

TEACHER ATTRITION AMONG EARLY CAREER SPECIAL AND GENERAL
EDUCATORS: AN EXAMINATION OF DEMOGRAPHIC AND EMPLOYMENT
RELATED RISK FACTORS

by

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The purpose of this study was to examine the influence that select demographic and employment factors have on the risk of attrition for beginning special and general educators. Data for this study came from the University of Oregon College of Education Student Follow-up Survey project. Employment outcomes were assessed at 1, 3, and 5-year intervals for a sample of early career special and general educators via a mailed survey. Cox regression analysis was used to estimate the risk of attrition during the study period. The findings suggest that overall special and general educators had low a risk of attrition, but risk varied by demographic and employment characteristics. Implications for practice and research are discussed.

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CHAPTER I

INTRODUCTION

Teacher attrition is a serious problem facing our nation's public schools. Every year large numbers of promising educators enter the classroom and then leave within a few years, something that is called "attrition."¹ This "revolving-door" of trained educators leaving the public schools saddles both schools and communities with costs that significantly, and negatively, impact budgets, and also affects student achievement (Ingersoll, 2001).

Nationally, teacher attrition costs taxpayers approximately \$2.2 billion per-year in terms of the resources that are required to replace teachers who have left their positions (Alliance for Excellent Education, 2005). The costs that attrition imposes on states range from \$19.3 million per-year in Oregon to over \$200 million in states such as California and Texas (Alliance for Excellent Education, 2005). In addition to the substantial costs of re-staffing classrooms, teacher attrition contributes to a decrease in effective instruction and student achievement (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2008).

The impact that teacher attrition has on student learning gains is of concern since academic and social outcomes are determined, at least to a certain extent, by the instruction that students receive in classrooms (Greenberg et al., 2003; Rivkin et al., 2005). Evidence suggests that there is a strong association between teacher attrition and

¹ Teachers are considered to be in the early stages of their career during the first five years following professional preparation (Murnane, Singer, Willett, Kemple, & Olsen, 1991; Singer, 1993). Teacher attrition is classically defined as the act of leaving the teaching profession (Edgar & Pair, 2005); I use this definition in this study.

student achievement (Boyd et al., 2008); specifically, short spells of initial teaching employment adversely affect student achievement (Boyd et al., 2008; Hanushek, Kain, O'Brien, & Rivkin, 2005). Stated otherwise, students who attend schools in which teacher attrition is high are more likely to receive instruction from inexperienced and, usually, less effective teachers (Rivkin, Hanushek, & Kain 2005). Additionally, staffing instability caused by teacher attrition can contribute to a lack of coherent instruction across schools and districts (Boyd et al., 2008; Loeb, Darling-Hammond, & Luczak, 2005).

In addition to the detrimental effects of teacher attrition on states, districts, and students, students with disabilities may be uniquely impacted (Billingsley, 2004). Furthermore current estimates suggest that nearly 25% of all new teachers leave the profession within the first three years of practice (U.S. Department of Education, 2007), an issue that is of particular concern because both special and general educators share the responsibility for providing support for students with disabilities (Hines, 2001; Hunt, 2000; Kochhar, West, & Taymans, 2000). In the absence of a stable teaching work force the quality of education provided for students with disabilities has the potential to be undermined.

Given the important implications that teacher attrition has for student achievement and school spending, especially for students with disabilities served through special education, it is critical to examine the factors that contribute to attrition. The purpose of this dissertation study is to investigate the extent to which selected teacher demographic characteristics and specific employment related factors are associated with the risk of a sample of general and special educators leaving the educational field during their first

five years of career engagement. Specifically, this study uses the University of Oregon's College of Education Student Follow-up Survey (SFS) data set (Bullis, Mahoney, & Naranjo, 2007), which reflects the employment outcomes of recent College of Education graduates. Moreover, this study will compare the employment outcomes of special education and general education graduates represented in that data set. Thus, the purpose of this study is to examine the influence that select demographic and employment factors have on the risk of leaving the classroom for beginning educators.

Conceptual Model

This study is grounded in Billingsley's (1993) conceptual model of the influences of teachers' career decisions (Figure 1). Billingsley's schema suggests possible relationships that exist among three major factors: (a) external, (b) employment, and (c) personal. External factors include economic, societal, and institutional considerations. These factors are hypothesized to both directly and indirectly influence teachers' career decisions through interactions with employment and personal factors (Billingsley, 1993). Employment factors comprise a central piece of the model and include professional qualifications, work conditions and work rewards, commitment, and employability. Employment factors and their component pieces are hypothesized to have primary and indirect effects on teachers' career decisions (Billingsley, 1993).

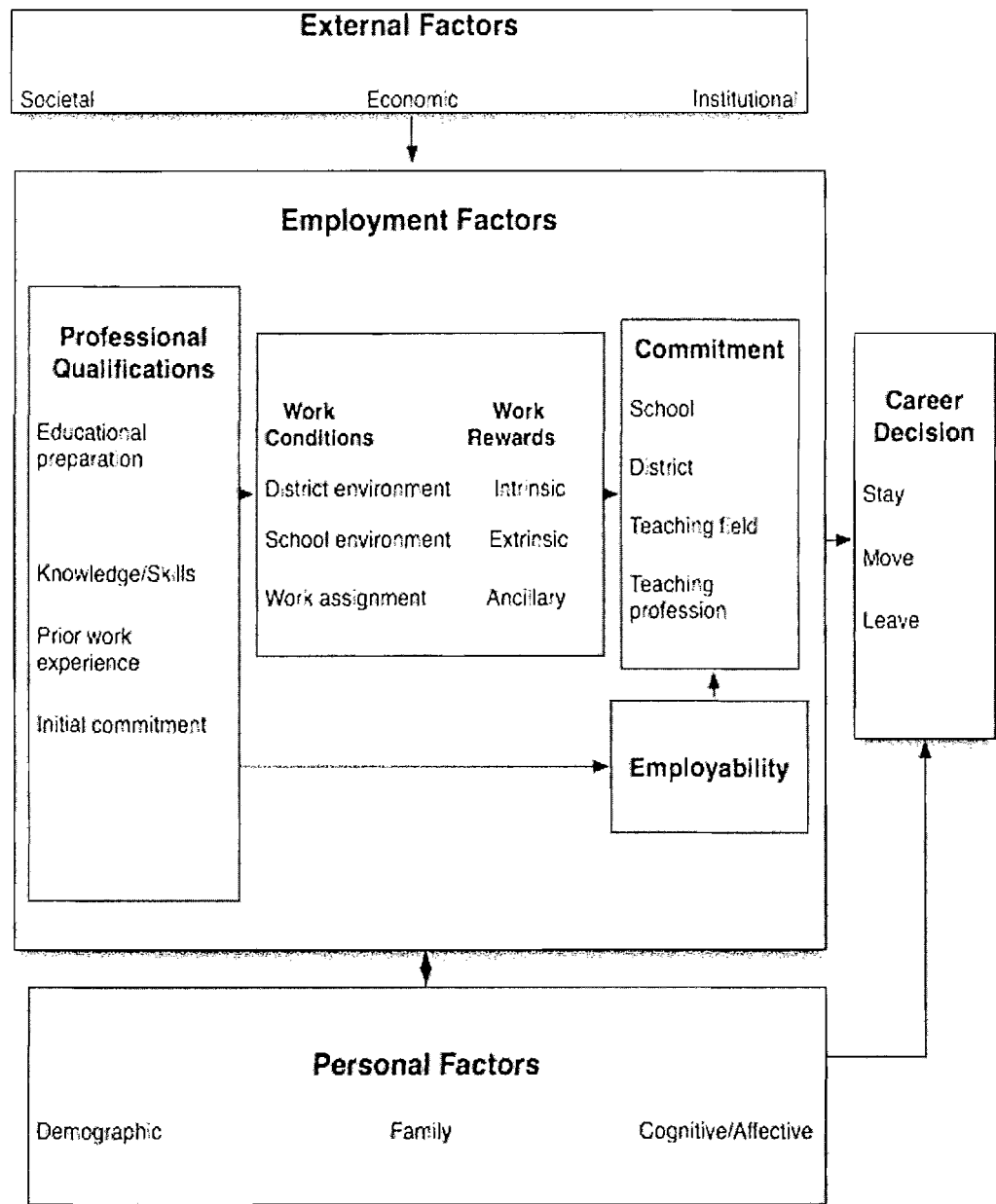


Figure 1. Billingsley's (1993) Model of the Influences of Teachers' Career Decisions

Professional qualifications include teachers' professional preparation and past employment experiences. Work conditions include the social and physical environments created by school districts, schools, and classrooms. The model suggests that if well

prepared teachers are working under conditions that are perceived to be favorable then they will be more likely to remain in their positions. Work rewards are the benefits derived from engaging in the work of teaching. The model defines work rewards as intrinsic, extrinsic, and ancillary. Intrinsic rewards are those benefits that come from the psychological satisfaction derived from teaching. Extrinsic rewards come in the form of salaries and compensation packages. Ancillary rewards are the benefits that support the work done by teachers and include extended vacation periods and family friendly work schedules. Taken together, the model proposes that if there is alignment between professional qualifications, favorable working conditions, and sufficient work rewards teachers will likely be committed to their chosen profession (Billingsley, 1993).

Personal factors comprise variables such as teacher demographic characteristics, family composition, and cognitive and affective states. These variables can both directly and indirectly influence career decision-making. For example, a recently prepared teacher may decide to take time away from teaching to give birth and then to parent full-time. This decision to leave teaching is hypothesized to be the primary effect of the individual's gender and family status (Billingsley, 1993). Additionally, a teacher's ethnicity figures prominently in the career decision-making process (McLeskey, Tyler, & Flippin, 2004). Due to societal barriers to career development a teacher may choose to leave the profession or move to a different school or district. Finally, cognitive/affective reactions to work may have an influence on career choice (Billingsley, 1993). If a teacher feels highly satisfied with her job she is likely to continue doing the work for years to come. On the other hand, if the work becomes overly burdensome or emotionally draining the individual may choose to quit. Personal factors play a prominent role in

teachers' career decisions and function both independently and in concert with other factors in the process of career choice.

The primary outcome identified in the model is "career decision." Teachers' career decisions include three distinct choices: stay, move, or leave. If a teacher makes the decision to *stay*, this means that they remain in their current teaching position. Teachers who make the decision to *move* relocate to a different teaching position. A significant source of attrition in the teaching workforce comes from teachers' decisions to *leave* teaching. Leaving is the act of separation from the teaching profession (Billingsley, 1993). The model indicates that teachers leave the profession for a host of personal, social, economic, and employment related reasons (Billingsley, 1993). Arguably, some teachers who leave the profession are better suited for jobs elsewhere in education or in other sectors of the economy. Although some of this type of loss is acceptable, and in some cases preferable as teachers who are dissatisfied and/or ineffective are selected out of education, the field sheds far too many classroom teachers prematurely (Billingsley, 2004; Ingersoll, 2001; McLeskey et al., 2004; Singer, 1993).

Billingsley's (1993) model of the influences of teachers' career decisions is one of several referred to in the professional literature on educator attrition; but it is the only model best suited to this study for two reasons (Brownell & Smith, 1992; Chapman, 1983; Ingersoll, 2001). First, it includes the influences that teacher demographic characteristics and employment factors have on decisions to leave teaching. Second, this model is designed to explain the factors that influence the career decisions of both special and general educators.

The current study focuses on the career path of those leaving the teaching profession with specific attention paid to those teachers that exit early in their careers. In line with that purpose, Billingsley's (1993) model suggests that individual variables act as robust influences in the process of career decision-making regarding career choices. Specific variables (e.g. employment and personal) can exert considerable influence on teachers' decisions to leave the classroom. Given the nature of hypothesized influence that employment and personal variables have on teachers' career decisions it is conceptually and analytically appropriate to examine specific demographic and employment variables that may impact teachers' career decisions; this study examines the direct effects that key demographic variables have on teachers' decisions to leave the teaching profession. This study also investigates the association that specific employment variables have on teacher attrition. Specifically, this study examines four explanatory variables that are described within Billingsley's (1993) schema as variables that influence teachers' decision to leave teaching: (a) gender, (b) ethnicity, (c) teacher type (special or general education), and (d) teacher grade level (elementary or middle and secondary). The next chapter reviews the literature related to the factors that influence teacher attrition in accordance with Billingsley's (1993) conceptual model.

Review of Related Literature

This review includes four sections. The first section provides a brief description of the methods that were used to identify and select studies on the topic of teacher attrition. Next, studies related to the external, employment, and personal influences of teachers' career decisions are reviewed and discussed. The third section summarizes the

findings from the literature and the fourth section includes the specific research questions that will guide this study.

Methods for Literature Review

Prior research related to teacher attrition in special and general education was gathered through a search of major electronic databases (ERIC, PsychInfo, and Google Scholar) using the following keywords: teacher characteristics, teacher attrition, special education, and general education. In addition, an “ancestral search” of related studies was conducted using the reference section of the identified publications. That is, I referred to the citations cited in pertinent publications and then located those cited publications. In both cases the following search parameters were utilized: (a) peer-reviewed journal articles, (b) technical reports, (c) dissertations, and (d) date range 1990 to 2008.

This expansive search process produced 153 publications that formed the initial literature pool for this review. To cull this pool further, I adopted three criteria for publications to be retained for review: (a) data were reported on teacher attrition, (b) the study was conducted using participants in the United States, and (c) the study reported on teacher demographic characteristics and employment related data. Publications were retained if they met two of these three criteria. A total of 67 publications from the initial literature pool were eliminated, leaving 86 publications for review.

I obtained copies of all 86 remaining publications. I then conducted a careful review of the each publication using the inclusion criteria stated above and reduced the number in the final literature pool that I reviewed for this dissertation to 41. Generally, publications were eliminated because they did not meet all three of the established

inclusion criteria. I next discuss the process I followed to review and analyze these 41 studies².

To ensure that a high level of rigor was maintained for this review, all publications were reviewed three times. Throughout this process, I identified the following thematic constructs that contribute to teachers' career decisions: (a) external, (b) employment, and (c) personal factors, which are aligned directly with Billingsley's conceptual model which I described earlier.

I first organized the findings from each publication by external, employment, and personal factors. For example, in each publication, I identified all data reported on external factors that influence teachers' decisions to leave the classroom. I repeated this process for the employment and personal factors until I had documented all of the variables associated with teacher attrition. To ensure that I had reliably documented these variables I repeated the process a second time. The section that follows reports the findings from this process and is organized by specific constructs identified in Billingsley's conceptual model of the influences of teachers' career decisions.

A Review of Research Related to External, Employment, and Personal Factors

External Factors

External factors that influence teachers' career decisions include economic, societal, and institutional factors. These factors function independent of teachers and their employers to establish the macro-environmental context for career decision-making (Billingsley, 1993; Brownell & Smith, 1993). It is hypothesized that if the perceived

² The 41 studies are listed in Appendix A.

environmental context is favorable then individuals will persist in their positions as classroom teachers.

Economic factors. Trends in the U.S. economy have a direct impact on labor markets. When the economy expands workers have a variety of employment opportunities to choose from. Under these circumstances, if a worker finds her job to be unsatisfactory she can seek employment elsewhere to improve her condition. In contrast, when the economy contracts employment opportunities dwindle. Under these conditions workers are more likely to stay in their positions because opportunities elsewhere in the labor market do not readily exist.

The wage structure for teachers is quite stable and predictable overtime so it follows that given their level of education and time spent on the job, teachers' have a high level of certainty regarding wage expectations (Stinebrickner, 2001). Thus, the teaching profession provides consistent employment with stable wages in economic times of both plenty and want. It is reasonable to expect that some teachers will seek employment outside of the teaching profession given the opportunity to improve their earnings (Imazeki, 2005). However, I found no studies that documented an association between trends in U.S. economy and trends in the teacher labor market.

Societal factors. The wealth, racial composition, and geographic location of communities establish the social context in which schools are situated (Evans, 2004). For example, there is a strong degree of consistency among studies of teacher attrition that suggest that the characteristics of children and communities influence teachers' decisions to leave the classroom. The studies conducted by Shen (1997) and Williams (2004) measured school poverty by student receipt of free or reduced-price lunch. Over the past

fifteen-years numerous studies have determined that the presence of large proportions of impoverished students in schools is associated with increased rates of teacher attrition (Gritz & Theobald, 1996; Hanushek, Kain & Rivkin, 2004; Lukens, Lyter & Fox, 1999; Smith & Ingersoll, 2004).

