ABSTRACT

Title of Dissertation:	A PROFILE OF THE QUALIFICATIONS OF SPECIAL EDUCATION TEACHERS AMONG HIGH POVERTY, URBAN, AND RURAL SCHOOLS
	Loretta Marie Mason, Doctor of Philosophy, 2008
Directed By:	Professor Peter Leone Department of Special Education

The purpose of this study was to provide a descriptive profile of the special education teachers in the SASS:04 sample and to examine how the qualifications of special education teachers varied among K-12 public schools according to the urbanicity or proportion of students in poverty within a school. Variables related to teacher qualifications, demographic characteristics, teaching positions, and school characteristics were identified from the 2003-04 Schools and Staffing Survey database. Descriptive bivariate statistics and logistic regression analysis were used in this study.

The findings demonstrated statistically significant differences in the qualifications of special educators among many of the subgroups analyzed. The analysis by

demographic characteristics revealed that minority group members, younger special educators, and male special educators were less qualified than other special education teachers. Inspection of qualifications by school level and teaching assignment also found statistically significant differences. The investigation of the qualifications of special educators by poverty quartiles and by urban areas revealed a statistically significant relationship between qualifications and the type of school analyzed.

The findings emphasize the need to provide targeted interventions to promote supplying all schools with qualified special education teachers. The findings also indicate that qualified special education teachers may not be equitably distributed and that further work in this area is necessary.

A PROFILE OF THE QUALIFICATIONS OF SPECIAL EDUCATION TEACHERS
AMONG HIGH POVERTY, URBAN, AND RURAL SCHOOLS

By

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Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2008

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DEDICATION

For all my friends and family who were always eager to provide food, drink, and

support throughout this long process, especially:

Jamie, My Parents, Polly, and Joe-

I never could have done it without you.

ACKNOWLEDGEMENT

"I not only use all the brains that I have, but all that I can borrow."

-Woodrow Wilson

Over the past five years, I borrowed countless brains, many of which I would like to thank here. During my stay at the University of Maryland I had the pleasure of working with many individuals who provided me with encouragement, wisdom, and sometimes just a good laugh. I thank them for both the professional opportunities and the personal kindness. I especially want to thank my committee members for the never-ending edits, revisions, and helpful feedback. A special thanks goes to my mentors, including Polly, Joe, Deb, Maggie, and Peter. Although I may not have always listened, I tried to admit that you were ALWAYS right.

I want to thank the office staff in the Department of Special Education for remaining patient with me and assisting me with whatever I needed. I would like to thank the EDJJ members near and far- Chinese food, Cole Field House, Tempe Mission Palms, and room 1224 will always hold a place in my heart. To my dissertation support team, including Meredith, Amanda, Sarika, Kelly, Mark, Mike, and Asha- thank you for cheering for me, listening to me, and laughing with me.

Of course, no acknowledgement section would be complete without mention of friends and family. Jamie, I will never be able to thank you enough for your support of my career and aspirations. Mom, Dad, Patts, Rock, and Davey, as well as my extended family, thank you for your continual encouragement, even when it seemed like the process would never end. To Erin, the Tomasini's, Traci, and my Mother's family, thank you for always listening even when I bored you to tears with details of my coursework and dissertation efforts.

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LIST OF ABBREVIATIONS

ARC- Alternative Routes to Certification
CCD- Common Core of Data
CSPR- Consolidate State Performance Report
DANS- Data Analysis System
ECS- Education Commission of the States
ESEA- Elementary and Secondary Schools Act of 1965
HEA-Higher Education Act of 1965
HQT- Highly Qualified Teachers
HQSET- Highly Qualified Special Education Teachers
IDEA 2004- Individuals with Disabilities Education Improvement Act of 2004
IES- Institute for Education Statistics
IHE- Institutes of Higher Education
NCATE- National Council for Accreditation of Teacher Education
NCCTQ- National Comprehensive Center for Teacher Quality
NCES- National Center for Education Statistics
NCLB- No Child Left Behind Act of 2001
OSEP- Office of Special Education Programs
SASS- Schools and Staffing Survey
SPeNSE- Study of Personnel Needs in Special Education
TFS- Teacher Follow-Up Survey
TLF- Teacher Listing Form
USDOE- United States Department of Education

CHAPTER I

Introduction

Every student deserves a quality teacher. Stakeholders agree that a quality teacher is the most valuable resource provided to a student, but disagree as to how to define or prepare a teacher to meet this standard (Rice, 2008; Corcoran, 2007). The debates range from the value of teacher certification requirements and pre-service preparation options to the measurement of teacher effectiveness in the classroom. The research that has been done is highly contested and often relied on qualification measures with only limited statistical significance, rather than direct measures of effective teaching (Rice). In spite of this, current policy initiatives define teacher quality from the perspective that having certain credentials is important to student academic achievement (Cochran-Smith & Fries, 2005; Corcoran; Dwyer, 2007). In special education, very little empirical research has been done to define a quality special educator, and in the absence of research policymakers are forced to rely on evidence from the general education research.

Regardless, the distribution of quality teachers is inequitable and not all students have such teachers. This problem is especially prevalent in schools with high proportions of poor, minority, and non-English speaking children (Clotfelter, Ladd, Vigdor, & Wheeler, 2007a; Goe, 2002; Iatorola & Stiefel, 2003; Lankford, Loeb, & Wyckoff, 2002; Peske & Haycock, 2006). This is troublesome as evidence suggests that, "poor children, minority children, and children from non-English speaking homes are even more dependent on the quality of their teachers than are more affluent, English-speaking, White children" (Corcoran, 2007, p. 1). Many urban and rural school administrators report struggling to find qualified teachers to fill vacant positions, often instead relying on teachers with little or no preparation for the position available (Recruiting New

Teachers, Inc., 2000; Schwartzbeck & Prince, 2003; Southeast Center for Teaching Quality, 2004). This problem appears to be especially pervasive in special education where chronic teacher shortages and attrition complicate achieving the goal of a qualified teacher for all students with disabilities (Billingsley, 2004b; Boe, 2006; Katsiyannis, Zhang, & Conroy, 2003).

Defining teacher quality and the distribution of qualified teachers are at the core of the problem addressed in this research. In this chapter, I first discuss the difficulty with defining teacher quality in general and special education research, as well as how teacher quality is defined by federal policy. Next, the problems associated with providing a qualified teacher to all students, especially those with a disability, are discussed. Research gaps are then identified and the chapter concludes with a statement of purpose, the guiding research questions, and the terminology used in this study.

Defining Teacher Quality

Educational researchers and policymakers continue to deliberate on the definition of teacher quality, the value of teacher preparation, and the need for certification (Podgursky, 2005). In spite of the ambiguity, federal policymakers chose to define teacher quality in terms of specific qualifications in the No Child Left Behind Act (NCLB, P.L. 107-110) and the Individuals with Disabilities Education Improvement Act of 2004 (IDEA 2004, P.L. 108-446). The following sections provide an overview of the problem in defining teacher quality in general and special education.

General Education Teacher Quality Research

Researchers define teacher quality by either teacher qualifications (the experience and preparation a teacher brings to the classroom) or student outcomes (the effectiveness

of a teacher to raise student academic achievement while in the classroom; Cochran-Smith & Fries, 2005; Goe, 2007). Multiple reviews of the literature pertaining to the role of teacher qualifications have reported competing and contradictory findings regarding the value of experience and preparation as well as their effect on student academic achievement (Darling-Hammond, 1999; Goe; Rice, 2003; Wayne & Youngs, 2003). Studies have examined variables such as holding certification in teaching, completing a teacher preparation program, attending a selective college or university, scoring well on the Scholastic Achievement Test (SAT), and teaching experience. While certification, content area expertise, and teaching experience were found to sometimes make a difference, insufficient sample sizes and weak methodologies hindered generalizing the findings and defining teacher quality (Cochran-Smith & Fries; Rice; Wayne & Youngs). The reviews found that in cases where a particular variable mattered, such as certification or experience, the sample investigated included only a particular group of teachers, such as secondary math teachers, thus limiting the ability to generalize findings to other subject areas and grade levels. Furthermore, critics of policies that rely on teacher inputs to define teacher quality point out that simply possessing the certificate or degree does not guarantee an effective teacher (Corcoran, 2007; Darling-Hammond, 2000a; Goldhaber & Brewer, 2000).

A second category of studies utilizes student outcome measures to define teacher effectiveness. Student outcomes are measured by gains a student makes on a standardized state or national exam (i.e., Clotfelter, Ladd, & Vigdor, 2007a; Kupermintz, 2003; Nye, Konstantopoulos, & Hedges, 2004; Rowan, Correnti, & Miller, 2002; Sanders & Horn, 1994; Sanders & Rivers, 1996). Research conducted in this manner estimates the gains in

a student academic achievement in relation to being taught by a teacher who possesses certain qualifications such as certification and demonstrated subject knowledge (Corcoran, 2007; Cochran-Smith & Fries, 2005). However, these studies do little to inform policy as to how to prepare teachers to be effective and may underestimate the classroom or school effects on student learning (Goe, 2007). Taken together, the research on teacher qualifications and teacher effectiveness, while providing some valuable insight into what a qualified teacher might look like, remains inconclusive.

Special Education Teacher Quality Research

Unlike the research in general education, special education has focused more on teacher *quantity* than on teacher *quality* (Blanton, Sindelar, & Correa, 2006; Boe, Cook, Bobbitt, & Terhanian, 1998). These studies use attributes like in-field certification and years of experience to address the problem of teacher shortages and attrition. For example, studies have found that special educators with preparation, experience, and certification in special education stay in the field longer (Billingsley, 2004b; Boe, 2006; Boe, Bobbitt, Cook, Whitener, & Weber, 1997). The limited number of studies that do attempt to define teacher quality in special education often rely on self-reported, perceived competence (Boe, Shin, and Cook, 2007; Carlson, Lee, & Schroll, 2004; Goe and Coggshall, 2007). No studies in special education attempt to understand the connection between teacher qualifications and student outcomes. Regardless of the soundness of the research base, current federal educational policies set a definition for what constitutes a qualified teacher in general and special education.

Federal Policy and Teacher Quality

Two major federal laws contain definitions of a qualified teacher: NCLB and the IDEA 2004 amendments. In the absence of a clear definition for teacher quality, policymakers chose to focus on teacher qualifications. The 2001 amendments to the Elementary and Secondary Schools Act (ESEA) (NCLB) of 1965 included specific provisions defining a Highly Qualified Teacher (HQT). The provisions defined in Section 9101 of the ESEA apply to all teachers of core academic subjects in local education agencies (LEA) provided funding through Title I of the Act. To be highly qualified, a teacher must have at a minimum a bachelor's degree, demonstrated content area expertise (i.e., having an undergraduate or graduate major in the content area or passing a state-determined exam), and hold full state certification (Title I- Improving the Academic Achievement of the Disadvantaged, 2002). The HQT provisions further required all states to monitor progress towards providing all students with a teacher meeting these standards (Title I- Improving the Academic Achievement of the Disadvantaged). Providing all students with teachers meeting the HQT standard is a central focus of the NCLB and is considered paramount to meeting the nation's goal of an equitable educational system.

