teacher supply: Any policy implications for educational reform? *International Journal of Educational Reform*, 4(4), 422-433.

Singer, J. D. (1992). Are special educators' career paths special? Results from a 13-year longitudinal study. *Exceptional Children*, 59(3), 262-279.

Smith, T. M., Desimone, L. M., & Ueno, K. (2005). "Highly qualified" to do what? The relationship between NCLB teacher quality and the use of reform-oriented instruction in middle school mathematics. *Educational Evaluation and Policy Analysis*, 27(1), 75-109.

Smith, T. M., & Ingersoll, R. M. (2004). What are the effects of induction and mentoring on beginning teacher turnover? *American Educational Research Journal*, 41(3), 681-714.

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.

Spector, P. E. (1997). *Job satisfaction: Application, assessment, causes, and consequences*. Thousand Oaks, CA: SAGE Publications, Inc.

Stapleton, L. M. (2006). An assessment of practical solutions for structural equation modeling with complex sample data. *Structural Equation Modeling: A Multidisciplinary Journal*, 13(1), 28-58.

- Steel, R. P., & Ovalle, N. K. (1984). A review and meta-analysis of research on the relationship between behavioral intentions and employee turnover. *Journal of Applied Psychology, 69*, 673-686.
- Stinebrickner, T. R. (1999). Using latent variables in dynamic, discrete choice models: The effect of school characteristics on teacher decisions. *Research in Labor Economics, 18*, 141-176.
- Stinebrickner, T. R. (2001). A dynamic model of teacher labor supply. *Journal of Labor Economics, 19*(1), 196-230.
- Stockard, J., & 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.
- Tansky, J. W., & Cohen, D. J. (2001). The relationship between organizational support, employee development, and organizational commitment: An empirical study. *Human Resource Development Quarterly, 12*(3), 285-300.
- Theobald, N. D. (1990). An examination of the influence of personal, professional, and school district characteristics on public school teacher retention. *Economics of Education Review, 9*(3), 241-250.
- Tomarken, A., & Waller, N. G. (2005). Structural equation modeling: Strengths, limitations, and misconceptions. *Annual Review of Clinical Psychology, 1*, 31-65.
- Trevor, C. O. (2001). Interactive effects among actual ease of movement determinants and job satisfaction in the prediction of voluntary turnover. *Academy of Management Journal, 44*, 621-638.
- van Breukelen, W., van der Vlist, R., & Steensma, H. (2004). Voluntary employee turnover: Combining variables from the 'traditional' turnover literature with the theory of planned behavior. *Journal of Organizational Behavior, 25*, 893-914.
- Vandenberg, R. J., & Nelson, J. B. (1999). Disaggregating the motives underlying turnover intentions: When do intentions predict turnover behavior? *Human Relations, 52*(10), 1313-1336.

- Veum, J. R. (1997). Training and job mobility among young workers in the United States. *Journal of Population Economics*, 10(2), 219-233.
- Weiss, E. M. (1999). Perceived workplace conditions and first-year teachers' morale, career choice commitment, and planned retention: A secondary analysis. *Teaching and Teacher Education*, 15(8), 861-879.
- Wideen, M., Mayer-Smith, J., & Moon, B. (1998). A critical analysis of the research on learning to teach: Making the case for an ecological perspective on inquiry. *Review of Educational Research*, 68(2), 130-178.
- Wong, H., & Asquith, C. (2002). Supporting new teachers. *American School Board Journal*, 189(26), 22-24.

## **BIOGRAPHICAL SKETCH**

Sung-Hyun Cha received a Bachelor's and Master's degree from the Department of Education at Seoul National University in Seoul, Korea. Anthropology of education was the major for his Master's studies. Prior to pursuing a doctoral degree, he worked for three years at the Office of Evaluation on Educational Institutions, the Korean Educational Development Institute (KEDI), arguably the country's most prominent educational research center. In his capacity there, he conducted evaluations of K-12 public schools, teacher education institutes.

He began his doctoral work at Educational Leadership and Policy Studies, Florida State University with support from the College Teaching Fellowship. During doctoral study, he focused his coursework around U.S. and international education policy, economics of education, and quantitative and qualitative research methods. Since his enrollment at FSU, he worked as a service learning coordinator for EDF 1005 Introduction to Education for one year and taught the course three times. Through these coordinating/teaching experiences, he has developed a solid understanding of the U.S. K-12 education system and reforms.

Along with a great interest in teacher quality and teacher education, he built extensive knowledge of data management and analysis through extensive statistical training, dissertation study, and research projects. His dissertation project entitled "Explaining teacher's job satisfaction, intent to leave, and actual teacher turnover: A structural equation modeling approach" was supported by a grant from the American Educational Research Association. He fine-tuned his skills in data management and analysis with large-scale U.S. survey data with complex sampling designs and longitudinal data through dissertation study and the works with several members of the FSU faculty.