Williams (2004) used data from the North Carolina public school system and found that in a sample of 37,642 special educators, individuals made decisions to leave their positions based on the socioeconomic characteristics of students. Special educators working in high-poverty schools were more likely to leave than those working in affluent settings (Williams, 2004).

Using data from the Schools and Staffing Survey and the Teacher Follow-Up Survey³ between 1990 and 1992, Shen (1997) found that teachers working in schools with higher percentages of students who received free or reduced lunch were more likely to leave than teachers working in schools with lower percentages of students who received similar meal benefits.

In a study relating student racial composition in Texas public schools to teacher attrition Hanushek et al. (2004) found that teachers made decisions to leave their positions based on the racial characteristics of students. Analyzing a sample of nearly 400,000 teachers, Hanushek et al. (2004) determined that white teachers were more likely to leave schools that had large numbers of students of color. Conversely, the opposite was

³ The *Schools and Staffing Survey* and the *Teacher Follow-Up Survey* are conducted annually by the National Center for Education Statistics to determine the characteristics of schools, teachers, students and administrators in the U.S. The surveys are also designed to measure labor market demand and teacher attrition (National Center for Education Statistics, 2009).

found for teachers of color, in that these individuals tended to stay in schools with large proportions of students of similar racial backgrounds to their own.

Examining data collected on the population of New York public elementary school teachers with five or fewer years of experience, Boyd, Lankford, Lobe and Wyckoff (2005b) found that White and Hispanic teachers were more likely to leave their positions as the number of white students decreased and the number of black students increased. In a study of 9,756 white teachers in the state of Washington, Gritz and Theobald (1996) found that teachers were less likely to stay working in school districts that enrolled large proportions of both students of color and students who were poor. Imazeki (2005) used longitudinal data from the Wisconsin Department of Public Instruction that documented teachers' career paths between 1992 and 1998. She found that men were 2.6 times more likely to leave the teaching profession than women as the proportion of non-white students in a school district increased. In a study of 1,071 teachers in California, Lobe, Darling-Hammond and Luczak (2005) found that the risk of attrition was nearly three times greater for teachers who worked in schools where the student population was majority Black or Hispanic as compared to teachers that worked with lower proportions of students of color.

Shen (1997), in her study of national level teacher follow-up data, found that teachers were more likely to leave teaching if they worked in schools with large numbers of students of color. Marvel, Lyter, Peltola, Strizek and Morton (2007) analyzed national Teacher Follow-up survey data from 2004-2005 and found that schools that enrolled 35% or more of students of color had the highest rates of teachers leaving the profession. In another study, using 2000-2001 Teacher Follow-up data, Lukens, Lyter and Fox (2004)

found that schools with enrollments of students of color that exceed 35% had the highest rates of teacher attrition. Kirby, Berends, and Naftel (1999) note that economically disadvantaged school districts are predominately staffed by teachers of color. Many economically disadvantage school districts are populated by students of color and are located in urban areas (Darling-Hammond & Sclan, 1996).

Using national level data Jacob (2007) found that 31% of urban school districts in the U.S. had difficulties staffing special education teaching positions compared to 26% of suburban school districts. Lankford, Loeb, and Wyckoff (2002) found that teacher turnover tended to be the highest in densely populated urban areas. For example, only 28% of New York City teachers remained in the same school for a five-year period compared to 46% of teachers working in suburban schools (Lankford et al., 2002). In their study of elementary school teachers between 1995 and 2004, Boyd et al. (2005b) found that urban teachers who had originally resided outside of urban areas prior to becoming teachers were 68% more likely to leave the classroom than teachers who had originally resided in urban areas prior to entering the teaching profession.

Rural areas also experience staffing problems associated with teacher attrition. In a comparison of national panel data from the Schools and Staffing Survey and the Teacher Follow-Up Survey (1993-1995) and a 1998-1999 survey from one western state, Stockard and Lehman (2004) found that beginning teachers working in rural areas had higher levels of attrition than teachers working in suburban settings.

Institutional factors. Federal, state and local policies that govern the educational system may impact teachers' career decisions. For example, special educators must comply with federal and state policies pertaining to the writing and maintenance of

student individualized education program (IEP's). There have been several studies that have cited "excessive paper" work as a contributing factor to special educators decisions to leave the profession (Paperwork in Special Education, 2009; Schnorr, 1995; Westling & Whitten, 1996); yet it is difficult to discern if the policies themselves are problematic or if other factors confound these findings.

It has been argued that policies that emphasize the production of high student test scores lead to undesirable employment conditions and cause teachers to leave the classroom (Jones, Jones, & Hargrove, 2003). Contrary to this argument, Boyd, Lankford, Lobe and Wyckoff (2005a) in their study of 359,962 elementary teachers in New York found that attrition rates decreased by 18% after the implementation of state mandated testing at the fourth-grade level. In addition, Boyd et al. (2005a) found that there was a 25% decrease in attrition for first year teachers after the implementation of testing reforms.

Employment Factors

Billingsley's (1993) conceptual model places a strong emphasis on employment factors, suggesting that professional qualifications, work conditions and work rewards, commitment, and employability influence teachers' career decisions. Researchers studying teacher attrition have focused much of their attention on addressing employment related factors because many of these factors can be targeted for intervention (Billingsley, 2004; Billingsley, 1993).

Professional qualifications. In general, the early career paths of special and general educators follow similar patterns (Singer, 1993) as some research suggests that both groups of teachers are likely to leave their positions shortly after they begin their

teaching careers (Grissmer & Kirby, 1987; Singer, 1993; Theobald, 1990). Several studies, however, have reported that special educators have higher rates of attrition than general educators (Boe, Cook, & Sunderland, 2008; Imazeki, 2005; Ingersoll, 2001), but few studies have examined which of these groups remains in the educational field longer.

In a 13-year longitudinal study of 6,642 teachers from Michigan and North Carolina, Singer (1993) found that special and general educators had different employment durations depending on the state in which they worked. Special educators from Michigan had median employment durations of 6.6 years and in North Carolina the median duration was 6.3 years. General educators from Michigan had median employment durations of 4.3 years and 11.3 years in North Carolina.

Boe, Cook, and Sunderland (2008), in their analysis of trends in teacher attrition using Schools and Staffing Survey and Teacher Follow-up Survey data from 1990 through 2001, found that special educators left the profession at a slightly higher rate than general educators (30% versus 28%) over that 11-year time period. In an earlier study of a nationally representative sample of 4,798 special and general educators between 1987 and 1989, Boe, Bobbitt, and Cook (1997) found that special educators had a higher rate of attrition (8%) than general educators (6%).

Ingersoll (2001) in a study of 6,733 teachers found that the odds of turnover for special educators were 32% higher than those of general educators. Marvel et al. (2007), using data on more than 7,000 teachers, found that special educators left the educational field at the highest rate, 10%, compared to mathematics (7%), science (6%), social studies teachers (8%),.. Analyzing follow-up survey data on 161 graduates from a special education teacher preparation program in Washington, Edgar and Pair (2005) found that

70% of teachers were still working in the classroom at the end of a six-year follow-up period.

Certification status has also been found to be associated with teachers' career decisions. In a nationally representative sample of teachers derived from the 1989 Teacher Follow-Up Survey, Boe, Bobbitt, Cook, Whitener, and Webber (1997) reported that special and general educators who were fully certified were more likely to remain in their positions (87%) compared to those who were not fully certified (81%). Using data from a survey of 1,576 Florida special educators, Miller, Brownell, and Smith (1999) found that teachers' decisions to leave the classroom were related to teachers' rates of certification: certified teachers had a higher likelihood of staying in their jobs (88%) than teachers who were not certified (79%).

Adams (1996), in a study of 2,327 beginning elementary school teachers in Texas, found that traditionally certified teachers were 19% more likely to leave the educational field than were alternatively certified teachers. Although different from the findings of Boe et al. (1997) and Miller et al. (1999), Adams' findings are consistent with the notion that individuals who are more rigorously prepared may have expanded employment opportunities and therefore may be more likely to leave their positions (Darling-Hammond & Sclan, 1996).

Two qualitative investigations confirmed the statistical findings of Boe et al. (1997) and Miller et al. (1999). Using in depth interview data from 93 former teachers in Florida, Brownell, Smith, McNellis and Miller (1997) found that special educators who left the profession lacked full teaching certification. Brownell, Smith, McNellis and Lenk

(1994-1995), in their interviews with 24 special educators, found that 73% of teachers who remained in their positions had full certification.

Academic ability has been consistently associated with teachers' decision to leave the classroom. Teachers' academic ability has typically been measured by performance on standardized tests such as the National Teachers Examination (NTE) and college entrance examinations (Murnane, Singer & Willett, 1989; Podgursky, Monroe & Watson, 2004; Singer, 1993). In her longitudinal study of teachers in Michigan and North Carolina, Singer (1993) found that special educators with high NTE scores were two times more likely to leave teaching when compared to their lower scoring peers.

Consistent with Singer's findings, Henke, Chen, Geis, and Kenpper (2000) found that teachers with test scores on their college entrance exams that were in the top 25% were twice as likely to leave teaching in the first 4 years than those who scored in the bottom 25%. Boyd et al. (2005b) reported that retention of first-year teachers in New York with certification examination scores in the top quartile fell by 4% from 81% to 77% when teachers worked with low-achieving students.

Murnane, Singer, Willett, Kemple, and Olsen (1991) reported on longitudinal data from North Carolina, on a sample of 16,579 teachers over a 13-year time period and found that individuals who scored in the 90th percentile on the NTE were the least likely to remain in the classroom longer than five years. In their study of 3,963 beginning public school teachers in Missouri between 1989-1990 and 2000-2001, Podgursky et al. (2004) found that individuals with high-composite college entrance examination scores were less likely to remain in the classroom after four years of teaching than their lower scoring peers.

Darling-Hammond and Sclan (1996) point out that the scores of the NET are highly correlated with other "...standardized tests used to screen applicants for entry into other relatively high-paid fields" (p. 83). Therefore individuals with high-standardized test scores may have expanded opportunities outside of classroom teaching and are more likely to leave than their peers who received lower scores.

Work conditions. The school environments that teachers work in are hypothesized to influence career decisions. Research related to teachers' work environments has focused on variables associated with school climate, perceived support, work assignments, and salaries.

Using data from a survey of special educators in Florida, Miller et al. (1999) found that teacher perceptions of school climate were predictive of attrition. Miller et al. defined *school climate* as a rating of teaching staff morale. Teachers who perceived school climate positively were more likely to stay in their positions than those who perceived school climate negatively. Lobe et al. (2005), in their study of teacher turnover in California, found that the odds of turnover for teachers who perceived school conditions negatively were 46% higher than the odds of those with positive perceptions. In the Lobe et al. (2005) study school condition was defined as a composite variable and included teacher perceptions of the physical attributes of schools, the quality of professional development, the involvement of parents, and perceptions related to the administration of standardized tests.

Aside from the work of Miller et al. (1999) and Lobe et al (2005), I found no other studies linking teachers' perceptions of school climate to attrition. There were, however, a number of studies that document teachers' *intent* to leave based on

perceptions of the quality of work environments (A High Quality Teacher for Every Classroom, 2009; Billingsley, Carlson & Klein 2004). These studies typically found that teachers who viewed their work environments positively expressed a strong intent to remain in their positions but the opposite was found for teachers with negative perceptions (Billingsley, Carlson, & Klein 2004). Given that these studies focused solely on teacher intentions and did not investigate the manifestation of intentions in actual behavior, any assumption about the relationship between teachers' intentions and career behaviors remains equivocal.

The presence of dedicated administrative support for both special and general educators appears to be a salient factor in determining if teachers will remain in the classroom. Miller et al. (1999) asked special educators if building administrators supported their teaching practice and their needs. Those who stayed in their positions indicated that strong administrative support was a determining factor in their decision to remain in the classroom. Reporting on national level survey data, Ingersoll (2001) found that after controlling for the characteristics of both teachers and schools the odds of leaving the classroom for teachers who did not feel supported by administrators were 9.5% higher than the odds of those who felt supported. In a qualitative longitudinal interview study of 50 new teachers in Massachusetts, Johnson and Brikeland (2003) reported that teachers were more likely to "settle into" and stay in teaching positions that were supported by school administrators who arranged schedules that accommodated for collegial interaction and collaboration time.

Interviews conducted by Brownell et al. (1994-1995) and Brownell et al. (1997) with special educators revealed that teachers who left the classroom felt exceedingly

frustrated with the diminished level of support they received from building administrators. In a qualitative study involving 17 urban special educators who had left teaching, Morvant, Gersten, Gillman, Keating, and Blake (1995) found that disaffected teachers were frustrated with the lack of communication and support from administrators. Plat and Olson (1990) reported that 43% of special educators who left teaching did so due to stress that they believed was produced by poor administrative support and excessive paperwork. In her study of the factors that influence teacher attrition, Shen (1997) found that a decrease in attrition was associated with increased levels of administrative support.

The literature reviewed suggests that collegial support is vital to the success of beginning educators. In order to be successful in their practice, teachers need to be adequately supported and mentored by their colleagues (Cochran-Smith, Feiman-Nemser, McIntyre, & Demers, 2008; Darling-Hammond & Sclan, 1996; Whitaker, 2000). Examining national data from 1999 to 2000 on 3,235 first-year teachers, Smith and Ingersoll (2004) found that mentoring by teachers from the same field as beginning teachers reduced the risk of leaving by 30%. Smith and Ingersoll (2004) also determined that having common planning time and opportunities for collaboration reduced the risk of leaving for new teachers by 43%. Qualitative research confirms these statistical findings and indicates that teachers who feel supported and nurtured in collaborative relationships with colleagues are less likely to leave their positions (Johnson & Brikeland, 2005; Morvant et al., 1995).

Work assignment. There were a number of studies that address the relationship between work assignments and teacher attrition. Mont and Rees (1996), in a sample of 525 newly hired teachers from New York, reported that decreasing the number of classes

taught inside a teacher's main certification area by 10% increased the risk of attrition by 3%. Concerning special educators, Singer (1993) found that teachers working at the elementary level remained in the classroom an average of 1.6 years longer than those working at the secondary level. Singer (1993) reported that the risk of leaving teaching for special educators at the secondary level is the greatest during the first year of practice.

Consistent with Billingsley's (1993) model the literature reviewed indicates that teacher grade level is an important factor in determining teachers' decisions to leave the profession. In their study of Teacher Follow Up survey data from 1999-2000 to 2000-2001, Lukens et al. (2004) found that teachers working at the secondary level left teaching at a higher rate than those working at the elementary level (6.8% versus 8.6%). Analyzing an earlier Teacher Follow-Up survey data set, Whitener et al. (1997) reported results consistent with those of Lukens et al. (2004) such that secondary teachers left teaching at a higher rate than elementary teachers (5.5% versus 4.8%). Results from the most recent analysis of Teacher Follow-Up survey data by Marvel et al. (2007) suggest that teachers at the secondary level leave the classroom at a higher rate than elementary teachers (8.5% versus 8.6%).

Theobald (1990), using personnel data on more than 37,000 teachers in Washington, found that working at the elementary level was positively associated with the decision to stay in the classroom among women. In their longitudinal study of teachers' employment durations in Michigan and North Carolina, Murnane et al. (1991) found that on average elementary teachers stayed in their positions three years longer than secondary teachers.

In summary, there is agreement among the studies reviewed that teachers working in their primary area of certification and those working at the elementary level are the least likely to leave the classroom. The findings related to teacher grade level are consistent with the contention that teachers working at the secondary level often have specialty training in content areas outside of education and therefore can access employment opportunities in other sectors of the economy more readily than those lacking such training (Darling-Hammond & Sclan, 1996; Murnane, Singer, & Willett, 1989). It should be noted that none of the studies related to work assignments examined the interaction between teachers' preparation as special or general educators and grade level work assignment.