Aligning closely with NCLB, the IDEA 2004 amendments reinforced that all special educators should be held to the HQT provisions (Assistance to States for the Education of Children with Disabilities and Preschool Grants for Children with Disabilities, 2006). The final regulations accompanying the IDEA defined a Highly Qualified Special Education Teacher (HQSET) as an individual with full state certification. For special educators providing instruction in a core academic subject area, "the term 'highly qualified' has the meaning given the term in Section 9101 of the

Elementary and Secondary Education Act (ESEA) of 1965" (U.S. Department of Education, n.d.). Therefore, special educators must meet the same standards as a general educator teaching a core subject area. In addition, special educators must also meet the state certification standards in special education (U.S. Department of Education, n.d.). The amendments echo the language in the NCLB- insuring all students with disabilities have access to HQSET is essential so that all students can meet high standards of academic success.

The provisions require special education teachers providing instruction in a core academic subject to demonstrate subject knowledge, either through an undergraduate or graduate major or through a state-defined exam. Special educators teaching core academic subjects exclusively to students assessed by alternate achievement standards have two options for meeting HQT: they can meet the same subject knowledge standards as other elementary, middle, or high school teachers; or they can demonstrate subject knowledge, "appropriate to the level of instruction being provided" (U.S. Department of Education, n.d.). Special education teachers teaching multiple core academic subjects can demonstrate competence in each of the subjects in the same manner as other elementary, middle, or high school teachers or by completing a single, high objective uniform state standard of evaluation (HOUSSE; U.S. Department of Education, n.d.). Demonstrating content knowledge is a persistent focus in both NCLB and IDEA 2004 as it aligns with the national focus on accountability standards for student academic achievement and the assumption that teachers must possess content knowledge to promote academic achievement.

Both the HQT and HQSET provisions are forcing states to begin monitoring the certification of teachers. The regulations to NCLB require states to, "establish annual measurable objectives for each LEA and school that include, at a minimum, an annual increase in the number of highly qualified teachers at each LEA and school" (Title I-Improving the Academic Achievement of the Disadvantaged, 2002). Plans submitted to the USDOE are to document how the state education agency is working to prevent poor and minority students from being instructed by teachers not meeting the HQT standards at higher rates than their peers. Likewise, the amendments of IDEA require states to, "take measurable steps to recruit, hire, train, and retain highly qualified personnel," (U.S. Department of Education, n.d.). Unlike NCLB, the monitoring requirements of IDEA 2004 do not require states to look differentially at schools that may be at a greater disadvantage in the process of recruiting and retaining teachers meeting the HQSET standards. In light of progress reports from states on the goals set forth by NCLB and the emerging research from general education on the uneven distribution of qualified educators an exploration of the distribution of special educators is both timely and warranted.

<div align="center">Providing Qualified Teachers to All Students</div>

As policymakers set additional standards for teacher certification and licensure, many school systems struggle with recruiting and retaining qualified teachers (Darling-Hammond & Sykes, 2003; McLeskey, Tyler, & Flippin, 2004). These problems are most noticeable in districts and schools serving a disproportionate number of students who are poor, non-white, English-language learners, or require remedial and special education programs (Darling-Hammond, 2000a, 2000b; National Partnership for Teaching in At-

Risk Schools, 2005; Southeast Center for Teaching Quality, 2004). In addition, teachers in science and math, as well as in special education and bilingual education are especially hard to recruit and retain (Billingsley, 2004b; Darling-Hammond, 2000a, 2000b; Darling-Hammond & Barry, 1999; Hanushek & Pace, 1995; White, 2004). An uneven distribution of qualified special educators impacts our nation's ability to create and equitable educational system.

Numerous research reports documented shortcomings in the distribution of teachers holding state certification, finding that in fact not all students had access to a teacher meeting state certification requirements, and providing evidence of an uneven distribution of teachers across schools (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2007; Darling-Hammond, 2000a; Goe, 2002; Iatorola & Stiefel, 2003; Thirunarayan, 2004). The uneven distribution leaves students in high minority, high poverty, and rural schools without access to a qualified teacher.

Distributing Teachers Among Schools

The uneven distribution of qualified teachers across schools can be attributed to a number of factors (Lankford, Loeb, & Wyckoff, 2002). For instance, residents of school systems may prefer more experienced teachers or teachers with a certain amount preparation. Inefficient recruiting and hiring practices, such as late vacancy postings or complicated systems of interviewing, may hinder some systems from getting the most qualified applicants. In districts with very active parents, their input may account for the sorting of teachers within a district. Last, the preferences of teachers may partially account for the sorting, as teachers may choose to work in districts with higher salaries or

in schools with more appealing characteristics such as small class size or greater availability of technology (Murnane & Steele, 2007).

Further complicating the goal of providing a qualified teacher for every classroom are reports of persistent shortages of qualified teachers. The shortages seem most apparent in specific content areas, geographic regions, or areas of specialization (Darling-Hammond & Sykes, 2003; McLeskey, Tyler, & Flippin, 2004; Westling & Whitten, 1996). The problem of providing qualified teachers to all students is particularly acute for poor and minority students, students with disabilities, and students in urban or rural school systems (Darling-Hammond & Sykes; Klingner, Harry, & Felton, 2003; National Partnership for Teaching in At-Risk Schools, 2005; Southeast Center for Teaching Quality, 2004).

Berne and Stiefel (1984, 1994) provide a framework from which to evaluate equity in schools. Originally intended as a method to judge school finance systems, the framework incorporates three standards of equity: horizontal equity, vertical equity, and equal opportunity. Horizontal equity refers to the equal treatment of equals, where all schools must be provided the same amount and type of resources. Vertical equity takes into account variation among schools and students, insisting that schools must be provided resources equivalent to their needs. Thus, schools with higher proportions of students with disabilities or students who speak English as a second language should be provided adequate resources to meet their needs. Last, the equal opportunity principle claims that resources should be distributed equitably among schools, so that students or schools with certain characteristics or no more are no less likely to be provided with that

resource. For instance, in distributing text books, poor and minority students should not be more likely to receive old books than their white, more affluent peers.

Clotfelter et al. (2007a) employed the equal opportunity principle to evaluate the distribution of qualified teachers among North Carolina schools. Identifying several qualification indices, including teaching experience, certification type, graduate degrees, and National Board certification, the study compared the proportions of teachers meeting these standards by school poverty quartile. They found that students in high poverty schools are more likely to be instructed by teachers with lesser qualifications, indicating not meeting the equal opportunity principle of school equity.

In special education, the equal opportunity principle has not been used thus far to evaluate the distribution of special education teachers. Rather, much of the discussion regarding the provision of supplemental services in special education has centered on vertical equity, arguing that students with disabilities require varying levels of services and equipment in order to meet the same outcomes as their peers. Considering the distribution of resources from a different perspective allows new school equity arguments to be fostered. This is especially valid with current focus in NCLB on the inequitable distribution of teachers meeting the HQT standards, the acknowledgement of the overrepresentation of poor and minority students in special education, and the growing consensus of the role of teachers in student academic achievement.

Recruiting and Retaining Special Educators

In special education, two decades of research had documented the chronic shortage of teachers prepared to meet the needs of students with disabilities, a problem even more pronounced than shortages found in general education (Billingsley, 1993;

Billingsley, 2004b; Boe, 2006; Boe & Cook, 2006; Boe, Cook, Bobbitt, Tehranian, 1998; Smith-Davis & Billingsley, 1993). The shortages force administrators to rely on teachers prepared in other subject areas, long-term substitutes, and teachers not fully qualified for the position.

The combination of changes to certification standards resulting from IDEA (as many teachers unable to meet the HSQET standards were forced to leave the classroom), chronic shortages, and the uneven distribution of qualified educators pose a significant challenge for many school and district administrators laboring to fill vacant positions in special education. Even as schools began holding teachers to the standards established by NCLB and IDEA 2004, little research existed on the preparation and certification status of special educators and whether the supply would be ready to meet the standards. Rather, the available research focused on retention and attrition of special educators or used state-level data and self-reports from administrators to make imprecise, and sometimes inaccurate, conclusions about the status of the supply of special educators. Missing from the research is a clear description of the qualifications of the supply of special educators and an investigation into how the supply is distributed among schools.

<center>Purpose</center>

The purpose of this study was to provide a descriptive profile of the special education teachers in the 2003-04 administration of the SASS (SASS:04) and to examine how the qualifications of special education teachers in the SASS:04 sample varied among K-12 public schools according to the urbanicity or proportion of students in poverty within a school. The present study extends the methodology used by Clotfelter et al. (2007a) which compared the qualifications of special educators by school poverty

quartile within an equal opportunity framework. Unlike previous studies which often drew comparisons between teachers from special education and general education, this study documented how the qualifications of special educators differed by demographic characteristics (such as age range, gender, and race/ethnicity), and teaching positions (such as school level and teaching assignment). The teacher qualifications used are replicated from a series of studies conducted on teachers from New York and North Carolina investigating the uneven distribution of teachers by level of school poverty and different urban areas (Ascher & Fruchter, 2001; Boyd et al., 2007; Clotfelter, Ladd, & Vigdor, 2007; Lankford et al., 2002) as well as those used in special education studies (Boe, 2006; Boe & Cook, 2006; Boe, Cook, Bobbitt, Tehranian, 1998).

The study fills multiple gaps in research. First, it identified systematic differences in the qualifications of special educators by demographic characteristics and teaching positions. Second, it investigated the relationship between special education teacher qualifications and school characteristics, providing evidence of an uneven distribution. Third, it used data from the 2003-04 administration of the Schools and Staffing Survey, whereas other studies in special education used earlier administrations in their analyses. Fourth, it replicated and extended prior findings from general education on the uneven distribution of teachers by focusing on special education teachers, a field commonly excluded from studies. Last, it considers the distribution using the equal opportunity standard from Berne and Stiefel (1984, 1994), a perspective not used in other special education studies.

Data Source

   I utilized data obtained from the fifth administration of the SASS questionnaires.

Funded by the USDOE's National Center for Education Statistics (NCES), the SASS

collects data on elementary and secondary school teachers, their principals, and the

schools and districts in which they work (Tourkin et al., 2007). The sample included

teachers who indicated special education as their main teaching assignment on the

Teacher Questionnaire (n= 5,455). Special education teachers who indicated full and

part-time, itinerant, and long-term substitute teaching positions were included in the

analysis (n= 5,263). The teacher qualifications profiled include (a) amount of teacher

preparation, (b) degree major in special education or other education (undergraduate or

graduate), (c) degree level (undergraduate and/or graduate), (d) certification in special

education, (e) certification in education, (f) type of preparation program, and (g) teaching

experience. Analysis of qualifications included differences among the sample according

to demographic characteristics, teaching position, school poverty quartile, and urbanicity.