Work rewards. Work rewards are the benefits derived from engaging in the work of teaching. It has been suggested that if work rewards are perceived to be sufficient, teachers will likely stay in their positions for an extended period of time (Billingsley, 1993). Of the 41 articles included in this review 16 addressed the relationship between teacher salaries and attrition. Not surprisingly, all of the research findings concur that teachers who are paid more have lower rates of attrition than those who are paid less for doing comparable work. For example, in a national study of teacher attrition Marvel et al. (2007) found that teachers earning less than \$30,000 per-year left teaching at a higher rate (10.6%) than those earning \$30,000–\$39,000 (7.2%) or those earning in excess of \$40,000 (8.7%). This positive relationship held across the reviewed studies regardless of teachers' geographic location, preparation (special or general education), gender, ethnicity, school conditions, or work assignment. I found no studies that examined the

relationship between the non-monetary rewards related to teaching (i.e. the intrinsic psychological satisfaction derived from teaching) and the risk of leaving the classroom.

Commitment and employability. Two qualitative studies were identified that linked teachers' career decisions to commitment. In their interviews with urban special educators in the Southeast, Brownell et al. (1994) found that those who stayed in the classroom were more committed to working with students with disabilities than those who left. Johnson and Birkeland (2003) using qualitative longitudinal interview data from newly hired teachers found that those who were committed to their practice were likely to stay in their positions when compared to those less committed. Commitment was defined as a feeling of dedication to the teaching profession and to students.

Billingsley et al. (1995), using data from a survey of public school teachers in Memphis, Tennessee, reported that 46% of teachers were not committed to remaining in the classroom because they wanted to pursue other employment, educational, and familial opportunities. Billingsley et al. did not follow-up with survey respondents to determine if commitment manifested itself in actual behavior. In their longitudinal study of commitment to the teaching profession among 551 newly prepared teachers, Marso and Page (1997) found that 60% of individuals who were certain about their decision to become teachers at the time of commencement were employed seven years later.

Employability is suggested to result from teachers possessing the necessary professional qualifications (e.g. preparation, certification, knowledge/skills, and initial commitment) to enter into classroom teaching (Billingsley, 1993). Once employed, any number of external, employment, or personal factors can influence teachers' commitment to their chosen profession and determine how long they remain in the classroom

(Billingsley, 1993). I found no studies that examined the relationship between employability and commitment.

Personal Factors

There is a relatively extensive research literature base related to the influence of personal factors on teachers' career decisions. Although these underlying teacher characteristics are not amendable to intervention, understanding how these variables function in relation to teachers' career decisions is important because such information could be potentially used to support teacher persistence.

Age. Age has been linked consistently to teachers' decisions to leave the classroom. Several researchers have noted that teacher attrition follows a U-shaped pattern with age, such that young teachers and those nearing retirement age are the most likely to leave (Grissmer & Kirby, 1987; Ingersoll, 2001; Murnane et al., 1991; Whitener et al., 1997; Williams, 2004). Lukens et al. (2004) reported that the national attrition rate for teachers under 30 years old (9.6%) and those 50 years or older (9.8%) were nearly equal. Whereas attrition rates among teachers between the ages of 40-49 (4.6%) is approximately half as large.

Related, age and experience are highly correlated (Billingsley, 2004; Grissmer & Kirby, 1987; Marvel et al., 2007). Teachers who are young are typically inexperienced and may leave the classroom because they do not have a great deal invested in their careers allowing for a high degree of mobility in the labor market (Adams, 1996; Murnane et al., 1989) and experienced teachers tend to be older and more settled in their careers (Marvel et al. 2007; Whitener et al. 1997). These older individuals have a tendency to age out of the public school system over time as they become eligible for

retirement (Kirby et al., 1999; Lukens et al., 2004; Texas Teacher Retention Mobility and Attrition, 1995).

None of the studies included in this review suggested that either age or experience impacted the career decisions of special and general education teachers differently (Boe et al. 1997; Singer, 1993).

Gender. The teaching work force in the United States is overwhelmingly comprised of women (Strizek, Pittsonberger, Riordan, Lyter, & Orlofsky, 2007). A recent estimate by the U.S. Census Bureau (2004) found that 87% of special educators and 79% of general educators were women. Investigations that have examined gender as a single predictor of teachers' decisions to leave teaching have typically found that women are more likely to leave than men (Billingsley et al., 1995; Johnson & Birkeland, 2003; Marvel et al. 2007; Whitener et al., 1997). In a study of more than 2,000 teachers, Adams (1996) found that women were 37% more likely to leave that classroom than men. Billingsley et al. (1995), in their three-year study of urban teachers in the Southeast, found that approximately 80% of all teachers who left the classroom were women. In a recent analysis of a nationally representative sample of 7,429 teachers, Marvel et al. (2007) reported that women (8.6%) had a higher rate of attrition than men (7.7%). Ingersoll (2001) found that the odds of staying in the classroom were 7% higher for men than the odds of staying for women.

When age is considered, its interaction with gender reveals a more complex association. Using teacher data to estimate employment durations, Murnane et al. (1991) found that only 50% of women under age 30 remained in the classroom longer than five years. In a similar examination Singer (1993) reported that young women (i.e. those

under 30) were at a greater risk of leaving than young men. These findings suggest that higher attrition rates among young women may be related to life-cycle events such as the birth of child (Stinebrickner, 2002).

I identified two studies that documented that there were no differences in the attrition rates of women and men. In an analysis of Teacher Follow-Up survey data from 2000-2001, Lukens (2004) found that the attrition rates of women and men were equal (7.4%). Williams (2004) in her study of special educators in North Carolina reported that the rates of attrition among women and men did not differ significantly. One study of teacher career behavior in Texas found that women had slightly lower rates of attrition than men (7.8% versus 8.8%) (Texas Teacher Retention Mobility and Attrition, 1995). No other studies reported similar results to those documented in the Texas study. None of the studies that were reviewed indicated that gender influences the attrition rates of special and general educators differently.

Ethnicity. The findings related to the influence of teachers' ethnic characteristics on career decisions remain somewhat mixed. Several studies have reported that teachers who are white tend to leave the classroom at higher rates than people of color (Clewell & Villegas, 2001; Gritz & Theobald, 1996; Hanushek et al., 2004; Murnane et al., 1991). Ingersoll (2001) found that the odds of leaving the classroom were 11% higher for whites than the odds of leaving for people of color. Adams (1996) in his study of 2,327 newly hired teachers in a large Texas school district found that whites were 385% more likely to leave their positions than people of color. Billingsley et al. (1995) reported that nearly 80% of special and general educators who left teaching between 1990-1993 in Memphis,

Tennessee, were white, whereas approximately 20% of teachers who left the education profession were people of color.

Conversely, several studies found that people of color had higher attrition rates than whites. Marvel et al. (2007) found that compared to Whites (8.2%), Blacks (11%) and Hispanics (9.3%) left teaching at higher rates. Williams (2004) found that individuals who identified themselves as black were significantly more likely to leave their positions than those who identified themselves as white. In a study of more than 10,000 teachers, the Texas Teacher Retention, Mobility, and Attrition study (1995) found that American Indians (13.3%) and Asians (10.4%) left the classroom at the highest rates and Hispanic teachers (6.7%) left at the lowest rate. White teachers had an attrition rate of 8.5% (Texas Teacher Retention, Mobility, and Attrition, 1995).

Two studies found that the attrition rates of whites and people of color were similar. Lukens et al. (2004) found that white teachers had attrition rates of 7.4% and people of color had attrition rates that ranged between 7.4% and 7.5%. Using similar data Whitener et al. (1997) reported that white teachers had attrition rates of 6.5% and people of color had attrition rates of 6.8%. In her longitudinal study of special educators' career paths, Singer (1993) found that teachers' ethnicity did not influence employment durations. One stable finding concerning the influence of teachers' racial characteristics on attrition was that special and general educators do not have different rates of attrition based their racial or ethnic background.

Family factors. According to Stinebrickner (1998), “[family] variables influence the non-pecuniary benefits of teaching relative to other options that a person considers” (p. 131). For example, teachers' work and vacation schedules provide abundant time for

parenting and familial interaction. The teaching profession also allows for greater periods of family leave time than many other professions (Murnane et al., 1991). Due to accommodating labor policies teachers who leave the classroom to parent or to attend to other family matters for protracted amounts of time can expect to return to work and not suffer a loss in pay-grade or benefits.

Using teacher follow-up data from 1987-1988 to 1988-1989, Boe et al. (1997) found that teachers who reported a change in marital status were two times more likely to leave their positions than teachers who reported no change. Consistent with this finding, Stinebrickner (1998) reported that the risk of leaving teaching increased substantially for both married women and married men. In a more recent investigation, Stinebrickner (2002) found that the risks of leaving teaching were 1.94 times greater for married women than non-married women.

The presence of dependent children has been found to be associated with teachers' decisions to leave the classroom. Boe et al. (1997) found that an increase in the number of dependent children from 1 to 2, to 3 or more decreased the attrition rates of both women and men from 4.9% to 3.3%. Stinebrickner (1998) reported that having two or more children significantly reduced the risk of leaving teaching for men by 51%. Stinebrickner (1998) determined that having multiple children also lowered the risk of leaving for women, but less so because women were probably more likely than men to leave teaching to engage in full-time parenting. In a combined sample of women and men, Boe et al. (1997) found that 28% of teachers who left the classroom reported the birth of a new child. In his study of the relationship between family variables and teacher

attrition, Stinebrickner (2002) found that the risks of leaving teaching were 7.83 times greater for women with a newborn child than women who did not have a newborn child.

It is clear that changes in marital status and the presence of dependent and newborn children influence teachers' decisions to leave the classroom. Murnane et al. (1991) and Singer (1993b) have noted that more women than men who leave teaching return to the classroom after their children become of school age. None of the studies included in this review indicated that changes in marital status or the presence of children influenced the career decisions of special and general educators differently.

Cognitive and affective factors. The ability to effectively cope with the stress of teaching has been hypothesized to influence teachers' career decisions (Billingsley, 1993; Brownell & Smith, 1993). Two studies found that teacher' affective reactions to work influenced decisions to leave the classroom. Using a Likert type rating scale to measure perceived stress, Miller et al. (1999) found that special educators who left their positions had higher levels of perceived stress than those who stayed ($M = 16.58$, $SD = 5.93$ versus $M = 15.00$, $SD = 5.05$). Analyzing qualitative data, Brownell et al. (1994-1995) reported that special educators who possessed effective coping skills were more likely to remain in the classroom than those who did not manage stress effectively. For example, teachers in the Brownell et al. (1994-1995) study who remained in their positions indicated that they engaged active coping strategies such as directly addressing work related problems and changing personal beliefs when appropriate. In contrast, teachers who left their positions engaged more passive coping strategies such as crying or ignoring work related problems (Brownell et al., 1994-1995). There were no studies in this review that reported on general educators career decisions based on affective reactions to work.

Summary

This literature review focused on current knowledge related to teacher attrition in special and general education with reference to Billingsley's (1993) conceptual model of the influences of teachers' career decisions. This review has shown that external, employment, and personal factors influence teachers' decisions to leave their positions. One important theme that emerged from this review was that beginning teachers were at risk for leaving their positions early in their careers. This pattern of risk was similar for both special and general educators, but the literature was less clear on which group of teachers leaves the classroom sooner. Regarding the influence of gender on teachers' decisions to leave the classroom, young women and especially those with newborn children appear to be at an increased risk for attrition. Men were also found to be at risk for leaving, but less so than women. The risk of attrition did not differ for women or men prepared as either special or general education teachers. Teacher's racial backgrounds influenced decisions to leave the classroom. Although a number of the studies indicated that teachers who were white left their positions more frequently than teachers of color, findings related to the nature of the relationship between teachers' career decisions and teachers' racial/ethnic backgrounds remains less clear. None of the studies reviewed indicated that special or general educators had different risks of attrition based on racial/ethnic characteristics. Of the 41 studies reviewed none examined the relationship between teachers' preparation as special or general educators and grade level work assignment. Only one study addressed the interaction between gender and grade level work assignment. Better understanding of how interactions such as these influence the

risk for attrition among particular groups of beginning educators could lead to the formulation of interventions aimed at supporting career persistence.

The current study will contribute to the existing research base by examining the impact of personal and employment related variables on the risk of leaving teaching for beginning educators. In particular, there is a need for research into the influence that personal demographic characteristics and specific employment factors have on the risk of attrition. More specifically interactions among such variables should be explored. The quality of education experienced by students with disabilities and students who are underserved (e.g. those living in poverty and those at-risk for school failure) could benefit from an expanded understanding in these areas.

Drawing from these findings, I will address the following research questions and hypotheses in this dissertation.

1. Do the risks of attrition differ for (a) special and general educators, and (b) assignments as either elementary or middle & secondary teachers?

Null Hypothesis: There is no relationship between the risk of teacher attrition and employment related variables.

- a) There is no relationship between teacher type (special or general education) and the risk of attrition.
 - b) There is no relationship between teacher grade level (elementary or middle & secondary) and the risk of attrition.
2. Do the risks of attrition differ for (a) women and men, and (b) teachers who are white and teachers of color?

Null Hypothesis: There is no relationship between the risk of teacher attrition and personal demographic variables.

- a) There is no relationship between teacher sex (female or male) and the risk of attrition.
- b) There is no relationship between teacher ethnicity (white or person of color) and the risk of attrition.

3. Do special and general education teachers have different risks of attrition based on their work assignments as either elementary or middle & secondary teachers?

Null Hypothesis: There is no relationship between the risk of teacher attrition and the interaction among employment related variables.

- a) There is no relationship between the interaction between teacher type (special or general education) and teacher grade level (elementary or middle and secondary) and the risk of attrition.

4. Do women and men have different risks of leaving based on their work assignments as either elementary or middle & secondary teachers?

Null Hypothesis: There is no relationship between the risk of teacher attrition and the interaction between employment related variables and personal demographic variables.

- a) There is no relationship between the interaction between teacher grade level (elementary or middle and secondary) and teacher sex (female or male) and the risk of attrition.

CHAPTER II

METHOD

The data set that was used in this study came from a large-scale survey project that focused on the early career outcomes of professionals in the fields of education and social services. The data set contains information related to the demographic characteristics and employment outcomes of special and general educators.

Data Source

Data for this study were selected from the 2007 Student Follow-up Survey (SFS) project, which the Office of the Dean at the College of Education (COE) at the University of Oregon conducts. The SFS began in October 2006 to assess the employment outcomes of COE graduates and document their perceptions of their experiences while at the COE (Bullis et al., 2007).

The SFS is an annual cross sectional examination of COE graduates 1, 3, and 5-years after graduation from the COE. In an era of increased accountability on the part of public agencies, the importance of understanding employment outcomes is vital to the continued success of both students and professional training programs. Therefore, the Office of the Dean established a standardized data collection system through which to gather post-graduation data on former COE students.

In 2007 the Office of the Dean surveyed 1,386 graduates from the 2002, 2004, and 2006 graduating classes. Using this design allowed for an examinations of outcomes among graduates at 1, 3, and 5-year intervals beyond degree completion. Data for the

SFS project were collected with reference to a conceptual framework that focused on three constructs (a) employment outcomes, (b) satisfaction with professional preparedness, and (c) graduate demographic characteristics. These three constructs were established through a review of the professional literature related to career development (Billingsley, 1993; Lent, Brown, & Hackett, 1994). Thus, the variables included in the SFS data set are aligned with the conceptual model and research questions addressed by this study and are reflective of Billingsley's (1993) demographic and employment constructs. The University of Oregon Institutional Review Board approved the SFS project. Individual participants in the SFS project cannot be identified; therefore outcome data cannot be paired with individual respondents. Moreover, differences in outcomes can only be observed at the group level in this study.

Measures

Student Follow-up Survey Instrument

The SFS was designed by the researcher and College of Education faculty to measure the post-graduation employment outcomes of former COE students (Appendix B). The conceptual basis for the survey instrument came from a review of the career adjustment literature (Billingsley, 1993; Lent et al., 1994) and extensive revisions were based on input from multiple stakeholder groups including students, faculty and staff.

The design and finalization of the survey instrument happened in a six-step process. First, after a review of the career adjustment literature Bullis et al. (2007) determined that survey should primarily focus on the employment outcomes of graduates. Second, we drafted a series of items that reflected the outcome of interest. For example, items asked graduates to provide information related to their current employment status

and demographic background. Third, focus group meetings were held with key stakeholder groups within the COE including faculty, staff, and students to discuss the design and wording of the survey instrument. The focus group provided input pertaining to how well the survey addressed issues of cultural diversity and the early career employment experiences of the COE graduates. Fourth, Professor Patricia A. Gwartney, an expert in the area of survey research, provided consultation related to the visual composition of the instrument and the ordering of the response categories. Fifth, the survey was pilot-tested with 20 students who were nearing graduation representing each academic department. These students were asked to review the survey and provide feedback regarding how well the survey addressed post-graduation employment outcomes. Finally, based on the feedback received the instrument was revised. The primary revisions included the rewording and reordering of items on the survey.

Pilot Testing

Following instrument development, the survey was mailed to 995 graduates who were 1 and 3-years beyond program completion. The survey results were then analyzed using basic descriptive statistics and modifications were made to the survey instrument. Specifically, several items were revised (e.g., changes in the language used in the item stems related to employment outcomes) and response categories were amended (e.g., reordered). The final version of the survey includes 17 items. Fifteen of the items are rated on a Likert type scale (e.g. response option range 1–4 with 1 being *low* and 4 being *high*). The remaining two items are open-ended, calling for a narrative response.

Procedures

The COE administers the SFS to former students following graduation to gauge the early employment outcomes of those individuals. Graduates are surveyed 1, 3, and 5-years after their graduation during the Fall term with a second survey (a duplicate of the first) mailed to non-respondents in the Winter term. The next two sections detail the recruitment and data collection procedures used in the SFS project.

Recruitment and Data Collection

The Office of the Dean carries out the recruitment of participants. The method of recruitment is consistent with the procedures formulated by Dillman (2000) as effective strategies for inviting individuals to participate in a survey process and include the mailing of personalized survey documents and making multiple attempts to involve potential participants through multiple direct mail contacts. Participant addresses for the survey were gathered through a multi-step process. The COE maintains a database of the names and contact information of its graduates. Staff from the Office of the Dean queries the database to identify graduates in the target years. Recruitment documents are mailed to all graduates from the COE and include an invitation to participate and a letter explaining the survey's importance and purpose.

The process that was used for data collection also is based on Dillman's (2000) authoritative text. Figure 2 presents a visual representation of the data collection process.

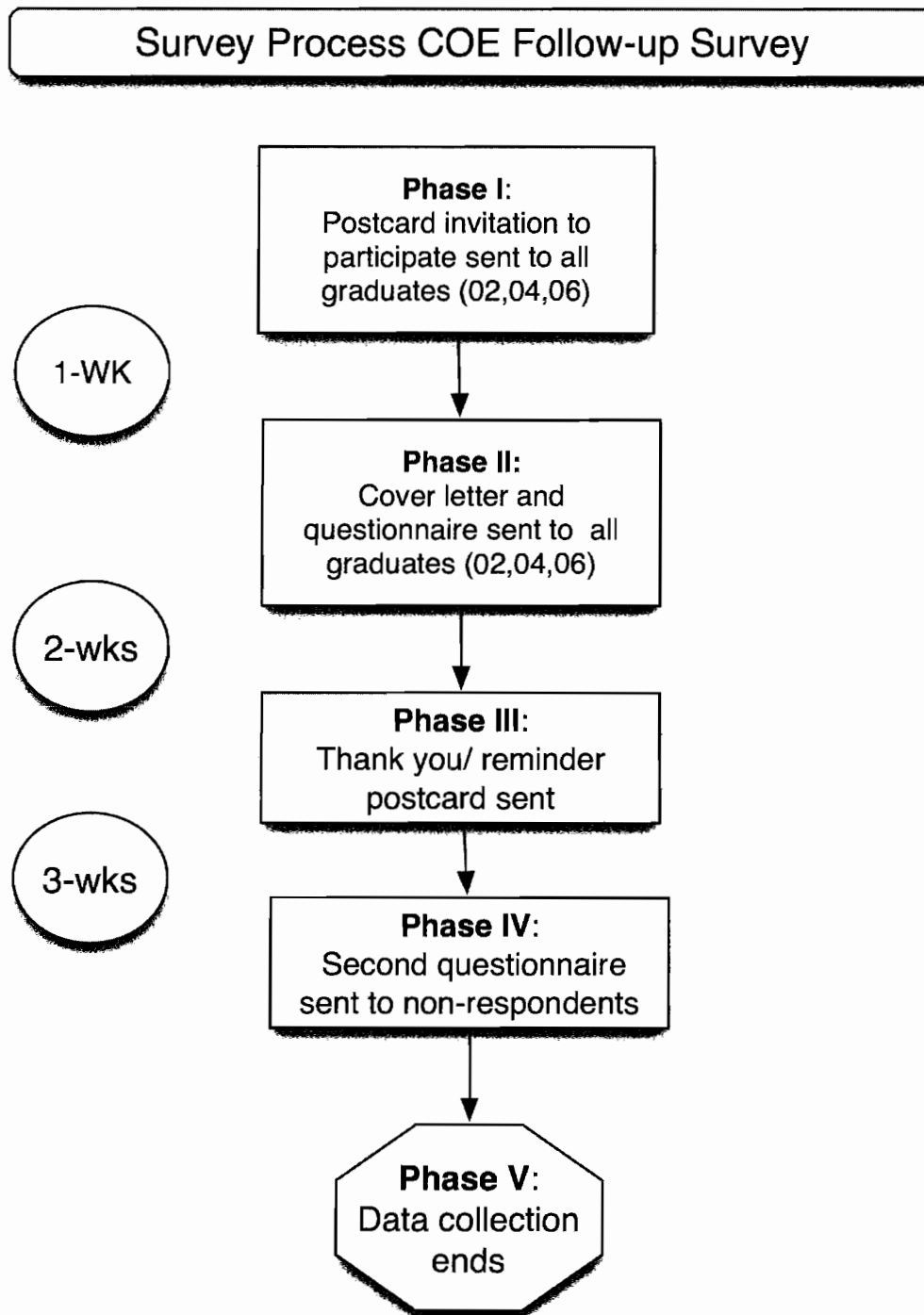


Figure 2. Student Follow-up Survey Process

As Figure 2 shows, at the beginning of the survey process all graduates are mailed a personalized invitation to participate. One week later a personalized recruitment letter is sent along with the survey to all individuals who were originally invited to participate. Next, a thank you/reminder postcard is sent to graduates to encourage response. Specifically, the thank you/reminder post card thanks those individuals who have already participated in the survey for their participation and urges those who have not to do so. Finally, one week later a second questionnaire (a duplicate of the first) is mailed to all non-respondents. Graduates are asked to return their survey in the self-addressed stamped envelope and individuals who choose not to complete the surveys are similarly asked to return incomplete survey materials.

To increase the likelihood of response the survey was designed to be brief and to be completed in less than 15 minutes. According to Groves et al. (2004) surveys that are short in length and simply constructed decrease participants cognitive burden and increase the likelihood of response. Brief surveys have also been shown to improve overall data quality (Biemer & Lynberg, 2003). A computer scans the completed surveys and the data automatically populate a simple database. Computerized scanning of the surveys essentially eliminates problems associated with data entry error and significantly increases the overall quality of survey data (Biemer & Lynberg, 2003). The open-ended responses are entered manually by project staff into a simple qualitative database in the Office of the Dean.

Sample Characteristics

The SFS sample for this study consists of those graduates from the COE who responded to the 2007 SFS. Of the 1,386 surveys mailed in the 2007 SFS, a total of 574

were returned for a response rate of 42%. Appendix C presents the demographic characteristics of the SFS respondents. The vast majority of participants were female (81%, $n = 465$) and white (85%, $n = 481$). Individuals who were prepared by the COE to work in the field of education comprised 74% ($n = 425$) of the sample. The remaining 26% ($n = 149$) of participants were prepared to work in social services. Most participants were trained to be general educators (82%, $n = 187$). Special educators made up 18% ($n = 39$) of the sample. A total of 56% ($n = 125$) of participants had completed teacher preparation programs at the elementary level, and 44% ($n = 101$) had been prepared at the middle and secondary levels.

Any survey that relies upon survey respondent data from some portion of a target group (either representative sample or, in this case, a population) needs to determine how alike or different the respondent group is to the population or target group. The most common method for establishing differences is to examine if the individuals of interest in the respondent group are proportionally represented in the target group (Greenwood & Nikulin, 1996). I tested this assumption by directly calculating a chi-square test at a .05 alpha level.

The COE population data that was used for comparison reflects the characteristics of the graduating class of 2006 prior to students leaving the COE. This data set is the most reliable and detailed source of graduate population data at this time and comes from extant data at the COE. Currently the COE does not have archival data that reflects the demographic characteristics of its graduate populations prior the class of 2006.

I compared the SFS sample to the COE graduate population across essential variables included in the SFS project. Specifically, I compared the two groups on the

following variables: (1) ethnicity, (2) gender, (3) teacher type, and (4) teacher grade level. I adopted an overall alpha level of .05, apportioning the statistical significance for each comparison at .0125 (.05/4 comparisons). Table 1 shows a comparison of the SFS sample to the COE population in 2006. There were statistically significant differences between the two respondent groups on three variables (i.e., gender, teacher type, and teacher grade level).

There were a greater proportion of women in the SFS sample than in the COE population (80% versus 77%). Additionally, the SFS sample was made up of 55% (n = 125) of graduates who were prepared to teach at the elementary level, compared to 65% (n = 132) in the COE population. Graduates who were trained as middle/secondary teachers comprised 44% (n = 101) of the SFS sample where as 35% (n = 71) of COE graduates were prepared for service at the same level.

Description of the Data Set & Variable Selection

The data for this study were selected from the SFS project data set. Table 2 shows the alignment between the constructs presented in the literature review and variables selected for study that are included in the SFS data set. Graduates prepared for employment as special educators were classified as special education teachers. Graduates prepared as general educators were classified as general education teachers, and were treated as the comparison group for this study.

Table 1

Comparison of All SFS Participants to the General COE Exiting Population

Demographic characteristics	SFS Sample		COE Sample		χ^2	Df	p
	n	%	n	%			
Gender							
Male	108	20	80	23	5.57	1	.02
Female	465	80	271	77			
Valid n	573	100%	351	100%			
Ethnicity							
Person of color	84	15	36	15	0.01	1	.93
White	481	85	212	85			
Valid n	565	100%	248	100%			
Teacher type							
Special Ed.	39	18	21	10	14.41	1	.000
General Ed.	187	82	182	90			
Valid n	228	100%	203	100%			
Teacher grade level							
Elementary	125	56	132	65	8.66	1	.003
Middle/secondary	101	44	71	35			
Valid n	226	100%		100%			

Table 2

Comparison of Conceptual Factors and Variables in the SFS Data Set

Conceptual Factors	Literature Review	SFS Project
Personal Demographics	√	√
Gender	√	√
Ethnicity	√	√
Employment	√	√
Teacher type	√	√
Teacher grade level	√	√

Variable Selection

The following explanatory variables were selected from the SFS data set (a) gender, (b) ethnicity, (c), teacher type (special/general education), and (d) teacher grade level (elementary/middle & secondary) along with one specific outcome variable: teacher attrition (employed as teacher: yes/no). Attrition is defined as the act of leaving the teaching profession (Edgar & Pair, 2005). Attrition was assessed for the respondent sample at 1, 3, and 5-year intervals. This outcome variable was selected because it is aligned with the conceptual foundation of this study and with previous investigations. Further, the assessment of the employment outcomes for educators during their first five-years of practice has an established basis in the investigation of teacher attrition (Murnane et al., 1991; Singer, 1993).

Qualitative Comments

As mentioned previously in this chapter, the SFS instrument was designed to collect both quantitative and qualitative data. This study is not a mix methods examination, but when possible the qualitative comments that were provided by respondents will be used to illustrate findings in the discussion of the results. The comments were hand entered by staff working on the SFS project and were organized by academic department and program. For example, comments provided by respondents who had graduated from the special education department in teacher certification programs were grouped as such.

Missing Data

Missing data is common in cross-sectional surveys of large groups of individuals. The SFS data set contains missing data; these are noted in each bivariate table (Appendix C). In this study each of the explanatory variables are demographic in nature and missing data may be attributable to the (a) respondent choosing not to answer the question and (b) respondent providing an invalid response. The SFS project worked to ameliorate these problems in a number of different ways. First, all sensitive demographic questions were presented last on the survey. Dillman (2000) notes that this strategy will increase the likelihood of response. Second, as mentioned previously the survey was thoughtfully designed. Third, multiple surveys were mailed to possible respondents. Finally, to increase the reliability and validity of the data, all survey data was computer scanned and entered. These data collection techniques reduced the likelihood that data are not missing at random. Although these precautions were taken, a portion of the missing data may be non-random – meaning that data may be missing due the data's relationship other

variables in the study. Moreover, if after the multivariate analysis it becomes apparent that non-random missing data presents a problem additional analyses will be conducted in accordance with the suggestions of Tabachnick and Fidell (2007). The most common method suggested to address this problem is imputation of missing values. Due to the noncomplex nature of the SFS data set it is not likely that nonrandom missing data will pose an issue for this study.

Data Analysis

This section describes the data analysis procedures that were used to address each of the four-research question included in this study.

Cox Regression

The research questions and the dataset I will use to answer those questions are uniquely suited to the Cox regression procedure because they examine the risk of teacher over time (Adams & Dial, 1993; Hosmer & Lemeshow, 1999; Singer & Willett, 2003; Willett & Singer, 1989). Cox regression is used for the analysis of time-to-event data; or the time it takes an individual to present a given outcome (Cox, 1972). Cox regression utilizes a proportional hazards model for the analysis of survival rates by estimating the risk of failure relative to a particular outcome variable over time given certain predictor variables. Classically this model is used in the field of medicine to examine the duration between the time of diagnosis with a terminal disease and the event of death. In this study Cox regression will be implemented to examine the duration between graduation from a teacher preparation program and the event of leaving teaching.

Event

The event variable in the Cox regression procedure is classically treated as a binary occurrence (Garson, 2008) and in this study the event of interest is teacher attrition (0 = attrition and 1 = employed as a teacher).

Time

The time variable in the model is a measure of duration to the event of interest. In the present study the event (i.e. attrition) will be assessed at 1, 3, and 5-year intervals. The Cox proportional hazards model treats time as an outcome measure given the covariates included in the model.

Censored Data

In a study such as this, with teacher attrition as the event, Cox's proportional hazards model focuses on attrition during any time period (Garson, 2008). In a study of teacher attrition it is not possible to know when all teachers will leave the profession, or the time it will take them to do so. As a result, data contain censored (those individuals who never experience exit attrition during the measurement period) and uncensored (those experience attrition) observations (Garson, 2008). The Cox proportional hazards model appropriately accounts for both censored and uncensored cases and thus is the appropriate statistical method to use in the examination of attrition among new special and general educators (Willett & Singer, 1989).

Covariates

In the model, "...one or more predictor variables, called covariates, are used to predict a status [event] variable" (Garson, 2008, p. 1). Covariates in the Cox model can be expressed categorically (e.g., 0/1) or continuously (e.g., 1, 2, 3, 4...). Covariates (a

covariate is a variable that may be predictive of a specified outcome under study) can either be time-fixed or time-dependent. For example sex is a time-fixed covariate because it does not change over time, where as age is time-dependent because it changes from year to year. In this study, the covariates (sex male/female; teacher type special/general education; teacher grade level elementary/middle & secondary; and ethnicity white/person of color) selected for examination are expressed categorically and are all treated as time-fixed. The Cox model, “does not assume any particular form for the baseline hazard but does assume that the [covariates] have the same proportional effect on the duration of the spell” (Imazeki, 2005, p. 434). Said differently, a one-unit change in the covariate(s) influences the odds of attrition, and this change is assumed to be the same in every time period which is examined (Imazeki, 2005).