   The SASS:04 collected data during fall of the 2003-2004 school year from three

sectors: public schools (including charter schools), private schools, and Bureau of Indian

Affairs (BIA) funded schools (Tourkin et al., 2007). In 2003, approximately 5,400 public

school districts, 13,000 schools, 13,000 principals, 63,000 teachers, and 10,000 school

library centers were sampled to complete the questionnaires. The sample included

individuals from both public and private schools, providing nationally representative data

for policymakers and researchers to investigate such things as the characteristics of the

supply of teachers and principals, the presence of professional development and

mentorship programs, and the allocation of resources, such as computers and library materials. A more complete description of this dataset is provided in Chapter III.

Research Questions

Three main research questions guided the analysis:

Research question 1: What are the characteristics of the special education teachers in the SASS:04 sample in terms of measures of teacher qualifications (amount of teacher preparation, degree major in special education or other education, degree level, certification in special education, certification in education, type of preparation program, and teaching experience)? Do the qualifications vary among teachers according to (a) demographic characteristics (gender, age, and race/ethnicity), or (b) teaching position (teaching assignment and school level)?

Research question 2: How do the qualifications of special educators in high poverty schools compare to the qualifications of special educators in low poverty schools? How do qualifications vary across different urban areas (large or mid-size central city, urban fringe of large or mid-size central city, small town/rural)?

Research question 3: Do special education teachers in (a) high poverty schools, (b) urban schools, (c) rural schools, meet the same qualifications as special education teachers in other schools?

Significance of the Study

This study added to the research literature in both special and general education in several ways. First, it provided a descriptive profile of the qualifications of special education teachers included in the SASS:04 dataset. This has not been done as previous research in special education utilized earlier versions of the SASS datasets. Utilization of

the SASS:04 dataset provided a snapshot of the special education workforce as state

education agencies and teacher preparation programs began to make the necessary

changes to meet standards set in place in the HQSET provisions. Second, it employed

qualification indices similar to those used in general education enabling future

comparisons to be made between the fields. Third, it added to the research literature on

the distribution of teachers, focusing on the field of special education, a group often

removed from similar analyses. Last, it evaluated school resource equity in special

education using the equal opportunity principle, a framework not used before in special

education.

Summary

In spite of disagreement among researchers over the definition of teacher quality,

both NCLB and IDEA 2004 set out new standards for teachers, demanding all students be

taught by highly qualified teachers. In special education, problems with chronic shortages

and frequent turnover may hinder schools from meeting this lofty goal, especially in

schools with high proportions of poor and minority students and in rural areas. The

uneven distribution of special educators among schools complicates meeting the federal

mandates, and is major cause of concern to school administrators and policymakers. This

is troublesome in light of emerging research on the role of teachers to raise student

achievement, especially for students from poor and minority backgrounds. The SASS:04

dataset allowed an opportunity to describe the qualifications of special educators using a

nationally representative data set and to explore how the distribution of special educators

varied among schools. These findings contribute to our knowledge about the

qualifications and distribution of special educators across schools and should be valuable

to policymakers when IDEA 2004 is reauthorized.

Definition of Terms

The terms used in this study are defined as follows:

Alternative Routes to Certification (ARC) are programs meant to fast-track individuals with content-area expertise into the classroom, often by passing traditional student teaching and other field-based experiences

Attrition is the loss of teachers from their original classroom, possibly by moving to other classrooms, to other roles (such as an administrator or a guidance counselor), to other professions, or due to changes in life circumstances (for example, retirement, illness, or pregnancy)

Common Core of Data includes information on public schools, public charter schools, and Bureau of Indian Affairs schools regarding enrollment, demographics, grade span, performance on grade-level assessments, and school funding. The National Center for Education Statistics makes this information publicly available at their website: www.nces.ed.gov/ccd

Highly Objective, Uniform Standards of State Evaluation (HOUSSE) are the plans NCLB encourages states to create so current teachers can demonstrate content area expertise in one or more subject areas by means other than standardized tests and additional coursework (though these may be included)

Highly Qualified Teacher (HQT) are the provisions within NCLB setting national standards for teachers; these include all teachers must hold a bachelor's degree, meet full state certification, and demonstrate content area expertise

Highly Qualified Special Education Teachers (HQSET) are the provisions within IDEA 2004 setting national standards for special educators; these include all special education

teachers must hold a bachelor's degree, meet full state certification in special education, and demonstrate content area expertise for the courses in which they are the primary teacher

Large-scale datasets are information collected by an organization, such as a state education agencies or a research group, that allow researchers to manipulate variables, demonstrating potential statistical relationships

Retention relates to those teachers choosing to remain in the same classroom role from one year to the next

Schools and Staffing Survey (SASS) is conducted by the National Center for Education Statistics every four to five years to provide national-level data on the characteristics, experiences, and preparation of teachers

Secondary data analysis refers to the use of large-scale data sets to interpret and explain the relationship among a large number of variables using statistics

State education agencies are the branches or divisions within a state responsible for setting standards for teacher preparation, issuing initial and advanced licensure or certification, and monitoring compliance with NCLB and state policies

Teacher certification or teacher licensure are state-determined standards for new and current teachers; to maintain consistency, throughout this study I used the term *teacher certification* to represent both since states use the terms interchangeably

Teacher qualifications include variables that researchers use as indicators of teacher quality; examples include type of preparation, years of experience, scores on standardized tests, attainment of advanced degrees, and certification; studies have tried to demonstrate relationships between these characteristics with student achievement

Teacher quality refers to how effective a teacher is in getting students to meet some

indicator of educational success (such as graduation, performance on an assessment, and

attendance); the possible teacher traits and their measurement are highly contested

CHAPTER II

Review of the Literature

The purpose of this study was to provide a descriptive profile of a sample of the special education teachers in the 2003-04 administration of the SASS and to explore how the distribution of special education teachers in the SASS:04 sample varied among K-12 public schools in terms of teacher qualifications and school demographics. Analysis of the qualifications included differences in demographic characteristics and teaching position. This chapter provides a review of the literature regarding the definition of teacher quality and the problem of providing a qualified teacher to all students. Section one presents the research on teacher quality in general and special education; it examines the difficulties faced by researchers in defining "quality" and the indicators often used in research. Section two describes the role of NCLB and IDEA 2004 in setting national standards of teacher quality and demanding that all students have access to a highly qualified teacher. Finally, Section three addresses the problem of providing all students, especially those with disabilities, access to a qualified teacher.

Research on Teacher Quality

There is little consensus among researchers as to which qualifications truly matter (Cochran-Smith & Fries, 2005). The research on teacher quality comes mainly from the general education literature and can be summarized according to two lines of thinking. The first group uses teacher qualifications as indicators of quality, such as certification, years of experience, or graduate degrees. The second group measures annual student gains in academic achievement according to state and national examinations to estimate teacher effectiveness. This section summarizes the research findings from each group and their relationship with the HQSET provisions. While the majority of research is centered

on general education students, research on teacher quality in the field of special education is examined to conclude this section.

Teacher Qualifications and Teacher Quality

Research on teacher qualifications generally focuses on the characteristics and qualifications teachers bring with them to the classroom (Cochran-Smith & Fries, 2005; Goe, 2007; Rice, 2003). Characteristics that have been examined include age, gender, and race/ethnicity, while qualifications have consisted of scores on teacher examinations, certification in teaching, selectivity of the college or university of teacher preparation, or years of experience. These studies examined the extent to which teachers possess certain qualifications, but may not consider how the qualifications link to student achievement data (Goe, 2007). Other research methods used to study teacher qualifications included observations of teaching, comparisons of teachers with and without some characteristic, and interviews with teachers (Rice, 2003). To date, conflicting findings have provided little guidance to federal and state policymakers about which teacher qualifications are most important to target in policies and new programs.

A number of reviews of studies examining teacher qualifications were published during the late 1990s and early 2000s. The reviews often were used to support the opposing perspectives among professional organizations and researchers who either advocated for the professionalization of teaching or the deregulatation of teaching (see Abell Foundation, 2001; Ballou & Podgursky, 2000; Darling-Hammond, 2000a, 2000b; Darling-Hammond & Youngs, 2002; Whitehurst, 2002). Further complicating the matter, an additional group of researchers conducted methodological reviews pointing out gaps in the findings of the teacher qualification studies and calling attention to methodological

and design issues, such as the over-reliance on studies focused on a certain content area or age-group (Allen, 2003; Lauer, 2001; Rice, 2003; Wilson & Floden, 2002; Wilson, Floden, & Ferrini-Mundy, 2002).

Collectively, the reviews did allow researchers to conclude that there is some evidence to support the importance of teacher certification and content knowledge to student achievement (Rice, 2003; Wayne & Youngs, 2003). However, researchers warned of the many limitations of the research which hinder generalization of the findings on teacher qualification studies to all teachers (Rice). For instance, the majority of studies focused only on certain grade levels and certain subjects (primarily secondary mathematics) and used weak research designs (Cochran-Smith & Fries, 2005). Researchers further recommended that additional studies on teacher quality using multi-site, longitudinal research designs were needed before this information could be useful to policymakers or practice.

Teacher Effectiveness in Defining Teacher Quality

The second group of investigations that attempted to define teacher quality is based on the relationship between qualifications and increased academic achievement. In recent years, these studies have been aided by the availability of large databases housed in state departments of education and local school districts that contain vast amounts of student and teacher information. The databases have allowed researchers to employ multivariate statistical procedures to investigate the effect of an array of teacher and classroom characteristics on student academic achievement. For example, teacher effectiveness studies can control for student prior achievement and other classroom characteristics, providing researchers an opportunity to isolate the teacher's role in raising

student achievement over the course of a school year (Goe, 2007; Cochran-Smith & Fries, 2005). Also termed value-added studies, the emphasis is placed on the ability of a teacher to enable students to make significant gains in their academic achievement (Goe).

All states and some large urban and suburban districts, such as New York City and Chicago, collect large amounts of student, classroom, and school-level data to comply with both NCLB and IDEA as well as court mandates following state litigation regarding the equitable distribution of resources among schools (Cochran-Smith & Fries, 2005). The data systems include information on teacher qualifications, school characteristics, and student achievement. At the same time, funding initiatives from the USDOE allowed researchers to use nationally representative databases available from the National Center for Education Statistics (NCES), such as the SASS, the National Assessment of Educational Progress (NAEP), and the Education Longitudinal Study of 2002 (ELS:2002). These datasets allow researchers to explore statistically the causal relationship between students, classrooms, teachers, and schools at multiple levels and over time.

Unlike the teacher qualification studies, the research on student outcomes incorporates data on student academic achievement to measure the relationship between the qualifications and standardized test scores (Goe, 2007). Qualifications investigated include possessing full state certification rather than emergency or temporary certificates; participation in basic skills tests, such as the National Teachers Exam or Praxis Test; minimum scores on standardized tests, such as the Scholastic Aptitude Test (SAT); selectiveness of college preparation program; prior training in both content area and pedagogy; and experience as a classroom teacher (Clotfelter, Ladd, & Vigdor, 2007a,

2007b; Konstantopoulos, 2006; Nye et al., 2004; Rowan et al., 2002; Sanders & Rivers, 1996). Measuring the effects of teachers on student outcomes, these researchers estimated that about a fifth of the variation in student outcomes can be attributed to differences among teachers (Corcoran, 2007).