Proportional Hazards Model

For this study I employed a multivariate Cox proportional hazards regression model as suggested by Hosmer and Lemeshow (1999) and Willett and Singer (1989). The complete model takes the form:

$$\begin{aligned} \log_e [h_p(t)] = & \log_e [h_o(t)] + \beta_1 Teacher_{type_p} + \beta_2 Sex_p + \beta_3 Ethnicity_p + \\ & \beta_4 Teacher_{gradelevel_p} + \\ & \beta_5 Teacher_{type_p} \cdot Teacher_{gradelevel_p} + \beta_6 Teacher_{gradelevel_p} \cdot Sex_p \end{aligned}$$

In the Cox proportional hazards model p represents the p_{th} person in the investigation. The unknown baseline hazard is represented by $h_o(t)$ and time is represented in the model by (t) . The unknown population parameter that is estimated is represented by β (Willett & Singer, 1989). “ If β is positive, larger values of [the covariate] X are associated with higher hazard; if β is negative, larger values of [the covariate] X are associated with lower

hazard; if β is near zero then [the covariate] X is unrelated to hazard” (Willett & Singer, 1989, p. 427). The Cox proportional hazards model used in this study addressed each of the four research questions by determining which variables (employment or personal demographic) contributed to the risk of teacher attrition during the first five years of practice.

Fitting the Model

In this study I employed a Cox proportional hazards model to assess the risk of attrition for special and general educators during 1, 3, and 5-year intervals. To model the risk of attrition for special and general educators during the specified time periods I followed this set of steps. The first step in fitting the Cox regression model begins with the bivariate analysis of each variable selected for model development to determine statistical significance (Hosmer & Lemeshow, 1999). In this first step, statistical significance is determined using an omnibus chi-square test with $k-1$ degrees of freedom. Hosmer and Lemeshow (1999) suggest including all variables in the final multivariate model from the bivariate analysis that are significant at the .20-25 alpha level plus all variables that are of theoretical importance.

The second step in the development of the multivariate model requires that the model be fitted with the variables selected from the first step. The variables selected from step one are placed together in the multivariate model. The inclusion of these variables leads to the establishment of the initial multivariate model (Hosmer & Lemeshow, 1999).

Next, the p -values from Wald test statistic are calculated and used to determine if any of the covariates can be removed from the model due to nonstatistical significance. This action is taken so that the multivariate model more accurately reflects the

phenomena being studied and confounding variables, which do not contribute explained variance to the model, do not interfere with overall model functioning (Hosmer & Lemeshow, 1999).

Once the reduced model has been fitted, it is necessary to determine if any of the removed covariates "...produced an *important* change in the coefficients of the variables remaining in the model" (Hosmer & Lemeshow, 1999, p. 160). If the removed covariate produced an approximately 20% change in the coefficient it is deemed an important confound and should be added back to the model (Hosmer & Lemeshow, 1999).

Finally, all variables that were removed from the model in the previous step are then added back to the model to confirm that they are neither a confound or statistically significant (Hosmer & Lemeshow, 1999). Once this last step has been completed, the main effects model for the Cox regression is finalized. The main effects model then permits the examination of interactions among variables. Interactions among variables that are judged to be of conceptual importance are added to the model in the form (A x B). Once the interaction term has been added the complete model is then estimated.

Based on the nature of the SFS data set and my review of the available literature, I decided to include in the Cox model at 1, 3, and 5 years beyond program completion, 2-way interactions between teacher type and grade level, and gender and grade level, with respect to attrition at each of the three data points. The final model also included all covariates retained through the process described above and the identified interaction term.

When the final model was analyzed, I will conducted an overall goodness-of-fit test (Hosmer & Lemeshow, 1999) to describe how well the specified model illustrates the

event (outcome) of interest, which in this case relates to teacher attrition at 1, 3, & 5 years. Hosmer and Lemeshow (1999) note that there are several measures to assess the goodness of a fit of a Cox regression model, but the most appropriate measure at the current time is log-likelihood. Log-likelihood assesses goodness-of-fit via the computation of a p -value from the Chi-square distribution (StatSoft, 2008). A finding from the goodness-of-fit test this is statistically significant at the .05 alpha level indicates that model adequately fits the data (Garson, 2008). According to Garson (2008) well-fitted models show that at least one of the covariates explains the duration to event observed. Accordingly, I employed the log-likelihood measure in this study to assess the estimated Cox models.

Interpreting Cox Regression Models

The hazard ratio, one of the outputs from the final Cox regression model, describes the odds of an event happening. Specifically, Cox regression coefficients are expressed as odds ratios, which are the probability that an event will occur as compared to the probability that the event will not occur. The odds ratio is equivalent to the hazards ratio for a given covariate in the Cox model (Garson, 2008). “The odds ratio is the predicted change in the hazard for a unit change in the predictor” (Garson, 2008, p. 19). In addition, positive coefficients have odds ratios greater than 1.0 and negative coefficients have odds ratios that are less than 1.0. “Odds ratios above 1.0 are associated with increased hazard of the event, and odds ratios below 1.0 are associated with decreased hazard of the event” (Garson n.d., p. 19) Also included in the results of a Cox regression model are: chi-square test of significance, degrees of freedom, probability

value, and the confidence interval. These additional statistics aid in model interpretation by providing measures of statistical significance and specificity.

Survival plots are a critical component of the output from a Cox regression analysis. The plots allow the researcher to determine if the hypothesized theoretical relationships between variables in the model were accurately specified (Hosmer & Lemeshow, 1999). Through visual inspection of the plots the researcher can determine if the functions that are represented are consistent with hypothesized relationships among key variables that are suggested in the literature base. In cases in which statistically insignificant results are found, survival plots can be used to illuminate the practical or theoretical significance of research findings (Hosmer & Lemeshow 1999).

The survival plot is organized with cumulative survival time (i.e. time in years) on the *X*-axis and cumulative survival probability (i.e. the likelihood that individuals will remain in the teaching profession) on the *Y*-axis of the graph. The survival functions demonstrate that survival (i.e. retention in the teaching profession) decreases over time for the groups of individuals included in this study. That is, the survival plots show a “comparative measure of survival experience over the entire time period [observed]” (Hosmer & Lemeshow, 1999, p. 116).

CHAPTER III

RESULTS

The purpose of this study was to examine the influence that select personal and employment factors have on the risk of leaving the classroom for beginning special and general educators, using data from the University of Oregon College of Education *Student Follow-up Survey* project (Bullis et al., 2007). In this chapter I describe the results of the analyses conducted for each of the four research questions. Before addressing those questions, I first describe the sample I used in this dissertation.

Descriptive Statistics for Special and General Educators

Table 3 presents a cross tabulation of selected descriptive statistics for (a) the SFS sample, (b) special educators, and (c) general educators. The majority of special education ($n = 24$, 62%) and general education teachers ($n = 104$, 56%) in this study were prepared to work at the elementary level. Most special education teachers were female ($n = 32$, 84%) and white ($n = 28$, 74%). The same was true for general educators (female, $n = 145$, 78%; white, $n = 164$, 90%). Both special and general education teachers had employment rates that exceeded 85% (special education 90%, general education 88%).

Table 3

Select Characteristics of the Student Follow-up Survey Sample

Variables	SFS Sample		Special Educators		General Educators	
	n	%	n	%	n	%
Teacher Grade Level						
Elementary	125	56%	24	62%	104	56%
Middle/Secondary	101	44%	15	38%	83	44%
Valid n	226	100%	39	100%	187	100%
Missing Data	346	60%				
Teacher Sex						
Male	108	19%	6	16%	42	22%
Female	465	81%	32	84%	145	78%
Valid n	573	100%	38	100%	187	100%
Missing data	1	.17%				
Teacher Ethnicity						
Person of color	84	15%	10	26%	18	10%
White	481	85%	28	74%	164	90%
Valid n	565	100%	38	100%	182	100%
Missing data	9	1.6%	1	3%	5	3%

Table 3

Continued

Variables	SFS Sample		Special Educators		General Educators	
	n	%	n	%	n	%
Employed as Teacher						
Yes	252	53%	35	90%	165	88%
No	224	47%	4	10%	22	22%
Valid n	476	100%	39	100%	187	100%
Missing data	98	17%				
Time						
Year 1	234	41%	16	41%	86	46%
Year 3	177	31%	9	23%	51	27%
Year 5	163	28%	14	36%	50	27%
Valid n	574	100%	39	100%	187	100%
Missing data	0					

Research Questions One and Two

I calculated a Cox regression analysis to address research questions one and two. The model was developed using the methods described in Chapter II to specify the risk of early career attrition for beginning educators during the first five years of professional

practice. None of the variables in the main effects model were statistically significant at the .05 alpha level. Table 4 shows the results of this analysis. Following recommendations by Hosmer and Lemeshow (1999) regarding variable retention in Cox analyses, I made the decision to include all of the non-statically significant variables in the final main effects model due to their theoretical importance in Billingsley's (1993) conceptual model and in the literature base presented in Chapter 1. According to Hosmer and Lemeshow (1999) the rationale for retaining non-statistically significant variables in the main effects model is related to a variables potential to be an "important confounder" or a contributor to statistical significance.

Table 4

Summary of Cox Regression Analysis for Personal and Work Related Factors Predicting Teacher Attrition (N = 226)

Variable	β	SE	p	Hazard Ratio (e^{β})	95% CIE
Teacher Type	-.19	.55	.74	.83	.28—2.45
Teacher Grade Level	.62	.41	.13	1.85	.83—4.13
Sex	.85	.62	.18	2.33	.69—7.91
Ethnicity	-1.04	.75	.17	.36	.08—1.53

Note. Log-likelihood = 232.27

To determine how well the estimated Cox regression model specified the risk of attrition an over-all goodness of fit test was conducted. The omnibus test of model coefficients for research questions one and two showed that the main effects model was not a statistically significant improvement over the null model in which time was the

is that time alone would produce the same risk of attrition as the variables included in the model.

Research Question 1: Do the risks of attrition differ for (a) special and general educators, and (b) assignments as either elementary or middle & secondary teachers?

Research question 1 examined the risk of attrition for beginning educators across two work related variables: (a) teacher type (special or general education), and (b) teacher grade level (elementary or middle/secondary). I tested two hypotheses for these variables using the main effects model; specifically, I tested the following hypotheses at the .05 alpha level:

- a) There is no relationship between teacher type (special or general education) and the risk of attrition.
- b) There is no relationship between teacher grade level (elementary or middle & secondary) and the risk of attrition.

Neither of the two work related variables demonstrated statistical significance at the .05 alpha level. Figure 3 and Figure 4 display the survival functions for the work related variables included in the main effects model.

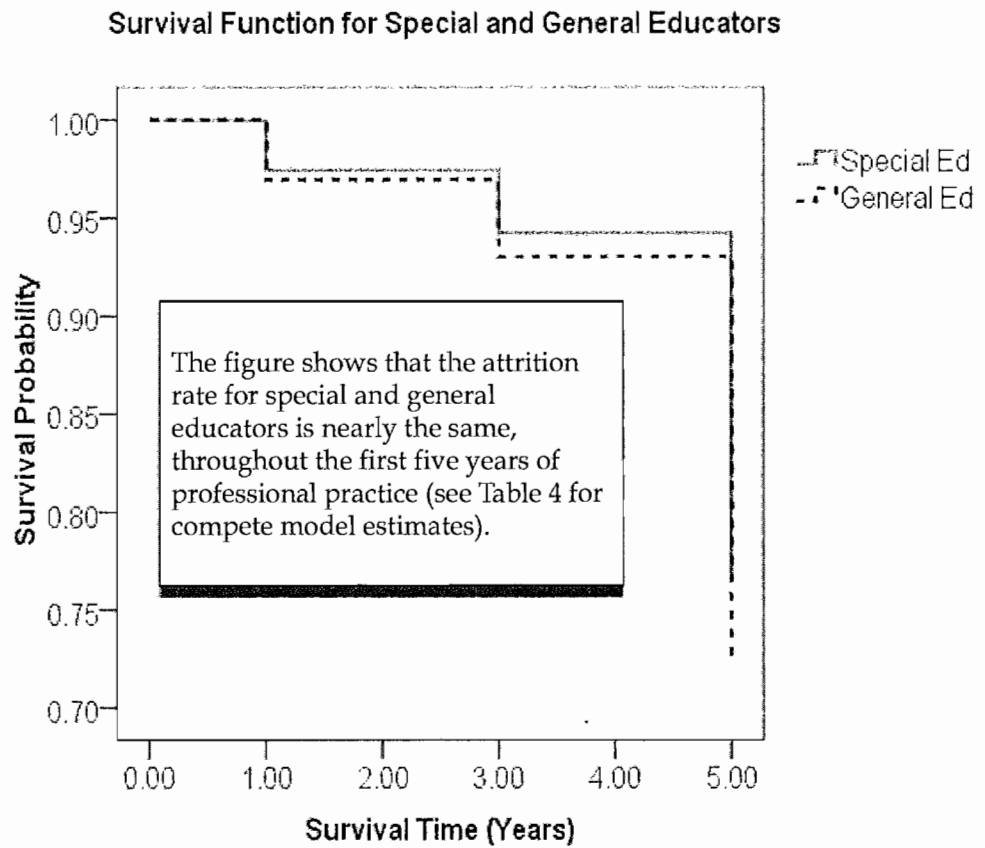


Figure 3. Survival Function for Special and General Educators

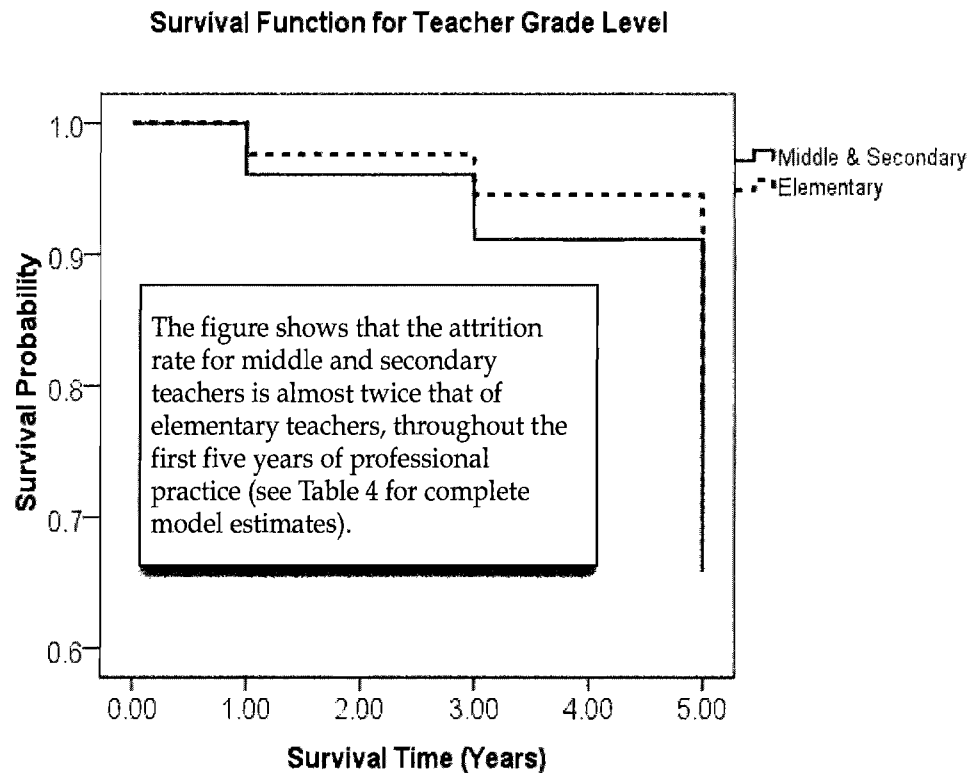


Figure 4. Survival Function for Teacher Grade Level

Research Question 2: Do the risks of attrition differ for (a) women and men, and (b) teachers who are white and teachers of color?

Research question 2 examined the risk of attrition for beginning educators across two personal variables: (a) sex and (b) ethnicity. Two hypotheses were tested using Cox regression analysis. Specifically, I tested the following hypotheses at the .05 alpha level:

- a) There is no relationship between teacher sex (female or male) and the risk of attrition.
- b) There is no relationship between teacher ethnicity (white or person of color) and the risk of attrition.

Neither of the two demographic variables demonstrated statistical significance at the .05 alpha level. Figure 5 and Figure 6 display the survival functions for the two personal factors included in the main effects model.