While the research evidence from teacher effectiveness studies supports that teachers are important to student achievement, it is inconsistent as to which qualifications matter most (Boyd et al., 2007; Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004; Sanders & Rivers, 1996). Multilevel modeling techniques allow researchers to investigate whether it is the school and/or classroom effects, rather than the teacher effects, which contribute to the large variation in student outcomes. The studies add variables such as prior student achievement, classroom climate, the availability of textbooks, and parental support to the teacher qualification measures, finding these variables also explain a large portion of the variation in achievement among students (McCaffery, Lockwood, Korentz, Louis, & Hamilton, 2004; Nye, Konstantopoulos, & Hedges, 2004). In addition, the richness of the dataset and the types of statistical analyses employed seem to impact the findings in terms of which qualifications a researcher is able to investigate and how other classroom and school variables can be modeled (Clotfelter et al., 2005; Lankford et al., 2002).

In spite of the inconsistent findings, mounting evidence provides support that at least two teacher characteristics matter for all teachers in terms of increasing student academic gains (Jacob). The first is teaching experience, although each additional year does not equate to an additional unit of achievement. The difference seems to come after a teacher accrues two to three years of experience (Boyd et al., 2005; Kane, Rockoff, &

Staiger, 2006; Rockoff, 2004). Students in classrooms with new teachers fair worse than students in classrooms with a teacher with at least three years of experience. After the third year, however, the difference in achievement gains made by students of teachers with additional experience appears to be marginal. The second teacher characteristic that seems to influence student academic achievement is cognitive ability, as measured by a teachers' exam scores on the Scholastic Aptitude Test (SAT), teacher certification exams, or completion of an undergraduate program at a more competitive university (Harris & Sass, 2006; Jacob). However, the research on the relationship between a teacher's cognitive ability and student achievement is limited, as databases' including this information have only recently become available.

Measuring the Qualifications of Special Education Teachers

While general education research has focused on using large datasets and statistical analyses to define teacher quality, the majority of research on teacher quality from special education has relied on self-reports, record reviews, and opinions (for example, Nougaret, Scruggs, & Mastropieri, 2005; deBettencourt & Howard, 2004; Brownell, Ross, Colon, & McCallum, 2005; Duchnowski, Kutash, Sheffield, & Vaughn, 2006). Rather than using the available datasets to measure the qualifications of special educators, researchers more often used them to describe special education teacher shortages and attrition. The few studies that have investigated qualifications of special educators from a national perspective have used either the SPeNSE dataset or the SASS dataset. These studies are briefly described in the next sections.

The SPeNSE dataset. The Study of Personnel Needs in Special Education (SPeNSE) was funded by OSEP to investigate the supply of qualified teachers and related

service providers available to youth disabilities during the 1999-2000 school year (Carlson, Brauen, Klein, Schroll, & Willig, 2002). The one-time study included more than 8,000 professionals involved in the education of youth with disabilities. Participants, including special and general educators, paraprofessionals, related service providers, and administrators, completed telephone interviews about their qualifications, roles, and responsibilities. The design of SPeNSE allowed comparisons to be made regarding school and classroom conditions, qualifications, and demographic characteristics. In addition to published journal articles and research reports available that use the SPeNSE data, a website provides downloadable data tables with national estimates from the collected survey information.

Billingsley (2002) used the SPeNSE data to report on the characteristics and qualifications of beginning special education teachers (those with fewer than three years teaching experience). She found the majority of beginning special educators in the sample were white women in their mid-twenties. Of the first year special educators in the sample, more than half entered into the classroom uncertified in special education (63%). However, the vast majority of teachers sampled in their third year of teaching had gained certification in special education (94%). In terms of preparedness, newer teachers rated themselves lower on overall job performance compared with teachers with three of more years of experience (Billingsley).

Carlson et al. (2004) demonstrated how the SPeNSE data could be used to construct a teacher-quality variable following a two-step process. First, factor analysis was used to construct five individual factors representing (a) teaching experience, (b) credentials, (c) self-efficacy, (d) professionalism, and (c) selected classroom practices.

The first two factors (experience and credentials) replicated variables used in studies on

teacher qualifications from general education. Experience included the number of years

in teaching total and the number of years in special education; credentials measured the

level of certification, the number of fields the teacher is certified in, and the highest

degree earned. The other three factors (self-efficacy, professionalism, and selected

classroom practices) were similar to variables used in other studies of special educators

that relied on self-reported classroom practices and the respondents' feelings of

effectiveness or professionalism. Carlson et al. used the five factors to explain a

statistically significant portion of the variance among special educators, and found

experience accounted for most of the variance among the sample of special educators.

The second step in the analysis combined the five factors into a single measure

representing teacher quality using second-order factor analysis (Carlson et al., 2004). At

this stage, professionalism and self-efficacy emerged as the strongest factors to explain

the variance in qualifications among the sample of special educators. Professionalism

represented whether a teacher belonged to any professional organizations, received any

professional journals, or sought the advice of other professionals. Self-efficacy included

variables for the self-reported perception of a teacher's skills in completing some of the

tasks essential to a special educator, such as instructional techniques, managing behavior,

and modifying instruction. Carlson et al. provided only statistical information about the

cohesiveness of the factors. They recommended using the factors as a model for future

investigations with other datasets, such as the Special Education Elementary Longitudinal

Study (SEELS), to measure the influence of teacher qualifications on student

achievement. In addition, they suggested that the factors could be used with a different

sample of special education teachers to see if the model is consistent or to investigate whether teachers measuring highly on the indicators work in certain places or with certain groups of students.

The SPeNSE website hosts data tables and numerous descriptive reports on the qualifications and characteristics of teachers, related service providers, and paraprofessionals (http://ferdig.coe.ufl.edu/spense/scripts/tables/ChooseReport.asp). Review of the data tables indicated that as the proportion of students living in poverty increased, the likelihood of the special educator to be certified in their main teaching assignment decreased (http://ferdig.coe.ufl.edu/spense/scripts/tables/ChooseReport.asp). Similarly, as the percent of poverty increased in a district, the proportion of teachers with an emergency certificate increased.

The SPeNSE study provided much information about the qualifications and characteristics of special education teachers. The present study extends the SPeNSE study by updating information on the qualifications of special educators and evaluating whether there are differences within the sample according to age, gender, and race. It also further investigates the distribution of qualified special educators among schools.

The SASS datasets. A second dataset, the Schools and Staffing Survey, has been used to describe the supply of special education teachers. Unlike SPeNSE, which occurred several years prior to the implementation of NCLB and IDEA 2004, the SASS:04 data collection occurred as state education agencies were figuring out how the HQT policies would be implemented. Unlike the SPeNSE study, there are plans to replicate the SASS design; the next version will collect nationally representative information about schools and teachers during the 2007-08 school years. The SASS:04

dataset provides an opportunity to investigate teacher qualifications at the time of the implementation of NCLB and IDEA 2004, while the replicated design in 2008 will measure changes made in the qualifications of teachers after states have made adjustments to align with federal policy. However, to date no studies have been published that have utilized the SASS:04 dataset. The studies that have investigated the qualifications of special educators and problems of retention and attrition used earlier versions of SASS. Five studies that used SASS in special education are described in this section.

The SASS datasets have been used extensively to study teacher retention and attrition in both general education and special education (for example, Ingersoll, 2001; Boe, Bobbitt, & Cook, 1997; Boe, Bobbitt, Cook, Whitener et al., 1997). Other investigations in general education used SASS to describe retention and attrition among particular groups of general educators (for example men or science teachers; see Cognard-Black, 2004; Kelly, 2004a; Shen, 2001), job perception (Liu & Meyer, 2005), and teacher tracking (Kelly, 2004b). In special education, researchers have used SASS to describe of the supply of special educators and to analyze the differences between general educators and special educators in terms of certification status, teacher shortages, and teacher retention (Boe et al., 1998; Boe et al., 2007; Boe, Bobbitt, & Cook, 1997; Boe, Bobbitt, Cook, Whitener et al., 1997; Boe & Cook, 2006). The studies used the Teacher Questionnaire and the Teacher Follow-up Survey (TFS) to investigate the qualifications and characteristics of the teaching supply in the U.S. The Teacher Questionnaire included questions about their pre-service preparation, their certification status, and their involvement in professional development activities. The following school year, the TFS

identified which teachers continued in their present position, which transferred schools or grades, and which chose to leave teaching altogether (see appendix A for more information about the SASS). Table 1 presents key pieces of information about each study, including which administration of SASS and/or TFS was used and if other supplemental datasets were incorporated in the analysis.

INSERT TABLE 1 ABOUT HERE

Both Boe, Bobbitt, and Cook (1997) and Boe, Bobbitt, Cook, Whitener et al. (1997) studied teacher retention and attrition using 1987-88 SASS and the 1989 TFS. The samples used in the analyses were limited to public school teachers who completed both the Teacher Questionnaire and the TFS. Boe, Bobbitt, and Cook (1997) explored the four components of turnover in education, comparing general educators to special educators. The components included: (a) school retention (teachers who stay in the same school from one year to the next), (b) school reassignment (teachers who switch to a different school within the same district), (c) school migration (teachers who move to a new school in a different district), and (d) attrition (teachers who choose to leave the classroom altogether). Boe, Bobbitt, and Cook found that although general educators and special educators have similar proportions of movement among schools and districts in all four categories, a significantly greater number of special education teachers decide to become general educators in the following year. A similar pattern is not found among general educators who could choose to become special educators. This may be due to the large number of teachers certified in other areas who choose to accept a position in special education until a position in their content area becomes available.

Investigating the reasons teachers chose to leave the classroom, Boe, Bobbitt, Cook, Whitener et al. (1997) found little difference between general and special educators. Age was a significant predictor of attrition for both groups, following a U-shaped path rather than the linear pattern as previously believed. Teachers tended to leave the field earlier in their careers, when they had less experience. Later, the rate of attrition from the classroom increased as teachers neared retirement or moved into administrative roles. Along with experience, holding full certification in teaching increased the retention rate among both special and general educators. Gender, race, and highest earned degree, however, did not impact rates of attrition. Age and base salary appeared as the only significant predictors with teachers' decisions to stay. Placed within a policy perspective, Boe, Bobbitt, Cook, Whitener et al. contend that policies that emphasize hiring experienced, certified teachers should be considered to improve retention rates. The effect of certification and experience on retention is worth noting in light of the current emphasis on ARC programs to fill vacant positions, especially in secondary math, science, and special education.

Boe et al. (1998) used the 1990-91 administration of SASS along with data from the State Special Education Personnel Data Collection and Reporting System (SSEPDCS) to investigate teacher shortages and to compare the supply of general educators to the supply of special educators. The SSEPDCS was a data collection system used by OSEP to collect, monitor, and report information from states on the implementation of IDEA. Reports showed few vacancies in special education recorded annually and that the majority of positions were held by certified teachers. Boe et al. noted that the SSEPDCS reports did not include information as to which area these teachers held certification,

providing no information as to what portion of the available supply of special educators had preparation and qualifications specifically in special education. In their analysis, Boe et al. calculated the number of teachers in the SASS sample without any type of certification along with the number of teachers with certification in content areas other than special education. Removing these teachers from the total number of positions in special education significantly worsened the teacher shortage problem. The analyses found that the insufficient supply of qualified educators for teaching positions is much more serious in special education than in general education. Boe et al. attributed the shortage not only to high rates of attrition, but also the insufficient number of new special educators entering classrooms, forcing administrators to rely on individuals willing to accept the position who may not fully be prepared to do so.