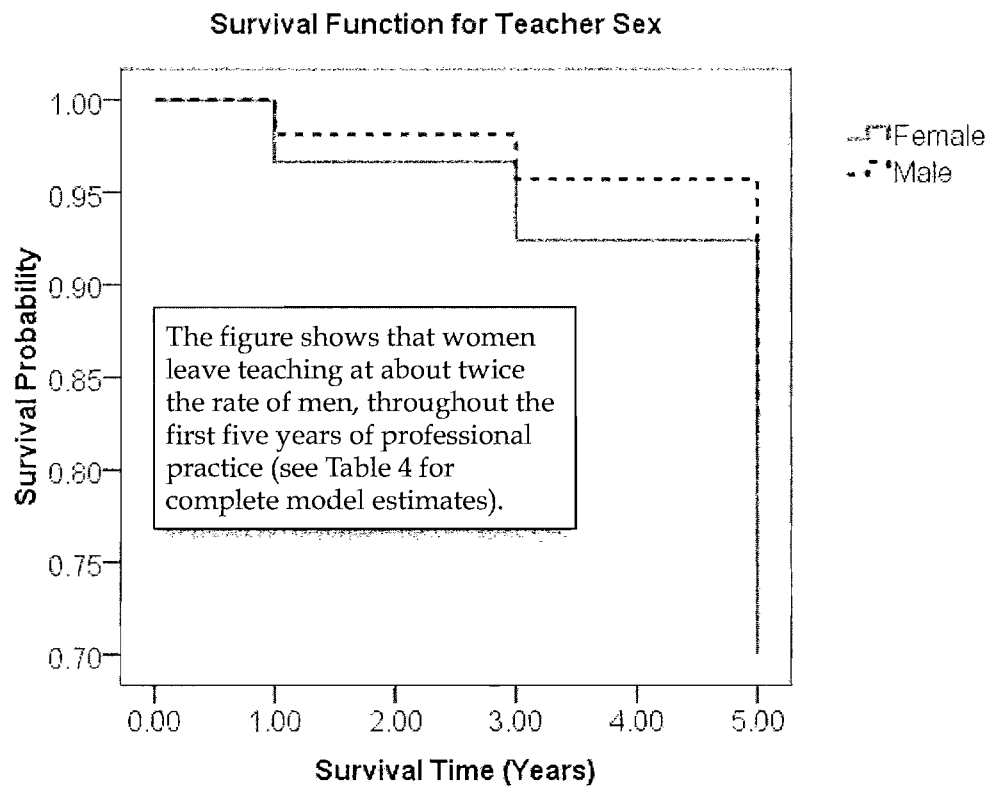


Figure 5. Survival Function for Teacher Sex

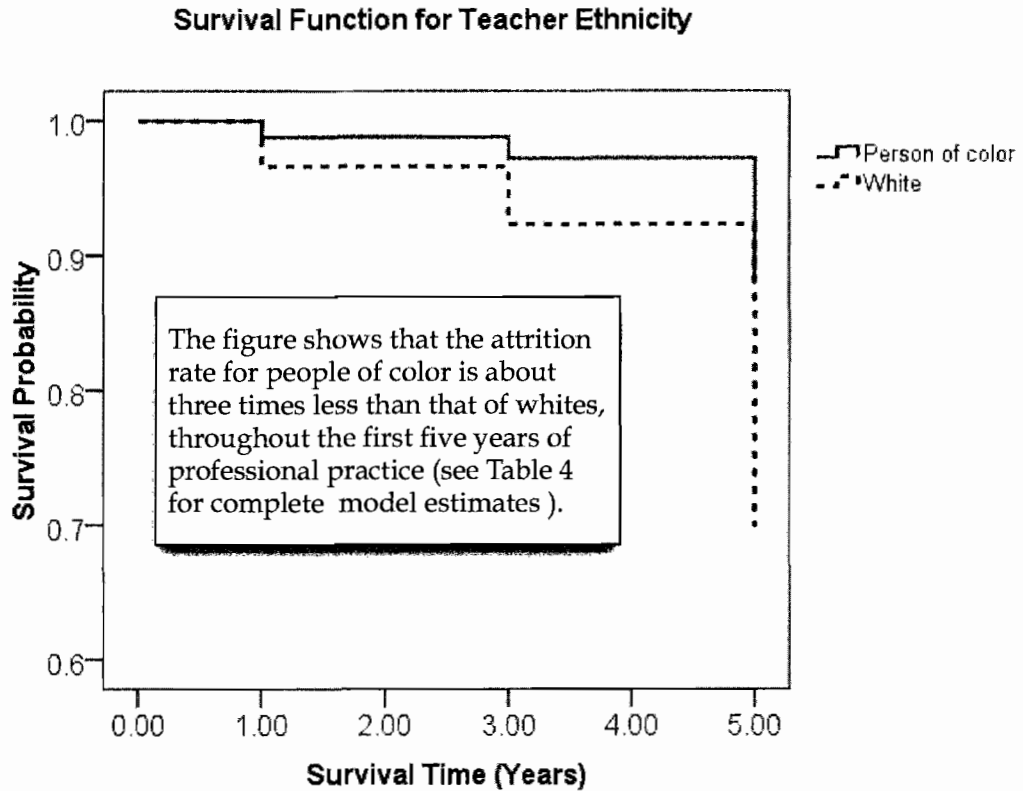


Figure 6. Survival Function for Teacher Ethnicity

Research Questions Three and Four

I examined research questions three and four through the addition of interaction terms to the main effects model using the methods outlined in Chapter II. The results of this analysis are shown in Table 5. None of the variables or interaction terms in the full model were statistically significant at the .05 alpha level.

Table 5

Summary of Cox Regression Analysis with Interaction Terms for Personal and Work Related Factors Predicting Teacher Attrition (N = 226)

Variable	β	SE	p	Hazard Ratio (e^{β})	95% CIE
Teacher Type	-.08	.80	.92	.92	.19—4.42
Teacher Grade Level	-.18	1.25	.89	.84	.07—9.63
Sex	.17	1.10	.86	1.20	.15—9.58
Ethnicity	-1.04	.75	.16	.35	.08—1.53
Teacher Type*Teacher Grade Level	-.25	1.10	.82	.78	.09—6.74
GradeLevel*Sex	.92	1.30	.48	2.51	.19—32.37

Note. Log-likelihood = 231.76

To determine how well the estimated full Cox regression model specified the risk of attrition I conducted an over-all goodness of fit test. The omnibus test of model coefficients for main effects model with the additional interaction terms was not a statistically significant improvement over the null model in which time was the constant ($-2 \log \text{likelihood} = 231.76$, χ^2 (df = 6) = 6.88, $p = .33$). The interpretation of this finding is that none of the variables in the model contributed significantly to the prediction of time until attrition.

Research Question 3: Do special and general education teachers have different risks of attrition based on their work assignments as either elementary or middle & secondary teachers?

Research question 3 investigated two-way interactions between teacher type (special or general education) and teacher grade level (elementary or middle/secondary) as risk factors for early career teacher attrition. One hypothesis was tested was tested at the .05 alpha level using a multivariate Cox regression model. The hypothesis tested was:

- a) There is no relationship between the interaction between teacher type (special or general education) and teacher grade level (elementary or middle and secondary) and the risk of attrition.

Results from this analysis are presented in Table 5. This interaction did not produce statistically significant results at the .05 alpha level.

Research Question 4: Do women and men have different risks of leaving based on their work assignments as either elementary or middle & secondary teachers?

Research question 4 explored two-way interactions between teacher sex (male or female) and teacher grade level (elementary or middle/secondary). One hypothesis was tested at the .05 alpha level using a multivariate Cox regression model. The hypothesis tested was:

- a) There is no relationship between the interaction between teacher grade level (elementary or middle and secondary) and teacher sex (female or male) and the risk of attrition.

Results from this analysis are presented in Table 5. This interaction did not exhibit statistical significance at the .05 alpha level. Although not statistically significant, the two-way interaction between sex and grade level suggests that women working at the middle and secondary grade levels leave teaching at about twice the rate of men working in similar positions throughout the first five years of professional practice.

CHAPTER IV

DISCUSSION

This chapter discusses the results of the four research questions addressed by this study with reference to teacher attrition in special and general education. Implications for practice and future research are considered in relation to the findings. Prior to the treatment of each of the individual research questions, I first address the limitations of this study.

Limitations

This study has three sets of limitations that should be considered when interpreting the research findings. These limitations pertain to (a) sampling, (b) the use of extant data, and (c) generalizability. Each of these limitations is addressed in the sections that follow.

Sampling

This study relied on data that was a subsample of the Student Follow-Up Survey project (SFS) conducted by the College of Education at the University of Oregon. The sample of individuals who participated in the SFS project was a nonprobability convenience sample. A nonprobability convenience sample is not drawn from the target population at random, but instead cases are selected because they are readily accessible (Gall, Gall, & Borg, 2003). The primary empirical concern with convenience samples is that the sample may not accurately reflect the characteristics of the population from which it was drawn. That is, in this study the characteristics of the SFS participants may

be not be the same as those of all College of Education graduates. Moreover, samples such as the one used in this study may be biased by incomplete data that resulted from the sampling technique that was used. For example, when considering the predictor variables examined from a convenience sample there may be variability among these predictors referent to the population. Variability among predictor variables may indicate sampling bias. The second concern pertaining to this sample is that it may not be representative of beginning special and general education teachers in the population of similar teachers at large.

In this study there were a number of significant differences between the SFS sample and the College of Education population of prospective graduates. Caution should be taken when considering the findings from this study because it is not clear if the noted differences impacted the results. It should also be noted that convenience samples are used frequently in the field of educational research (Gall et al., 2003); thus, to verify findings repeated replication of a study is needed to validate research findings.

Extant Data

To answer the research questions addressed by this study extant data was used. The examination of extant data in educational and social science research is a widely accepted and valued practice (Gall et al., 2003). Extant data provides researchers with cost effective access to rich sources of information for analysis. The major limitation of extant data sets is that they are often collected for purposes different than those intended by the researcher. For example, in this study the SFS data set was collected for the purpose of evaluating the employment outcomes of *all* College of Education graduates. This limited the types of research questions that I could examine related to teacher

attrition in special and general education due to a lack of complex data for these subgroups. I dealt with this issue by formulating research questions that considered available data elements in the SFS data set. These data elements were aligned with Billingsley's (1993) conceptual model and with the literature base in this area of research.

Generalizeability

The generalizeability of the results from this study are limited by several factors. First, the study utilized survey data from a nonprobability convenience sample making comparisons to the target population tenuous. Second, the study was non-experimental in nature; therefore causal relationships between the variables included in the study and teacher attrition cannot be determined. Next, the data representing the 1, 3 and 5-year time intervals in which observations were made regarding the employment outcomes of special and general educators correspond to specific years. The labor market conditions experienced by study participants between 2007 and 2002 could be different than those experienced by teachers in either previous or later time periods. Finally, this study only examined teacher attrition at three points in time and does not provide information about the long-term employment trajectories of teachers.

Although these limitations exist, this study addresses an important area of research and serves as a starting point in the study of this critical issue. In the following sections I will discuss the findings from this study and when possible I will use comments provided by respondents to illustrate findings and discussion.

Research Question One:

Employment Factors Associated With the Risk of Teacher Attrition

Research question one examined the risk of attrition for beginning educators based on (a) teacher type (special or general education), and (b) teacher grade level (elementary or middle & secondary). Although no statistically significant findings were produced, the results were somewhat consistent with previous investigations. This study found that special and general educators had similar risks of attrition and that middle and secondary teachers had higher risks of attrition than teachers at the elementary level.

The results concerning the differences in the risk of attrition between special and general educators depart from the majority of the findings in the literature base. This study found that the risk of attrition for both special and general educators appears to be quite similar throughout the first five years of professional practice and increases until the end of the observed time period. Moreover this study suggests that special educators are slightly less likely to leave the teaching profession when compared to general educators.

The literature suggests that special educators, particularly those in the early stages of their careers are more likely to leave the teaching profession than general educators (Boe et al., 2008; Imazeki, 2005; Ingersoll, 2001). For example, Ingersoll (2001) found that the odds of turnover for special educators were 32% higher than those of general educators. The results from this study suggest that special educators have slightly lower risks of attrition than their counterparts in general education at least in the initial five years of practice.

One possible explanation for the observed lower risk of attrition among special educators in this study may be related to the presence of moderating economic factors

that were not accounted for. A significant number of individuals who are prepared to be special educators at the College of Education receive funding through federally sponsored training grants⁴. As a condition of receiving funding, prospective teachers are required to fulfill a service obligation upon graduation. The service obligation requires that graduates work in the field of special education. The average length of service obligations for recent special education graduates from the University of Oregon is approximately three-years (L. Lewis, personal communication, March, 25, 2009). If a funding recipient chooses not to fulfill their service obligation they must repay the funds that supported their professional preparation. After their service obligation is satisfied, special educators can choose to leave the profession or remain in teaching. The greatest increase in the risk of attrition for special educators included in this study occurred between years three and five suggesting that some individuals may leave the profession after their financial obligations are satisfied.

Several studies suggest that the risk of attrition for both special and general educators is the highest shortly after they begin their teaching careers (Grissmer & Kirby, 1987; Singer, 1993; Theobald, 1990). Specifically related to special education, Singer (1993) found that 43% of new teachers were no longer teaching at the end of their first five years of practice. This study found that although the risk of attrition increased over time for both special and general educators, overall the proportion of those remaining in the profession remained relatively high. For example by the end of three-years of

⁴ The exact percentage of individuals who received funding was not readily available due to a lack of complete data, but estimates suggest that historically up to 90% of special education students received professional preparation funding while attending teacher preparation programs at the University of Oregon.

teaching over 90% of special and general educators were still employed. Further, more than 75% of special educators were still teaching during their fifth-year of employment.

A possible explanation for these moderately high rates of retention is that the teachers in this study were well prepared to work in schools. The College of Education at the University of Oregon is ranked in the top 10 college's of education in the country, and in particular the Special Education and Clinical Sciences program is ranked 3rd. Prominent researchers have noted that teachers who are well prepared in rigorous training programs are more likely to be successful in their practice and are more likely to remain in teaching than those who are not adequately prepared to work with students (Darling-Hammond & Sclan, 1996). This study did not examine the relationship between teacher quality and attrition, but the comments provided by participants suggest that high quality training experiences may make a difference in beginning teachers' decisions to remain in the classroom. According to a recent special education graduate: *"The most valuable thing I learned was how to differentiate instruction for all learners. I feel that I was highly prepared to teach, especially in the area of classroom and behavior management."* Another graduate in general education expressed similar sentiments. *"The most valuable thing that I learned in my academic program is strong lesson planning. Having a systematic unit goals and objectives has been important in assessing student progress (high, medium, and low performing students) as well as revising curriculum to meet all students."*

Regarding the influence that teacher grade level (elementary versus middle and secondary) has on the risk of attrition, this study produced results that were consistent with those of previous studies. Numerous investigations have found that teachers working

at the middle and secondary levels are more likely to leave the teaching profession than those working at the elementary level (Lukens et al., 2004; Marvel et al., 2007; Murnane et al., 1991; Whitener et al., 1997). For example, Lukens et al. (2004) found that teachers working at the secondary level left teaching at a higher rate than those working at the elementary level (6.8% versus 8.6%). In another study, Murnane et al. (1991) found that on average elementary teachers stayed in their positions three-years longer than secondary teachers.

The explanation provided for the differences in attrition behavior among elementary and middle and secondary teachers in the literature points to difference in the educational backgrounds of the individuals in these groups. Typically, in addition to training in the field of education middle and secondary teachers have academic credentials in other content areas, where as elementary teachers only have training in the field of education (Murnane et al., 1989). Research suggest that due to their additional training in fields other than education middle and secondary teachers have more opportunities in labor markets outside of education than their counterparts who work at the elementary level (Darling-Hammond & Sclan, 1996). In conclusion this study identified distinguishable differences between the risk of attrition for elementary and middle and secondary teachers.

The findings from this study are consistent with the hypothesized relationship between employment factors and outcomes noted in Billingsley's (1993) model that was used to ground this study. These findings are also in alignment with prior research in the area of teacher attrition concerning the influence of teachers' grade level work assignments on decisions to leave the teaching profession.

Research Question Two:

Personal Factors Associated With the Risk of Teacher Attrition

In alignment with Billingsley's conceptual model, research question two examined the risk of attrition for beginning educators based on two personal factors (a) teacher sex, and (b) teacher ethnicity. Although statistically significant results were not found, the patterns of risk identified in this study for personal variables were consistent with previous investigations in this area of inquiry. In particular this study found that women had higher risks of attrition than men, and that whites had higher risks of attrition than people of color.