Boe and Cook (2006) supplemented the 1999-2000 administration of SASS with descriptive data from earlier SASS administrations and with information from the Data Analysis System (DANS) to analyze trends in the supply of special educators. The DANS replaced the SSEPDCS as the main mechanism for state reporting on the implementation of IDEA. The Boe and Cook study extended the Boe et al. (1998) study by examining the certification status, experience, and preparation of special and general educators. Trend data from SASS and OSEP showed that not only was the shortage significant, it was growing in severity for a variety of reasons. These included the increased numbers of students eligible for special education services, unacceptably high attrition rates among special educators, and too few new teachers entering into special education from teacher preparation programs.

Again comparing the supply of special educators to general educators, Boe and Cook (2006) reported several significant differences. In addition to certification status, this analysis included measures regarding the extent of teacher preparation, time of entry into the workforce, and field of degree major for an individual. Their findings echoed previous research on the certification status and preparation of special education teachers; while the proportion of fully certified teachers from both fields is similar, a larger proportion of special educators enter the classroom only partly certified. Furthermore, a large portion of special educators with certification who met the standards for extensive teacher preparation had a background in general education, rather than in special education. Boe and Cook state that the best source of new teachers with extensive teacher preparation and certification in special education was not teacher preparation programs or general education teachers, but private school teachers, who may be willing to migrate to public schools for better pay and benefits.

Boe et al. (2007) used the1999-2000 administration of SASS to measure the qualifications of beginning teachers in both general and special education and to highlight the relationship between the pre-service preparation of beginning educators with indicators of teacher qualifications. Beginning teachers in this study were defined as full or part-time teachers from general and special education in the first five years of teaching. A ranked, categorical variable grouped all teachers based on the completion of activities common to pre-service preparation programs (i.e., the length of student teaching, receiving feedback on teaching performance, and coursework in pedagogy). They categorized beginning teachers as having (a) extensive teacher preparation, (b) some teacher preparation, or (c) little or no teacher preparation.

Performing chi-square tests and logistic regression, Boe et al. (2007) analyzed the relationship between the amount of preparation and five teacher qualification indicators: (a) certification in main teaching assignment, (b) in-and out-of -field teaching assignment, (c) degree major field, (d) degree level, and (e) teacher reports of being well-prepared to teach. The qualification indices were meant to represent the standards for content area expertise and certification established by the HQT provisions in NCLB. However, Boe et al. defined the content area for special educators based on the teacher's major in special education and the disability status of the students they teach (for instance, majoring in learning disabilities and a main teaching assignment with students with learning disabilities) due to limitations in the questionnaire. This is contrary to NCLB which defines content area expertise by core academic subjects, such as math, language arts, etc.

This study attempted to understand the relationship between teacher qualifications and teacher preparation. Boe et al. (2007) argued against a statement that teacher preparation programs are, "failing to produce the types of highly qualified teachers that the No Child Left Behind Act demands," made by the USDOE (USDOE, 2003, p. viii). They reported that both general and special education teachers with extensive teacher preparation were more likely to be fully certified and to teach in their content area, as well as to report feeling better prepared to teach in their first few years.

Investigations by Boe and his colleagues using the SASS datasets provided much information about the supply of special educators, including: (a) the relationship between teacher preparation and indicators of teacher quality, (b) the reasons teachers choose to stay or leave, (c) where teachers choose to go, and (d) how the supply of special

educators compares with general educators in terms of certification and preparation. The SPeNSE data tables provided some evidence of an uneven distribution of special educators, though little otherwise has been done with these datasets to investigate how the shortage in special education may be experienced differently at the district, or even school, level (McLeskey et al., 2004). The next section looks at several other sources of data that have been used to investigate the special education teacher supply, including the DANS (used independently of SASS) and surveys conducted by independent research organizations. However, limitations in the collection and analysis of these sources of data hinder researchers and administrators from understanding how certain qualifications may contribute to greater academic achievement among students with disabilities or how special educators are distributed among schools.

Other sources of data. As mentioned earlier, the information from DANS has been used to show that the vast majority of teaching vacancies are filled annually, often by certified teachers (Boe, 2006; McLeskey et al., 2004; Katsiyannis et al., 2003). The annual reports by OSEP to Congress on the implementation of IDEA rely on this data to provide evidence of decreasing the shortage of certified special educators. However, these data are reported at the state level and only pertain to certification status. Earlier versions of the DANS attempted to collect information on specific disability categories, but the variation in certification types among states and the move to broader categorical certification categories hindered these efforts (McLeskey et al., 2004). Moreover, the DANS data does not account for what type of certification the teachers might hold (other than in special education) or whether there is variation between school districts and among schools (McLeskey et al., 2004).

Surveys conducted by the Urban Teacher Collaborative and the Appalachian Regional Educational Laboratory (AEL), find that administrators in both large, urban districts as well as in rural districts face difficulties recruiting and retaining qualified teachers annually, especially in special education (Recruiting New Teachers, Inc., 2000; Schwartzbeck & Prince, 2003). These surveys relied on the self-reported experiences of district administrators who may not be involved directly with the hiring process or may not be fully aware of how the special educators in their district sort among schools. However, they do provide evidence that the difficulties faced filling positions with qualified teachers may not be experienced in the same manner in all schools.

Annual reports from the American Association for Employment in Education (AAEE) point out that the number of positions available in special education exceeds the number of teachers prepared by college and university preparation programs. In addition, certain disability categories, including emotional disturbance and severe disabilities, are affected by the shortage more than other categories (AAEE, 2005). Annually, the AAEE relies on reports from college career counselors regarding the number of pre-service teachers graduating and the number of positions made known to the counselor to report on the teacher supply. These sources provide state and federal policymakers' information regarding the inadequate number of special educators prepared by teacher preparation programs, but does little to characterize the qualifications or the distribution of the present supply.

Summary

In spite of abundant efforts to define teacher quality from either a teacher qualifications or teacher effectiveness perspective, there exists no clear evidence as to

which teacher qualifications matter most to student academic achievement, although emerging research supports the value of teaching experience and high verbal ability (Jacob, 2007). In special education, the SPeNSE and SASS datasets were used extensively to describe the special education teaching supply and to report the rates of attrition and retention. Researchers identified attrition as a considerable problem facing schools, especially in special education where many teachers enter classrooms unprepared and uncertified for the position (Boe, Bobbitt, & Cook, 1997; Boe, Bobbitt, Cook, Whitener et al., 1997). In spite of on-going debates as to the definition of teacher quality, federal policymakers insist that states must set standards for teachers, as defined by NCLB and IDEA 2004. Ensuring that students in all schools have available to them a teacher who meets these standards is crucial to creating an equitable educational system. The next section describes how federal policymakers interpreted the research as they defined highly qualified teachers.

<div style="text-align:center">Policy and Teacher Quality</div>

Historically, states were given the authority to establish educational policies, such as the length of the school day and school year, ages for compulsory education, and the requirements for teacher certification (Angus, 2001; Bales, 2006). This led to variations among the states in terms of the specificity of the policies and the extent to which states monitored local school districts. In some states, local school boards remained largely in control with little oversight from state education agencies. Although teacher certification standards may have been in place according to state policy, there was little monitoring as to whether school districts ensured that all teachers met the requirements (Bales). The lack of oversight permitted administrators to fill open vacancies with teachers who may

not have met the certification requirements or to rely on long-term substitute teachers and teachers with only emergency certification or temporary licensure (Bales; Cohen-Vogel, 2005). However, the movement to raise standards in education for both students and their teachers beginning in the 1980s brought attention to the discrepancies, forcing legislators to amend policies and administrators to alter practices.

The extent to which individual states participated in the move to raise standards for certification differed significantly among states. In many states, the national trend for increased standards in public education for students and their teachers led to greater state-defined quality controls in place of local governance (Bales, 2006). Higher standards for teachers also affected teacher preparation programs, often by adding more coursework in pedagogy and increased time spent in field placements during student teaching experiences to existing certification requirements (Bales). For instance, in Minnesota if a teacher were to teach in a subject area outside his or her primary area of teaching,

> she [sic] must already be licensed with at least a minor in that field, and
>
> can receive a temporary license in the new field only briefly while
>
> completing a major. By contrast, in Louisiana, a prospective high school
>
> teacher could be licensed without even a minor in the field she was going
>
> to teach. The state would not require her to have studied curriculum,
>
> teaching strategies, classroom management, uses of technology, or the
>
> needs of special education students, and she could receive a license with
>
> only six weeks of student teaching (Darling-Hammond, 2000a, p. 20).

Even in states with high standards for teaching, few state education agencies monitored schools and school districts to ensure all teachers met certification standards. Individuals

without certification or preparation could hold classroom teaching positions, often classified as "emergency" or "provisional." Such practices permitted variations in the number of teachers who actually met state standards among schools (Darling-Hammond).

The Influence of Research on Federal Teacher Policies

The awareness of variation among states in terms of curricular standards, resource allocations, and teacher preparation led to increased research efforts to ensure equity and adequacy among schools. At the same time, awareness of growing gaps in academic achievement among students, especially those disadvantaged by race or poverty, began to draw the attention of policymakers, administrators, researchers, and the public at large. Leading the way, Darling-Hammond (2000b) used data from several sources to inspect teacher certification policies and student outcomes among states. She found that states with more clearly defined certification standards and rigid enforcement policies, such as Minnesota and Wisconsin, had significantly higher scores on the NAEP (Darling-Hammond). In comparison, states such as Louisiana, where fewer teachers held state certification and majored in their content area, scored significantly lower on the NAEP. In addition to certification standards, states with higher scores on the NAEP in math and reading allocated more state funding to the training of pre-service teachers annually. She recommended that states raise certification and preparation standards for teachers and increase statewide funding of pre-service programs and professional development in order to raise student academic achievement.

The findings shed light on the substantial variation among states regarding certification standards for teachers. Proponents used the findings to urge policymakers to institute higher standards for the preparation and certification of teachers at both the state

and federal levels. Detractors, however, argued that the flaws in the research methodology rendered the findings biased (Abell Foundation 2001a, 2001b; Ballou & Podgursky, 2000). Instead of increasing the requirements for teachers, these researchers pushed for the wholesale removal of certification policies so that professionals from outside of education could quickly enter the field. Acknowledging each side of the debate, federal policymakers passed legislation that simultaneously forced states to increase certification standards for teachers and at the same time encouraged states to decrease the time it takes for new teachers with content expertise to enter into teaching through alternative routes to certification (ARC) programs (Cochran-Smith & Fries, 2005; Rice, 2008).

No Child Left Behind Act of 2001

Heightened awareness of achievement gaps among students and the inequitable distribution of resources, including qualified teachers, led to increased involvement from federal policymakers. Title I of NCLB reaffirmed the original intention of ESEA: to evenly distribute resources in order to achieve equitable educational outcomes for all students, including those disadvantaged by poverty, race, and neglect (No Child Left Behind Act of 2001, P.L. 107-110, §1001.1). To ensure adequate outcomes for all students, the law purposefully, "tied state compliance to a series of public reporting systems and essential public and higher education funding" (Bales, 2006, p. 403). For states to retain the funding supplied to them through ESEA, certain expectations and standards had to be met by all schools within the state. The expectations included reporting student achievement on standardized tests in math, reading, and (beginning in the 2005-06 school year) science in grades three through eight; participating in the NAEP

in grades four and eight; and ensuring a HQT in core academic subjects for all students (Yell & Drasgow, 2005). The HQT requirements led to major policy and programmatic changes from state education agencies, IHEs, and among schools.

The NCLB affected how state education agencies granted teacher certification and monitored schools and school districts. The HQT policies set at a minimum that States require teachers in core academic subjects to have at least a bachelor's degree, hold full state certification, and demonstrate content knowledge in their main teaching area (Title I- Improving the Academic Achievement of the Disadvantaged, Final Rule, 2002). The provisions also prohibited states from using emergency, temporary, or other forms of certification in the absence of individuals meeting state certification requirements. Individuals not meeting full state certification can be employed as teachers, so long as they actively work towards certification, attaining it within three years of accepting a position, through a district, state, or university-operated program (Title I- Improving the Academic Achievement of the Disadvantaged, Final Rule). Furthermore states must, "ensure that minority children and children from low-income families are not taught at higher rates than other children by inexperienced, unqualified, or out-of-field teachers" (Title I- Improving the Academic Achievement of the Disadvantaged, Final Rule).

Meeting the HQT demands of NCLB. The NCLB included specific monitoring requirements to measure the extent to which states met the major goals of the policy, including that all students will be taught by a highly qualified teacher (P.L. 107-110, §1119.a.2). States must submit a Consolidated State Performance Report (CSPR) annually to the USDOE, identifying progress towards meeting the state-defined goals in accordance with NCLB (P.L. 107-110, §9303). January 2006 marked the first time state

education agencies were required to submit evidence to support the implementation of the HQT requirements in the CSPR (USDOE, 2007). According to the summary data from the USDOE based on the state reports, no state fully met the HQT requirements; state reports ranged from 52.8% of classrooms staffed by highly qualified teachers in the District of Columbia to 99% in Montana (USDOE). Gaps in the proportion of HQT in core academic subjects in high poverty schools compared to low poverty schools ran as high as 31.5 percentage points, as experienced among elementary schools in Maryland. And while some states, such as Arizona, Arkansas, Oklahoma, Utah, and West Virginia, saw significant decreases in the gaps between high and low poverty schools, it was not enough to demonstrate success in providing a HQT for all students (USDOE). The uneven distribution of teachers severely limits the nation's ability to create an equitable educational system, a principle at the heart of the ESEA.

In addition to the CSPR, state education agencies were instructed to submit equity plans to the USDOE on the dilemma of disproportionate assignment of novice and out-of-field teachers to minority students in July 2006 (Education Trust, 2006). Although the development of equity plans is outlined in Title I of NCLB, the provisions were largely ignored until 2006 (P.L. 107-110, §1112(c)(1)(L); Education Trust). In the plans, state education agencies were to evaluate the current distribution of teachers to poor and minority students, "outlining how the state would measure, address, and publicly report progress in eliminating the unfair distribution" (Education Trust, p. 2). According to the analysis of the plans by Education Trust, only about ten states appropriately analyzed at least some of the data to be submitted in the plans.

NCLB and special education teachers. As states and local districts disentangled the federal regulations in NCLB, the significant impact it would have on district hiring practices in both general and special education became clear. Although special education was not specifically addressed in the language of NCLB, guidance issued by the USDOE clarified that "all teachers" included special educators teaching core academic subjects (Gelman, Pullen, & Kauffman, 2004; National Education Association, 2004). The ambiguous language related to certification standards and the emphasis on content knowledge posed significant challenges for special educators. For a field already facing chronic shortages, it seemed implausible that teachers would be able to meet standards for both disability-related expertise and in specific content areas, especially since special educators often teach multiple subjects across several grades (Gelman et al., 2004). The USDOE urged states to create multi-subject HOUSSE plans for teachers in rural schools and for special educators, permitting greater flexibility in these high-need areas (USDOE, 2004). It provided teachers meeting the HQT standards in a single subject with additional time and multiple pathways in which to meet the HQT standards for other subject areas of instruction. Additionally, opponents criticized that rather than raising standards as NCLB intended, the variations found among HOUSSE plans further perpetuated low standards in teacher preparation and certification and missed the opportunity to specify competencies essential for effective special educators (Brownell, Sindelar, Bishop, Langley, & Seo, 2002; Gelman et al., 2004).

The Government Accountability Office, OSEP, and several related interest groups, such as the National Education Agency, the Council for Exceptional Children, and the National Association for State Directors of Special Education, criticized the

absence of guidance regarding the HQT provisions for special educators. Guidance provided by the USDOE suggested that only those teachers providing direct instruction in a core academic subject needed to meet the HQT provisions, excluding teachers who co-teach or consult with general educators to modify the curriculum and provide accommodations for students (USDOE, 2004). The criticisms and uncertainty led to the inclusion of new language and clarification of the certification requirements for teachers of students with disabilities in the reauthorization process of IDEA in 2004.

Individuals with Disabilities Education Improvement Act of 2004

The 2004 amendments to IDEA aligned special education policy to a greater extent with the standards and accountability structures outlined by NCLB (Yell et al., 2006). Prior to IDEA 2004, states were left the authority to establish certification standards for special educators and other related service personnel (Mandlawitz, 2007). Similar to general education, standards for special educators varied among states regarding and the types of certification offered and the amount or preparation needed (ECS, 2004). Incongruity between colleges and university preparation programs and their respective states added to the discord (Putnam & Habanek, 1993; National Clearinghouse for Professions in Special Education, 2001). Furthermore, research on teachers and student academic achievement typically removed special educators and students from the samples due to lack of consistent outcome measures, considerable variations in educational settings, and the varying teacher roles of special educators in the classroom. This left the field unclear as to how to define teacher quality and which qualifications to emphasize (Blanton et al., 2006). As the field of general education struggled to make

sense of the HQT provisions, special education too needed to create clarity and consistency.

Defining highly qualified special educators. The final regulations published by OSEP in August, 2006 defined the standards for HQSET, clarifying different expectations based on the special educators' teaching assignment (Assistance to States for the Education of Children with Disabilities and Preschool Grants for Children with Disabilities, 2006). Similar to the policies set forth by the NCLB, the amended IDEA reinforced the need to provide all students with disabilities access to a qualified special educator, emphasizing a teachers' role on the academic success of students with disabilities. It reinforced the dual-role of a special educator as a specialist in disabilities and as an instructor of academic subjects, insisting all special educators be certified in both realms.

The regulations differentiate among four types of special educators, including: (a) special educators teaching core academic subjects, (b) special educators in general, (c) special educators teaching to alternate achievement standards, and (d) special educators teaching multiple subjects. For the first group, special educators teaching core academic subjects in a public elementary or secondary school, the regulations state:

> The term highly qualified has the meaning given the term in section 9101
> of the ESEA and 34 CFR 200.56, except that the requirements for highly
> qualified also- (1) Include the requirements described in paragraph (b) of
> this section; and (2) Include the option for teachers to meet the
> requirements of section 9101 of the ESEA by meeting the requirements of
> paragraphs (c) and (d) of this section (Assistance to States for the

Education of Children with Disabilities and Preschool Grants for Children

with Disabilities, 34 C.F.R. §300.18.a).

This provision clarifies that those special educators providing direct instruction in content area classrooms must meet the same HQT requirements from NCLB in those subject areas as their general education peers. For instance, a special educator teaching a self-contained biology class would need to be highly qualified in biology in order to meet the HQSET standards. It also clarifies that special education teachers are eligible to become highly qualified through ARC programs and by HOUSSE plans, similar to general educators.

In addition to demonstrating expertise in core subject areas, special education teachers must also demonstrate knowledge of special education practices and skills. These requirements are clarified in the regulations regarding special education teachers in general, which state that to be highly qualified, a special education teacher must have:

(1) (i) … obtained full State certification as a special education teacher (including certification obtained through alternative routes to certification), or passed the State special education teacher licensing examination, and holds a license to teach in the State as a special education teacher… (Assistance to States for the Education of Children with Disabilities and Preschool Grants for Children with Disabilities, 2006, 34 C.F.R. §300.18.b).

The regulations require special education teachers to have a bachelor's degree and full state certification; it also prohibits states from waiving certification through emergency and temporary licensure. These general requirements apply to all special educators,

disregarding their role in content instruction. Furthermore, they may be the sole

requirements for a special educator not responsible for providing instruction in any

content area, such as a special educator providing only consultative services to a highly

qualified general educator. For instance, a special educator assisting a highly qualified

biology teacher by modifying lessons or assessments does not need to be highly qualified

in biology, but he or she does need to be highly qualified in special education.

Within the general requirements for special educators, OSEP also clarified the

requirements for participants of ARC programs. According to the regulations, ARC

programs meet the HQSET requirements if:

> (i) The teacher- (A) Receives high-quality professional development that
> is sustained, intensive, and classroom-focused in order to have a positive
> and lasting impact on classroom instruction, before and while teaching;
> (B) Participates in a program of intensive supervision that consists of
> structured guidance and regular ongoing support for teachers or a teacher
> mentoring program; (C) Assumes functions as a teacher only for a
> specified period of time not to exceed three years; and (D) Demonstrates
> satisfactory progress toward full certification as prescribed by the State;
> and (ii) The State ensures, through its certification and licensure process,
> that the provisions in paragraph (b)(2)(i) of this section are met
> (Assistance to States for the Education of Children with Disabilities and
> Preschool Grants for Children with Disabilities, 2006, 34 C.F.R.
> §300.18.b.2).

These provisions enable ARC program participants to be HQSET while simultaneously meeting certification standards. While it sets high standards for the ARC programs it is unclear whether there is any monitoring system established to determine if the programs meet these standards.

The fourth set of regulations acknowledges the variation in cognitive abilities among students with disabilities. The regulations for special educators teaching to alternate achievement standards clarify how the core subject area requirements can be interpreted for these teachers:

> When used with respect to a special education teacher who teaches core academic subjects exclusively to children who are assessed against alternate achievement standards established under 34 CFR 200.1(d), highly qualified means the teacher, whether new or not new to the profession, may either- (1) Meet the applicable requirements of section 9101 of the ESEA and 34 CFR 200.56 for any elementary, middle, or secondary school teacher who is new or not new to the profession; or (2) Meet the requirements of paragraph (B) or (C) of section 9101(23) of the ESEA as applied to an elementary school teacher, or, in the case of instruction above the elementary level, meet the requirements of paragraph (B) or (C) of section 9101(23) of the ESEA as applied to an elementary school teacher and have subject matter knowledge appropriate to the level of instruction being provided and needed to effectively teach to those standards, and determined by the State (Assistance to States for the

Education of Children with Disabilities and Preschool Grants for Children

with Disabilities, 2006, 34 C.F.R. § 300.18.c).