The observed higher risk of attrition for women in this study may be explained by other personal factors that were not accounted for. Prior studies that have investigated the differences in the attrition rates among men and women have generally found that women leave the teaching profession more frequently than men (Billingsley et al., 1995; Johnson & Birkeland, 2003; Marvel et al. 2007; Whitener et al., 1997).

When the interaction of gender with other personal factors is considered, more complex associations become apparent. Singer (1993) reported that young women (i.e. those under 30) were at a greater risk of leaving than young men. Age and fertility have been shown to influence the career decisions of women who are in the early years of their teaching careers (Singer, 1993; Singer, 1993b; Stinebrickner, 2002). Stinebrickner (2002) found that the risks of leaving teaching were 7.83 times greater for women with a newborn child than women who did not have a newborn child. These findings suggest that higher attrition rates among young women may be related to life-cycle events such as the birth of child (Stinebrickner, 2002). Singer (1993b) points out that women who leave

teaching to parent often return to the profession after their children have become school age.

Changes in marital status also have been reported to influence teachers' career decisions. Boe et al. (1997) found that teachers who reported a change in marital status were two-times more likely to leave their positions than teachers who reported no change. Additionally, Stinebrickner (2002) reported that the risks of leaving teaching were 1.94 times greater for married women than non-married women. Research shows that the interaction between teachers' sex and other personal variables (e.g. age, fertility, and marriage) partially accounts for observed differences in the attrition behavior of men and women. This study did not examine the how the risk of attrition was influenced by the interaction between teacher's sex and other personal variables. However when asked, *what was the one thing that should have been emphasized more in your academic program?* One female graduate in the beginning stages of her career responded, "*How to prepare for balancing teaching with personal life.*" This comment is illustrative of difficulties that may lead some new teachers to leave the profession.

This study found that there were discernable differences between the risks of attrition for men and women. Furthermore, these results are consistent with the Billingsley's (1993) conceptual model that illustrates the influence that personal factors have on teachers' career decisions. Billingsley's (1993) model suggests that personal factors can directly influence teacher's decisions to leave the classroom.

Concerning the influence that teachers' ethnicity has on the risk of attrition, this study produced results that were consistent with investigations that indicate that teachers who are white have higher rates of attrition than people of color (Clewel & Villegas,

2001; Gritz & Theobald, 1996; Hanushek et al., 2004; Murnane et al., 1991). This study found that those individuals who are white have a higher risk of attrition throughout the first five years of teaching than people of color.

In this study it is difficult to account for the observed differences in the risk of attrition between whites and people of color because detailed interactions could not be explored due to limitations in the data set. Possible explanations for the observed differences reside in a growing body of research that suggests that teachers' ethnicity may influence the decision to leave the classroom through complex interactions with student characteristics (Boyd et al., 2005b; Gritz & Theobald 1996; Hanushek et al. 2004; Lobe et al. 2005). Examining data on beginning educators with five or fewer years of teaching experience, Boyd et al. (2005b) reported that White and Hispanic teachers were more likely to leave their positions as the number white students decreased and the number of Black students increased. Gritz and Theobald (1996) found that white teachers were less likely to remain working in school districts that enrolled large proportions of students of color and students who were poor. Hanushek et al. (2004) determined that white teachers were more likely to leave schools that enrolled large numbers of students of color.

Conversely, the opposite was found for teachers of color, in that these individuals tended to stay in schools with large proportions of students of similar racial backgrounds to their own (Hanushek et al., 2004). Lobe et al. (2005) reported that teachers who worked in schools that were populated by a majority of students of color were nearly three-times more likely to leave their positions than teachers that work in schools that enrolled fewer students of color. Research indicates that economically disadvantaged

schools are predominately staffed by people of color and that many economically disadvantage school districts are populated by students of color and are located in urban areas (Darling-Hammond & Sclan, 1996; Kirby et al., 1999).

This study found that there were recognizable differences between the risks of attrition for whites and people of color. Although not statistically significant, these results are consistent with the conceptual model that served as the basis for this study and with prior research. The conceptual model used in this study suggests that personal demographic characteristics such as teachers' racial background can have a direct influence on career decisions.

Research Question Three:

Interactions Among Employment Related Variables

Research question three explored possible two-way interactions between (a) teacher type (special or general education), and (b) teacher grade level (elementary or middle and secondary). The results from this study did not indicate a statistically significant interaction among employment related variables. The interpretation of this finding is that the main effects of the covariates were constant for both special and general education teachers. That is, teacher grade level did not influence the risk of attrition for special and general educators differently throughout the study period.

In the literature base, there was only one study that addressed the interaction between teacher type and teacher grade level. The study found that teachers working at the elementary level remained in the classroom an average of 1.6 years longer than those working at the secondary level (Singer, 1993). In addition, Singer (1993) reported that the risk of leaving teaching for special educators at the secondary level is the greatest during

the first-year of practice. Due to the lack of evidence concerning the influence that the noted interaction may have on the risk of attrition for beginning educators, I decided to explore this question. Clear conclusions concerning the interaction between teacher type and teacher grade level cannot be readily drawn from these findings. It is possible that the relatively low risk of attrition for special and general educators noted previously in this study counteracted any influence that the effect that teacher grade level may have had on the risk of attrition. This conclusion is tenuous, and further research is need to determine if teachers' grade level influences the risk of attrition for special and general educators differently.

Research Question Four:

Interactions Between Personal and Employment Variables

Research question four explored possible two-way interactions between (a) teacher sex (male or female), and (b) teacher grade level (elementary or middle and secondary). The results from this study did not produce a statistically significant interaction between personal and employment variables; therefore main effects of the covariates were constant for both male and female teachers. That is, teacher grade level did not influence the risk of attrition for males and females differently throughout the study period.

Billingsley's (1993) model suggests that personal and employment factors interact to influence teachers' career decisions. In alignment with Billingsley's model, there was some evidence in the research base that suggests that the interaction between teacher sex and teacher grade level influences the risk of attrition. Specifically, Theobald (1990) reported that working at the elementary level was positively associated with the decision

to stay in the classroom among women. For these reasons I decided to explore this research question. Direct interpretations of the interaction between teacher sex and teacher grade level in this study cannot be made. As mentioned previously, women in this study had a higher risk of attrition than men; therefore it may be possible that the overall higher risk of attrition among women could offset the influence of teacher grade level. This conclusion is debatable, and further research is necessary to determine if there is a plausible interaction between teacher sex and teacher grade level.

Implications for Practice and Research

The findings from this study point to several practical implications for the amelioration of teacher attrition in both special and general education. Practical implications include (1) adequately preparing teachers with the knowledge and skills that they will need to serve all students, (2) providing beginning teachers with comprehensive systems of social support, and (3) designing policy solutions to address the problem of teacher attrition.

First, Billingsley's (1993) model suggests that the knowledge and skills that teachers acquire through professional preparation contribute significantly to their ability to secure and maintain employment. The research literature reports that strong professional preparation of teachers' leads to increased employment duration (Darling-Hammond & Sclan, 1996). This study found that special education teachers had lower risks of attrition than previously reported in other investigations. General education teachers also had moderately low risks of attrition during the early years of career engagement. This means that individuals in this study were mostly successful and securing and maintaining employment as teachers early in their careers.

The prevention of teacher attrition should begin with the bolstering of the knowledge and skills that educators utilized to engage in the practice of teaching. One way to support the acquisition of such skills is to improve the quality of teacher training programs. Special and general educators alike need to be prepared in rigorous professional training programs that are squarely aligned with empirically proven pedagogical practices. For example, individuals who are preparing to work as special educators at the middle and secondary levels should have a comprehensive academic and practical experience that prepares them to address the transition needs of students with disabilities. All teachers should be adequately prepared to appropriately address the learning needs of students from diverse ethnolinguistic and economic backgrounds. Ultimately if teachers are better prepared to serve all students, parents, policy makers and researchers should expect to see improved academic and social outcomes for children and youth with and without disabilities.

Second, following professional preparation, beginning educators need to be provided with comprehensive social supports regardless of their teaching specialty, grade level, or personal characteristics. Research has shown that mentoring programs are a proven method for decreasing teacher attrition (Smith & Ingersoll, 2004). In their first year of teaching beginning educators should be paired with a veteran teacher who acts as a mentor (Smith & Ingersoll, 2004). Mentors have the ability to help new teachers to become established in their practice through guidance on issues that range from behavior and classroom management to how to appropriately accessing support from school administrators.

To better address the costs imposed on states and school districts by teacher attrition, state departments of education should consider investing in data collection systems to monitor teacher attrition. Investments in such infrastructure could lead to targeted policy interventions for school districts and schools that may have a particularly difficult time retaining beginning teachers. For example, if school districts could clearly identify the need for improved retention efforts based on data related to teacher attrition, they could possibly apply for grant funding to create mentoring programs in schools where such programs previously did not exist. Policy solutions to the problem of teacher attrition should be tailored to state and local needs and also should be informed by data collected for that purpose. Data collected specifically for this purpose would allow policy recommendations to be made based on a cost-benefit perspective that is informed by strong empirical data.

This study suggests several directions for future research in the area of teacher attrition. First, future studies should examine samples that are sufficiently large to allow for generalization of findings. Although this study contained a substantial number of observations, the lack of data in some instances limited the generalizeability of results. For example this study contained relatively few special educators compared to general educators. Second, future studies should utilize samples with larger proportions of special educators for the purpose of drawing more accurate comparisons. Larger sample sizes in future studies would also allow researchers to examine interactions among key variables more thoroughly. This study should be replicated with a larger sample to increase the likelihood that statistically significant results would be found, and thereby validate the underlying patterns of risk that were identified.

The third implication for research is related to the design of future studies. This study utilized a cross-sectional research design. In this study teacher attrition was only measured at three points in time (e.g. 1, 3, and 5-years following professional preparation) and therefore does not permit the examination of long-term patterns of attrition for special and general educators. Future studies in this area of research should examine long-term longitudinal data for beginning educators to determine when the risk of attrition is the most pronounced and when it subsides. This would allow researchers to focus their efforts on specific time periods in which interventions could be implemented to curb teacher attrition. This study primarily relied on quantitative data. In addition to quantitative data, future examinations of teacher attrition should use in-depth qualitative interviews with teachers. The use of mixed-method studies in the future could lead to a more complete view of the factors that contribute to teachers' decisions to leave the classroom.

Fourth, future research should be clearly conceptualized using a testable theoretical model. Although Billingsley's (1993) model provides a strong basis for inquiry, future studies should work to refine this model so that functional relationships between key model components can be more precisely identified. For example, Billingsley's (1993) model does not specify relationships between "*external*" (e.g. economic and societal variables) and "*personal*" (e.g. ethnicity and gender) factors. Research elsewhere suggests that personal factors such as ethnicity, gender, and socioeconomic status can mediate a person's access to labor markets and social networks (Lent et al., 1994). Future studies should seek to refine Billingsley's (1993) model and by doing so expand what is known about the causes of teacher attrition.

Fifth, future research in this area of study could be advanced through studies that focused on the social environment of teaching. Specifically, researchers should consider how teacher/student and parent/teacher relationships influence teachers' career decisions. Related to developing research that addresses the influence that the social environment of teaching may have on teachers' career decisions, researchers should continue to examine topics such as teacher stress and teacher self-efficacy. Research could also benefit from a better understanding of beginning teachers' commitment to the profession and how their commitment may change over time.

The final implication for research involves focusing on geographic differences in patterns of teacher attrition. Currently, there is a pronounced lack of research that addresses patterns of teacher attrition in special and general education based on geographic locations or regions of the country. To date research has generally focused on the problem of teacher attrition in urban settings, yet specific comparisons between urban areas with similar demographic characteristics have not been conducted. Additionally, there are no studies that have examined regional variations in the occurrence of teacher attrition. In the future, investigations should focus on how patterns of attrition vary by geographic location. If researchers could determine which portions of country are the most affected by teacher attrition resources could be targeted to systematically address the problem through a cost-benefit perspective.

Conclusion

This study found that employment and personal demographic variables produced patterns of risk that were largely consistent with previous investigations of teacher attrition in special and general education. Although the results of this study were not

statistically significant, the patterns of risk that were found point to the importance that employment and personal factors have in influencing the career decisions of beginning teachers. Teacher attrition continues to be a significant problem that threatens student achievement and the health of school systems. The first step in ensuring that all students have equal access to high quality academic and social learning opportunities is to create a well prepared and stable teaching work force in partnership with researchers, parents, school administrators, and policy makers. Taking such an approach will ultimately strengthen the public education system and improve the academic and social outcomes experienced by all children.