The regulations continue to require both special education and content area certification,

but the content area requirements can be interpreted to match the instruction-level of the

students being taught. States may allow these teachers to meet either the standards set for

any elementary, middle, or secondary teacher, or to meet the standards for elementary

teachers, so long as it is appropriate to the level of instruction of the students who are

held to those achievement standards.

The last group addressed in the regulations includes special educators responsible

for teaching multiple core academic content areas. Acknowledging that this is a common

practice in schools, the separate regulations state that these teachers still must meet the

content area requirement for each subject of instruction:

Subject to paragraph (e) of this section when used with respect to a special

education teacher who teaches two or more core academic subjects

exclusively to children with disabilities, highly qualified means that the

teacher may either- (1) Meet the applicable requirements of section 9101

of the ESEA and 34 CFR 200.56(b) or (c) (Assistance to States for the

Education of Children with Disabilities and Preschool Grants for Children

with Disabilities, 2006, 34 C.F.R. §300.18.d.1).

However, similar to general educators, the regulations also explain how an experienced

special education teacher could meet the standards through HOUSSE procedures

specifically designed for multiple subject areas (OSEP, 2006a):

(2) In the case of a teacher who is not new to the profession, demonstrate competence in all the core academic subjects in which the teacher teaches in the same manner as is required for an elementary, middle, or secondary school teacher who is not new to the profession under 34 CFR 200.56(c) which may include a single, high objective uniform State standard of evaluation (HOUSSE) covering multiple subjects (Assistance to States for the Education of Children with Disabilities and Preschool Grants for Children with Disabilities, 2006, 34 C.F.R. §300.18.d.2).

It also clarifies how new special educators can meet the requirements for multiple subject areas within the first few years of teaching:

(3) In the case of a new special education teacher who teaches multiple subjects and who is highly qualified in mathematics, language arts, or science, demonstrate not later than two years after the date of employment, competence in the other core academic subjects in which the teacher teaches in the same manner as is required for an elementary, middle, or secondary school teacher under 34 CFR 200.56(c), which may include a single HOUSSE covering multiple subjects (Assistance to States for the Education of Children with Disabilities and Preschool Grants for Children with Disabilities, 2006, 34 C.F.R. §300.18.d).

Even with the latitude provided to these teachers, the expectation of demonstrating content area expertise in all subjects remains a constant standard. Aligning standards for content area expertise for special education teachers was viewed as a way to ensure

special educators would be adequately prepared to assist students with disabilities to meet state proficiency standards (McLeskey & Ross, 2004; Yell et al., 2006).

Meeting the Requirements of IDEA 2004. IDEA 2004 requires states to monitor the extent to which all special education teachers met the HQSET requirements. Unlike the monitoring requirements from NCLB which require states to report on the number of classes taught by HQT, IDEA 2004 requires states to report the total number of HQSET in public schools (OSEP, 2006b). The data collection allows OSEP to measure progress towards providing an adequate supply of special educators, a dilemma documented by numerous government and agency reports (Kozleski, Mainzer, & Deschler, 2000; McLaughlin, Smith-Davis, & Burke, 1986; National Clearinghouse on Professions in Special Education, 1992; OSEP, 2002). The monitoring reports are meant to assist OSEP with identifying shortages in the field, but do little to help define how HQSETs are distributed among and within districts which may impact the field's ability to create an equitable educational system.

State education agencies reported difficulties with ensuring all special education teachers met state certification standards, a priority made explicit by IDEA 2004. State monitoring reports submitted to OSEP through the DANS and tables available from the IDEA Data website (https://www.ideadata.org/index.html) confirmed a shortage of fully certified special educators in most states. In fall of 2005, the reported proportions of teachers in states not fully certified ranged from zero in some states to 13% in others. Nationwide the proportion of special educators without certification was approximately 10% (https://www.ideadata.org/index.html). Since the data are reported only at the state

level, it is impossible to understand how the shortage may impact schools or school districts differently.

Other policies related to special educators. In exchange for providing additional monetary support for teacher education and professional programs, the Higher Education Act (P.L. 89-329; USDOE, 2006) requires monitoring reports related to the Title II Accountability Data policy. The USDOE collects these data from teacher preparation programs, alternative certification programs, testing companies, and from state education agencies to provide information about the preparation and certification of new teachers (USDOE). According to the reports, there have been improvements overall towards supplying all schools with HQSETs and significant reductions in the proportion of special education teachers in high poverty schools on waivers or emergency certification (USDOE). In spite of improvements, the proportion of teachers not meeting the highly qualified standards continued to be higher in high poverty schools compared to low poverty schools. Among special educators, the proportion of teachers on waivers (i.e., teachers not meeting certification standards or enrolled in an ARC program) during the 2004-05 school year ranged from zero to 22% among high poverty schools (USDOE).

At the state level, education agencies and district officials struggled to make sense of how the new requirements would affect the current supply of special educators. The HOUSSE procedures, meant to streamline the content knowledge requirements for experienced teachers, drew criticism for being either too simple or too cumbersome (Burdette, Lafflin, & Muller, 2005; CEC, 2005; Commission on No Child Left Behind, 2007). Difficulties emerged in response to the data collection and reporting requirements (Azordegan & Coble, 2004). Administrators reported difficulties finding and recruiting

teachers that could meet the additional standards, especially at the middle school level and in schools with higher proportions of poor and minority students (Center for Teaching and Learning, 2004; Center on Education Policy, 2007). These dilemmas and complaints made it difficult to believe that IDEA 2004 could really make a difference in providing all students with disabilities a qualified teacher.

Summary

Prior to the authorization of NCLB, federal involvement in teacher policies was limited to only indirect support of certain policies and programs. Consequently, great variation existed between states as to the requirements for certification. The emergence of research highlighting the variation among states coupled with growing awareness of the gaps in student academic achievement, especially for youth from disadvantaged backgrounds, led to clear federal involvement. Provisions for teachers within both NCLB and IDEA 2004 set the standards for the definition of quality, requiring all teachers in all schools to meet these standards. The HQT and HQSET provisions emphasized the importance of all teachers possessing state certification and content expertise relative to their current teaching positions. To monitor progress towards meeting these goals, annual reports must be submitted by states to the USDOE (USDOE, 2007). Reports submitted by states so far in accordance with NCLB, IDEA 2004, and the HEA provide evidence of a continued shortage and uneven distribution of HQSET.

Despite debates over the definition of teacher quality and the qualifications and preparation needed for effective instruction, federal policymakers set a definition for highly qualified teachers as a way to raise student academic achievement by increasing the requirements for teachers. Regardless of the definition used, there is ample evidence

from monitoring reports submitted by states and from emerging research that the supply of qualified educators are not evenly distributed among schools. The next section describes the research available that finds that a disproportionate amount of inexperienced, unprepared, and uncertified teachers work in hard-to-staff schools. The uneven distribution limits the ability to provide an equitable educational system for all students.

<center>The Distribution of Teachers</center>

The NCLB and IDEA 2004 mandate that all students should receive instruction from a highly qualified educator. However, there is evidence of an uneven distribution of qualified teachers among schools with higher proportions of poor, minority, and non-English speaking students (Clotfelter et al., 2006; Clotfelter, Ladd, & Vigdor, 2005; Ascher & Fruchter, 2001). Improving the instructional capacity within these schools is crucial in eliminating the achievement gap among disadvantaged groups and in meeting the accountability standards set forth by NCLB (Murnane, 2007). At the same time, the NCLB and the IDEA 2004 are criticized for worsening rather than alleviating the problem of teacher turnover, due to the increased standards for content knowledge imposed on all teachers and the restrictions placed on using temporary and emergency certification (McLeskey & Ross, 2004). The policy changes came despite scant data and limited understanding as to how the additional requirements would impact the already inadequate supply of special education teachers. The last section provides an overview of the research on the distribution of educators and introduces Berne and Stiefel's (1984, 1994) principles for measuring school equity. This model closely aligns with the purpose of the present study and provides a framework for evaluating the distribution of special

education teachers. Problems specific to the field of special education, including attrition, the role of ARC programs, and chronic shortages, are also addressed.

Measuring School Equity

Most of the research on the supply of special education teachers focuses on issues related to attrition, examining why teachers leave, the types of incentives to make them stay, and an individual's decision-making process. Similarly, in general education there exist numerous theoretical models using labor economics and sociology to account for the distribution, qualifications, and characteristics of teachers (for example, Ballou & Podgursky, 1997; Boyd, 2005a, 2005b; Brewer, 1996; Dolton & van der Klaauw, 1999; Hanushek, Kain, & Rivkin, 2004; Ingersoll, 2001; Stinebrickner, 2001). These frameworks focus on more on the decision-making process in determining where to work and whether to stay or leave. These individual decisions regarding whether and where to teach impact the overall distribution of qualified educators; however, it is worthwhile to evaluate the aftermath of the decision. Research findings suggest that more qualified teachers choose to leave schools with higher proportions of poor and minority teachers, forcing administrators to rely on new and inexperienced teachers to fill positions (Boyd et al., 2007, Jacob, 2007; Clotfelter et al., 2007a). This potentially leaves students in high poverty, high minority schools less likely to have access to a qualified teacher. In special education, no research related to this dilemma has been conducted to date, leaving the field unaware of potential bias in the distribution of teachers. To investigate this problem I use the equal opportunity standard, one of the equity principles developed by Berne and Stiefel to evaluate school finance equity (1984, 1994, 2003).

Berne and Stiefel (1984) first used in their equity framework to evaluate school finance structures, comparing the per pupil expenditures among school districts within a state. The framework provided a way to evaluate the equitable distribution of resources, ignoring issues related to student outcomes (Iatorola & Stiefel, 2003). In recent years, school finance experts and others interested in issues related to equity in schools have begun to focus on the uneven distribution of resources at the school level, finding the variation to be much greater within a district compared to across districts (Rubenstein & Moser, 2002). The availability of large datasets designed to collect school-level data opened the door to investigations of differences within districts, moving discussions of equity to the school-level as well (Iatarola & Stiefel).

Berne and Stiefel's (1984, 1994) equity framework consists of three standards: horizontal equity, vertical equity, and equal opportunity. Horizontal equity refers to the, "equal treatment of equals" (Berne & Stiefel, 1994, p. 406). According to this standard, all students should be provided with equivalent resources. In reference to teachers, meeting a standard of horizontal equity would require all students to be provided with teachers meeting the same qualifications and being of equal levels of quality. In contrast, the second principle, vertical equity, refers to the, "appropriately unequal treatment of unequals" (Berne & Stiefel, 2004, p. 406). This standard presumes some students need more or different resources than others to meet the same standard of achievement, for instance students from high poverty neighborhoods, students with limited English language, or highly mobile students.