APPENDIX A
REVIEWED RESEARCH LITERATURE FOR TEACHER ATTRITION

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Adams (1996)**	To study teacher attrition among first-year urban educators	Longitudinal	n = 2,327		√	√	<ul style="list-style-type: none"> • Women, white teachers, and young teachers were at higher risk for attrition. • Traditionally certified teachers were at a higher risk for attrition.
Boe, Cook, & Sunderland (2008)***	To quantify trends in teacher attrition	Longitudinal	n = 14,344		√		<ul style="list-style-type: none"> • Special educators leave at higher rates than general educators.
Boe, Bobbitt, & Cook (1997)***	To study teacher attrition from a national prospective	Longitudinal	n = 4,798		√		<ul style="list-style-type: none"> • Special educators leave at higher rates than general educators.
Boe, Bobbitt, Cook, Whitener, & Weber (1997)***	To study teacher attrition from a national prospective	Longitudinal	n = 4,798		√	√	<ul style="list-style-type: none"> • Teacher attrition decreased as teacher age, number of dependent children, level of certification, increased.
Billingsley, Pyecha, Smith-Davis, Murray, & Hendricks (1995)***	To examine the reasons why teachers left their positions	Longitudinal	n = 470		√	√	<ul style="list-style-type: none"> • Teachers lacking supportive work environments were at higher risk for attrition. • Women and white teachers left the classroom at higher rates.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Boyd, Lankford, Loeb, & Wyckoff (2005a)**	To determine if the implementation of state-mandated testing increased teacher attrition	Longitudinal	n = 359,962	√			<ul style="list-style-type: none"> Attrition rates decreased with the implementation of state-mandated testing.
Boyd, Lankford, Loeb, & Wyckoff (2005b)**	To study New York City elementary school teachers' career decisions in their first 5-years of practice	Longitudinal	Population of New York elementary school teachers	√		√	<ul style="list-style-type: none"> Teachers who had prior homes further away from their jobs were more likely to move and leave. White and Hispanic teachers were more likely to leave schools as the proportion of white students decreased and the proportion of black students increased.
Brewer (1996)**	To examine the relationship between teachers' salaries and the decision to quit teaching	Longitudinal	n = 5,458		√		<ul style="list-style-type: none"> Teacher attrition decreased for women as salaries increased. Increased teacher attrition was associated with low pay and alternative for higher paying employment in nearby school districts.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Brownell, Smith, McNellis, & Lenk (1994-1995)*	To determine the factors that contribute to special educators career decisions	Retrospective	n = 24		√	√	<ul style="list-style-type: none"> Teacher characteristics and workplace conditions influenced teachers' career decisions. Certification status was associated with attrition.
Brownell, Smith, McNellis & Miller (1997)*	To understand why special educators left their positions	Retrospective	n = 93		√		<ul style="list-style-type: none"> Special education teachers left their positions because they were dissatisfied with their working conditions. Certification status was associated with attrition.
Clewell & Villegas (2001)**	To evaluate the effectiveness of a program designed to produce teachers for high needs schools	Longitudinal	n = 2,593			√	<ul style="list-style-type: none"> Attrition rates were the lowest for people of color. Whites were more likely to work in suburban and rural schools and people of color were more likely to work in urban settings.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Edgar & Pair (2005)*	To examine the career paths of special educators	Retrospective	n = 161		√		<ul style="list-style-type: none"> The majority of special educators remained in the teaching profession during the six years studied.
Gritz & Theobald (1996)***	To investigate how differences in public school districts' spending priorities affect teacher attrition	Longitudinal	n = 9,756 teachers	√	√	√	<ul style="list-style-type: none"> Teachers have shorter tenures in school districts that spend more on administrative and nonteaching positions. Female teachers stay in their positions longer when salaries increase relative to other salaries available in other local employment. Men stay in their positions longer when teachers are paid more across the state. Teachers are less likely to stay in districts that enroll high proportions of students of color and students living in poverty.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Hanushek, Kain, & Rivkin (2004)**	To examine the influence that student demographic characteristics and salaries have on teacher attrition	Retrospective	n = 378,790	√	√	√	<ul style="list-style-type: none"> Teachers were less likely to stay in schools that enrolled high proportions of students of color, students living in poverty, and students with low test scores. White teachers were less likely to stay as the proportion of Black and Hispanic students in a school increase. The exact opposite was found for Black and Hispanic teachers.
Henke, Chen, Geis, & Kenpper (2000)***	To examine new teachers employment trajectories	Longitudinal	n = 11,200		√		<ul style="list-style-type: none"> Individuals with higher standardized test scores were more likely to leave.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Imazeki (2005)***	To examine teacher labor mobility within and out of the teaching profession	Longitudinal	n = 1,175	√	√	√	<ul style="list-style-type: none"> • Increased salaries were associated with decreased attrition. • Teachers work assignments were associated with higher risks of attrition. • Student racial characteristics influence teachers' decisions to leave.
Ingersoll (2001)***	To investigate factors that influence teacher attrition	Longitudinal	n = 6,733		√	√	<ul style="list-style-type: none"> • Teacher characteristics and work assignments were associated with attrition. • Teachers working in schools with higher salaries, greater levels of administrative support had rates of attrition.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Johnson & Birkeland (2003)**	To understand the reasons why beginning teachers either quit or remained in the teaching profession	Longitudinal	n = 50		√	√	<ul style="list-style-type: none"> • Teacher who felt successful with students, supported by administrators, and had opportunities for collegial interaction were more likely to stay in their positions. • Men had higher rates of attrition. • Teachers who were committed to their practice were more likely to stay.
Kirby, Berends & Naftel (1999)**	To examine the supply and demand of teachers of color	Longitudinal	n = 98,952		√	√	<ul style="list-style-type: none"> • Teacher characteristics were associated with attrition. • Low salaries and difficult working conditions contributed to higher rates of attrition.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Loeb, Darling-Hammond & Luczak (2005)	To examine the influence of school conditions and demographic factors on teacher attrition	Retrospective	n = 1,071	√	√		<ul style="list-style-type: none"> Higher levels of attrition were associated with poor work conditions, low salaries, and student characteristics.
Lukens, Lyter & Fox (2004) ***	To examine teacher attrition from a national prospective	Longitudinal	n = 8,400	√	√	√	<ul style="list-style-type: none"> Teacher characteristics were associated with attrition. Work related factors were related to attrition. Student characteristics were associated with attrition.
Marso & Pigge (1997)**	To investigate teacher persistence in their chosen career	Longitudinal	n = 551			√	<ul style="list-style-type: none"> Individuals' initial commitment to becoming a teacher predicted long term employment.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Marvel, Lyter, Peltola Strizek & Morton (2007)***	To examine teacher attrition from a national perspective	Longitudinal	n = 7,429	√	√	√	<ul style="list-style-type: none"> Teacher attrition was the highest among young teachers and those of retirement age. Special educators had the highest rates of attrition compared to other teachers. Schools that enrolled large proportions of students of color had the highest rates of attrition
Miller, Brownell & Smith (1999)*	To investigate the factors that predict special educators decisions to stay and leave	Retrospective	n = 1576		√	√	<ul style="list-style-type: none"> Special educators left their positions due to insufficient certification, perceptions of high stress, and perceptions of poor school climate.
Mont & Rees (1996)**	To investigate the effects of classroom characteristics on high school teacher attrition	Retrospective	n = 525		√		<ul style="list-style-type: none"> Teachers who taught classes outside of their area of expertise had higher levels of attrition.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Morvant, Gersten, Gillman, Keating & Blake (1995)*	To understand why special educators left their positions	Retrospective	n = 17		√		<ul style="list-style-type: none"> Teachers who did not felt supported and those who felt overburdened in their jobs left their positions.
Murnane, Singer, Willett, Kemple & Olsen (1991). **	To examine the factors that place teacher at risk for attrition	Longitudinal	n = 16,579		√	√	<ul style="list-style-type: none"> Teachers were most likely to leave early in their careers. White teachers were more likely to leave than teachers of color. Secondary teachers left sooner than elementary teachers. Teachers with high test scores had shorter teaching careers. Teachers who had low pay left quickly. Women left at higher rates than men.
Platt & Olson (1990)*	To determine why special educators left their positions		n = 76				<ul style="list-style-type: none"> Special educators left teaching due to excessive paperwork and a lack of administrative support.
Podgursky, Monroe & Watson (2004)**	To investigate the academic quality of the teaching workforce	Longitudinal	n = 3,963		√		<ul style="list-style-type: none"> Teachers with high standardized test scores were more likely to leave their positions.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Rickman & Parker (1990)**	To investigate the effect that wages have teachers' decisions to leave the teaching profession	Retrospective	n = 636		√		<ul style="list-style-type: none"> Lower salaries were associated with higher rates of attrition.
Scafidi, Sjoquist & Stinebrickner (2007)***	To examine the influence of student characteristics on teachers' decisions to leave their positions	Retrospective	Population of Georgia elementary school teachers		√	√	<ul style="list-style-type: none"> The interaction between teacher and student characteristics predicted attrition.
Shen (1997)**	To investigate the factors that influence teacher attrition	Retrospective	n = 3,612	√	√		<ul style="list-style-type: none"> Teacher attrition was high for inexperienced, low paid teachers. Teachers working with large numbers of students of color and students who were poor had high levels of attrition. Teachers that perceived that administrators were supportive tended to have longer tenures than those not feeling supported.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Singer (1993)	To determine the risk associated with the length of time spent teaching special education	Longitudinal	n = 6,600		√	√	<ul style="list-style-type: none"> Beginning teachers, young women, and those with high test scores were the most likely to leave teaching.
Smith & Ingersoll (2004)**	To examine whether induction programs have a positive effect on beginning teachers retention rates	Longitudinal	n = 3,235	√	√		<ul style="list-style-type: none"> Having a mentor inside of ones field was associated with a decreased risk of attrition. Collaborative activities with other teachers reduced the risk of attrition. Teachers working in high-poverty schools were at increased risk for attrition.
Stinebrickner (1998)**	To examine the influence of demographic and school characteristics on beginning teachers' career decisions	Longitudinal	n = 341		√	√	<ul style="list-style-type: none"> Higher wages decrease the risk of attrition. Marriage increased the risk of attrition for both men and women. Having a child decreased the risk of attrition for both men and women.



Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Stinebrickner (2002)**	To examine both the timing and reasons for teachers' leaving their positions.	Longitudinal	n = 1,450			√	<ul style="list-style-type: none"> • Women leave teaching at higher rates. • Having a newborn child was the single greatest predictor of leaving for women.
Stockard & Lehman (2004)**	To examine the influences of teacher and school characteristics on satisfaction and retention of teachers in their 1st year of employment	Retrospective	n = 379	√	√		<ul style="list-style-type: none"> • Teachers who lived in small towns were more likely to leave teaching. • Higher salaries were associated with lower rates of attrition. • Job satisfaction was lower for teacher who left the profession.
Texas Teacher Retention, Mobility, and Attrition (1995)**	To investigate the careers of beginning teachers	Retrospective	n = 10,381		√	√	<ul style="list-style-type: none"> • Lower salaries were associated with decisions to leave teaching. • Young and inexperienced teachers had increased levels of attrition gender were associated with attrition.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Theobald (1990)**	To quantify the relationship between teacher, school district characteristics and teacher retention behavior	Retrospective	n = 37,321		√	√	<ul style="list-style-type: none"> Higher salaries were associated with decisions to remain teaching especially for men. Young inexperienced teachers were more likely to leave. Teaching assignment at the elementary level was positively associated to the decision to stay among women.
Whitener, Gruber, Lynch, Tingos, Perona, & Fondelier (1997)**	To investigate the careers of beginning teachers	Longitudinal	n = 5,075		√	√	<ul style="list-style-type: none"> Young and inexperienced teachers had increased levels of attrition. Women had higher rates of attrition than men. Secondary teachers had higher rates of attrition than elementary teachers.

Study Citation	Purpose	Type of Study	Sample	Explanatory Factors			Results
				External	Employment	Personal	
Williams (2004)*	To examine external and internal factors that contribute to special education teacher attrition	Retrospective	n = 37,642	√		√	<ul style="list-style-type: none"> Teachers working in high poverty schools had higher rates of attrition. Men and women had comparable rates of attrition. People of color had higher rates of attrition than whites.

Note. *Sample contained only special educators; ** Sample contained only general educators; ***Sample contained both special and general educators.

APPENDIX B
STUDENT FOLLOW-UP SURVEY INSTRUMENT



 Graduation Year _____ UO DEG _____

Draft **Start Here:** Seq1 _____

1. From which program did you graduate? (MARK ONLY ONE)

EDUCATIONAL LEADERSHIP

- Administrative Licensure
- Policy, Management, & Organization
- Learning Assessment Systems and Performance

TEACHER EDUCATION

- Educational Foundations
- Graduate Elementary Teaching (GET)
- Middle/Secondary
- ESOL (Only)
- ESOL/Bilingual (Only)
- Integrated Teaching
- Music Education

SPECIAL EDUCATION

- Communication Disorders and Sciences
- Early Intervention
- School Psychology
- Special Education
- Early Childhood/Elementary
- Middle/Secondary Transition

COUNSELING AND HUMAN SERVICES

- Counseling Psychology
- Family and Human Services
- Marriage and Family Therapy

2. Are you currently employed in the *educational or social service field*?


YES → (Skip to Question 4 and Complete the Survey)
 NO → (Please Answer Question 3 and Question 11 through 17 and Complete the Survey)

3. If you are *not currently employed in the educational or social service field* please select the option that best describes your situation.

- Working in another field
- Enrolled in school/training in the educational or social science
- Not Interested in working in the field
- Don't have the necessary skills or certification
- Can't find a job in education or social services where you live
- Enrolled in school/training in a field other than educational or social science
- Family obligations preclude working at this time
- Other _____

4. What *kind* of job is it? (MARK ONE OPTION)

- Regular education teacher-elementary
- Regular education teacher-middle/secondary
- Special education teacher-elementary
- Special education teacher-middle/secondary
- Educational aide
- School administrator
- School psychologist
- Speech language pathologist
- Counselor/psychologist
- Counselor/university professor
- Staff in a social service agency
- Other _____

CONTINUE → 



Draft

Graduation Year _____

UO DEG _____

Seq2 _____

5. **How long have you held this job?**

- Less than 1 year 1 to 2 years more than 2 years

6. **Are you working full-time in this job?**

- Yes No

7. **How well did the courses in your program prepare you for this job?**

- Very Well Well Poorly Very Poorly

8. **Did you have supervised field experience or practicum in your program?**

- YES → (Please Answer Question 9)
 NO → (Skip to Question 10)

9. **How well did the practicum experience in your academic program prepare you for this job?**

- Very Well Well Poorly Very Poorly

10. **How well did your academic program prepare you to work with persons from diverse backgrounds in this job?**

- Very Well Well Poorly Very Poorly

11. **Do you have a disability for which you received an accommodation in your academic program?**

- Yes No

12. **During your tenure at the College of Education were you an international student?**

- Yes No

13. **What is your gender?**

- Male Female

14. **Are you LGBTQ?**

- Yes No

15. **What is your Race/Ethnicity? (MARK ALL THAT APPLY)**

- White
 Black or African American
 Asian
 American Indian or Alaska Native
 Native Pacific or Pacific Islander
 Hispanic or Latino
 Multiracial
 Other _____

CONTINUE →

**Please answer the following questions regarding YOUR experience in YOUR ACADEMIC PROGRAM.*

16. What was the *most valuable thing* you learned in your academic program?

17. What was the *one thing that should have been emphasized more* in your academic program?

STOP HERE

THANK YOU FOR COMPLETING THE SURVEY!

APPENDIX C
DEMOGRAPHIC CHARACTERISTICS OF THE SFS SAMPLE

Demographic characteristics	SFS Sample		2002 Graduates		2004 Graduates		2006 Graduates	
	n	%	n	%	n	%	n	%
Participant sex								
Male	108	19	28	17	29	16	51	22
Female	465	81	135	83	148	84	182	78
Valid n	573	100%	163	100%	177	100%	233	100%
Missing data	1	0.20%	1	0.20%				
Participant Ethnicity								
Person of color	84	15	27	17	22	13	35	15
White	481	85	133	83	150	87	198	85
Valid n	565	100%	160	100%	172	100%	233	100%
Missing data	9	1.60%	3	1.80%	5	2.80%	1	0.40%
Disability status								
Yes	11	2	1	2	2	2	8	3
No	557	98	158	98	174	98	225	97
Valid n	568	100%	160	100%	176	100%	233	100%
Missing Data	6	1%	4	2.40%	1	0.60%	1	0.40%
International status								
Yes	20	3	8	5	4	2	8	4
No	550	97	154	95	172	98	224	96
Valid n	570	100%	162	100%	176	100%	232	100%
Missing data	4	0.70%	1	0.60%	1	0.60%	2	0.90%
Lesbian or gay								
Yes	21	4	7	6	8	5	6	3
No	486	96	120	94	151	95	215	97
Valid n	507	100%	127	100%	159	100%	221	100%
Missing data	67	12%	36	22%	18	10%	13	5.50%

Demographic characteristics	SFS Sample		2002 Graduates		2004 Graduates		2006 Graduates	
	n	%	n	%	n	%	n	%
Degree level								
Undergraduate	156	27	25	15	48	27	83	35
Graduate	418	73	138	85	129	73	151	65
Valid n	574	100%	163	100%	177	100%	234	100%
Missing data								
Preparation								
Education	425	74	123	75	127	72	175	75
Social services	149	26	40	25	50	28	59	25
Valid n	574	100%	163	100%	177	100%	234	100%
Missing data								
Teacher type								
Special Ed.	39	18	14	23	9	15	16	16
General Ed.	187	82	50	77	51	85	86	84
Valid n	226	100%	65	100%	61	100%	102	100%
Missing data	347	60%	98	60%	116	66%	132	56%
Teacher grade level								
Elementary	125	56	31	48	34	56	60	61
Middle/secondary	101	44	34	52	27	44	40	39
Valid n	226	100%	65	100%	61	100%	100	100%
Missing Data	347	60%	98	60%	116	66%	132	56%
Employed								
Yes	476	83	135	83	151	85	190	81
No	98	17	28	17	26	15	44	19
Valid n	574	100%	163	100%	177	100%	234	100%
Missing data								
Full time								
Yes	420	86	117	85	137	88	166	86
No	67	14	20	15	19	12	28	14
Valid n	487	100%	137	100%	156	100%	194	100%
Missing data	87							

Demographic characteristics	SFS Sample		2002 Graduates		2004 Graduates		2006 Graduates	
	n	%	n	%	n	%	n	%
Employed as teacher								
Yes	252	53	62	46	78	52	112	59
No	224	47	74	54	71	48	79	41
Valid n	476	100%	136	100%	149	100%	191	100%
Missing data	98	17%	26	16%	21	12%	40	17%
Employed in education non-teaching								
Yes	141	46	46	51	38	47	57	43
No	165	54	45	49	43	53	77	57
Valid n	306	100%	91	100%	81	100%	134	100%
Missing data	268	47%	72	44%	96	54%	100	43%
Employed in social services								
Yes	165	54	45	49	43	53	77	43
No	141	46	46	51	38	47	57	57
Valid n	306	100%	91	100%	81	100%	134	100%
Missing data	268	47%	72	44%	96	54%	100	43%
Reasons for unemployment								
Working in a different field.	17	18	5	18	5	19	7	16
Further education in the field.	29	30	2	7	8	30	19	45
No interest in working in the field.	4	4	-	-	1	4	3	7
Don't have skills	1	1	1	4	-	-	-	-
Can't find work.	12	12	3	11	2	7	7	16
Further education in other field.	7	7	2	7	2	7	3	7
Parenting	21	21	12	43	6	22	3	7
Other	7	7	3	10	3	11	1	2
Valid n	98	100%	28	100%	27	100%	43	100%
Missing Data	476	83%	135	83%	150	85%	191	82%

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