The last equity principle, equal opportunity, investigates the relationship between school characteristics and some other variable, such as student achievement or resources,

where, "the absence of a relationship signifies equal opportunity," (Berne & Stiefel, 1994, p. 405). School characteristics considered by researchers include minority enrollment, geography, or poverty; such investigations seek to identify whether some resource, for instance per pupil allocations, is distributed equally among all students regardless of the school characteristics. This last principle provides a framework from which to analyze the distribution of qualified special educators in this study, replicating the framework employed by Clotfelter et al. (2007a) to evaluate the distribution of teachers and principals among North Carolina schools. Their study used school-level aggregated measures of the qualifications of teachers and principals, identifying differences in the qualifications according to poverty quartiles. They find an inequitable distribution of teachers and principals based on the concept of equal opportunity: students in high poverty schools did not have an equal opportunity to be taught by certified, experienced teachers from more competitive universities.

Replicating and extending research design used by Clotfelter et al. (2007a), this study investigated the qualifications and distribution of special educators. This purpose corresponds to research conducted in the general education literature on the distribution of teachers. To date, no similar research has been undertaken in special education regarding the distribution of special educators. Uncertainty regarding which qualifications matter and how to define teacher quality forces researchers rely on the qualifications available in state and district datasets, such as certification, experience, and preparation. Therefore, the research focusing on these variables was examined to inform the methods and analyses of the present study.

Discussions of equity in special education often focus on vertical equity as a means to justify the variety of services and supports provided to youth with disabilities in schools. While certainly a valid argument, limitations in the extent of information provided by the SASS instruments regarding the extent of instruction, number of youth provided services, and the role of the special educator to provide instruction prohibit using vertical equity as framework for this study. However, the equal opportunity framework provides a starting point for evaluating the extent to which qualified teachers are equitably distributed among schools.

Research on the Uneven Distribution

Researchers attempt to quantify the uneven distribution of teachers among schools using the comprehensive datasets available from state and district education agencies. The studies compare schools and districts based on urbanicity and other measurable differences between schools, such as the proportion of students in poverty and the proportion of minority students. These studies rely primarily on the extensive administrative records collected in New York State, New York City, and North Carolina. Table 2 presents the teacher characteristics and qualifications used in these studies that served as a model for the present investigation. The next sections describe the methods used to investigate the uneven distribution of teachers among schools.

INSERT TABLE 2 ABOUT HERE

Data from New York State. Lankford et al. (2002) utilized 15 years of data on New York's public schools to investigate the variation in teacher qualifications found among schools. School-level averages for each school year were calculated for several qualifications, including the proportion: (a) of teachers without experience, (b) with no

more than a bachelor's degree, (c) not certified in current assignment, (d) certified in all assignments, (e) who failed the state or national licensing exam on the first attempt, and (f) the competitiveness of the teacher's undergraduate program according to Barron's College Guide. Using the measures, Lankford et al. compared differences in schools, looking for variation among various labor markets, between districts, and within districts. They also investigated differences between schools based on urbanicity (urban versus suburban schools) and characteristics of the student body (nonwhite/white, high poverty versus low poverty, and high proportion limited English proficient versus low proportion limited English proficient).

Lankford et al. (2002) found "striking differences" in the variation in teacher qualifications in all of their analyses (p. 38). Many schools in New York benefited from a teaching staff in which all teachers had experience, held certification in their content area, and graduated from a competitive undergraduate program. At the same time, in schools with the highest proportions of students in poverty the faculty consisted of:

> a substantial portion of teachers who are brand new teachers (18%), who
>
> are only teaching courses for which they are not certified (24%), or who
>
> failed a certification exam on their first attempt (about one third). In some
>
> schools less than half of the teachers are permanently certified in all of the
>
> courses they teach while in other schools this figure is nearly 90% (p. 42).

Lankford et al. also found substantial differences in the qualifications of teachers among schools based on the proportion of minority students, students with limited English proficiency, and students in urban schools. Although the records used for the analysis did not include student-level achievement scores, Lankford et al. used school-level averages

on standardized assessments, finding that schools with lower scores had lesser qualified teachers.

Data from New York City. Ascher and Fruchter (2001) focused more narrowly on the relationship between teacher quality and student achievement in New York City elementary and middle schools. Using data from the 1995-96 and 1996-97 school years, three groups of schools were analyzed based on their performance on the state standardized assessment: Schools Under Registration Review (or SURR schools, the New York State Department of Education places schools in this category based on continually low scores on state assessments), low-performing schools, and high-performing schools. A fourth category representing middle-performing schools was included in the analysis, but not discussed in the manuscript. School-level measures of the teacher qualifications were calculated, representing certification status, years of experience, and advanced degrees of the faculty. Ascher and Fruchter point out that the SURR and low-performing schools served a much higher proportion of minority students (98% compared to 52% in high performing schools) and students eligible for free and reduced-price lunch (93% compared to 37% in high performing schools).

Ascher and Fruchter (2001) found statistically significant differences between the teachers from both the SURR schools and the other low-performing schools with the teachers from high achieving schools based on the teacher quality indicators. In terms of the certification status of elementary school teachers, "nearly 30% of the teachers at SURR schools (29.4%) and over a quarter at other low-performing schools (25.9%) were neither fully licensed nor permanently assigned (p. 203)." In comparison, only 7.6% of teachers in high performing schools did not have full certification or a permanent

position. In middle schools, a higher proportion of teachers were not fully licensed or permanently assigned in any of the schools, but major differences remained between high-performing schools and the lowest performing schools. Furthermore, more teachers in high-performing schools had at least five years of teaching experience and held an advanced degree.

Boyd et al. (2007) used data from the 1998-99 to 2004-05 school years to analyze the distribution of qualified teachers, including variables for the individual student characteristics, teacher qualifications and demographic information, and the school. Student information included gender, ethnicity, language spoken at home, free-lunch participation, special education status, number of absences, number of suspensions, and scaled-scores from the state assessment. Teacher qualification measures included (a) experience, (b) selectivity of the teacher's undergraduate program, (c) certification status, (d) SAT, (e) performance on teacher certification examinations, and (f) pathway to certification (a traditional preparation program, Teach For America, the Teacher Fellows Program, or the New York City Teaching Opportunity Program). Teacher demographic information included gender, age, race/ethnicity; school variables included average performance on state and city standardized assessments, free-lunch participation, race/ethnicity of the student body, and expenditures per pupil.

Over the five years investigated, the gap between schools regarding overall teacher qualifications narrowed as the number of teachers passing the state certification exam, with teaching experience, and higher scores on the SATs in the highest-poverty schools increased significantly (Boyd et al., 2007). The authors' attribute the shift to policy and programmatic changes in New York City schools. For instance, the use of

waivers for the temporary licensure of teachers in New York State was stopped in 2003, except for on a limited basis in New York City in 2004 and 2005. Also, participation in the New Teacher Project and the Teaching Fellows program, "grew from about 1 percent of newly hired teachers in 2000 to 33 percent of all new teachers in 2005," (p. 10). Using the teacher qualifications and information about student achievement scores on the state-mandated math exam, the authors developed a value-added model to test how the changes in qualifications affect student achievement. The model demonstrated a significant relationship between observable teacher qualifications, such as certification, experience, and cognitive measures, with increased student achievement among students in New York City schools.

   Data from North Carolina. Similar to studies in New York State and New York City, researchers used data from the North Carolina Department of Public Instruction to investigate the distribution of teachers among schools according to several measures of teacher qualifications (Clotfelter et al., 2005, 2006). Clotfelter et al. (2005) explored the distribution of experienced teachers across schools and across classrooms. They found a statistically significant relationship between the proportion of novice teachers and the five-year turnover rate with percentage of minority students in a school, even after controlling for district characteristics (district size, urbancity, and the proportion eligible for free and reduced-price meals).

   Comparing the variation among districts, between schools within a district, and among classrooms within a school Clotfelter et al. (2005) found that, almost two-thirds of the overall black-white difference in exposure to novice teachers reflects patterns within, rather than across, school districts in North Carolina. Within districts, novice teachers are

disproportionately assigned to the schools and to the classrooms within schools that disproportionately serve African American students (p. 391). Moreover, the analyses shed light on the disproportionate number of African American students taught in remedial courses that were more likely to be taught by novice teachers. Therefore, even if the teachers were more equitably distributed across classrooms and schools, an African American student would still be more likely to be taught by a novice teacher due to the over-representation of African American students in remedial classes and under-representation in advanced courses (Clotfelter et al., 2005).

Extending the Clotfelter et al. (2005), Clotfelter et al. (2007a) evaluated the distribution of teachers and principals among schools in North Carolina using data from 1995-2004. School-level aggregated qualification measures were compared based on school poverty quartiles to identify whether students in all schools had an equal opportunity to be instructed by a qualified individual. In addition to teacher experience, this study included school-level averages representing the competitiveness of the teacher's undergraduate program, certification type, average scores from the examination necessary for certification, and the proportion of teachers with National Board Certification (a program operated by the National Board for Professional Teaching Standards that North Carolina encourages by providing a boost in salary). Principal measures included two test scores (from subjects taught prior to becoming a principal and the School Leadership Licensure Exam), competitiveness of the undergraduate principal's institution, and a leadership rating score (based on teacher responses to a governor's office administered survey). Very little is known in respect to the qualifications of principals necessary for increased school achievement; therefore,

Clotfelter et al. relied on measures similar to those used in the teacher quality literature. The measures were used to make comparisons regarding the average teacher qualifications within a school by level of the school (elementary, middle, and high school) and the proportion of students in poverty.

Confirming previous investigations, Clotfelter et al. (2007a) found considerable differences in the qualifications of teachers and principals in low poverty schools compared to high poverty schools. Across all of the measures, teachers in the high poverty schools had weaker average qualifications. Unlike New York City, which saw increases in the average teacher qualifications over several years in all schools, in North Carolina the qualifications of teachers in high poverty schools actually worsened over the past 10 years. This pattern held for principals in high poverty schools, as well. In addition, teachers and principals in high poverty schools were more likely to leave a high poverty school after the first few years, typically transferring to a school with a lower proportion of students in poverty. In terms of the equal opportunity standard, Clotfelter et al., "conclude that the inequities with respect to the distribution of teacher and principal qualifications are large in North Carolina and that they clearly work to the disadvantage of students in the high poverty schools," (p. 31).

The studies reviewed relied on school-level, aggregated measures to summarize the average teacher qualifications available within a school. The indicator measures of teacher qualifications reflect those used most often in the teacher quality research, finding an uneven distribution of qualified teachers among schools. In special education, the problem may be even more pronounced due to chronic shortages, difficulties retaining

teachers, and a reliance on participants from ARC programs. The next sections discuss

these specific problems facing the field of special education.

The Distribution of Teachers Among Schools and School Districts

As demonstrated by the research reviewed, qualified teachers are not evenly

distributed among schools, and those considered "hard-to-staff," due to high proportions

of poor and minority students are more likely to have a staff of uncertified, novice

teachers and high rates of teacher turnover (Clotfelter et al., 2006). A number of research

organizations and policy groups, such at the Education Trust, the National Partnership for

Teaching in At-Risk Schools, and the Citizens' Commission on Civil Rights, have tried

to bring attention to this issue by highlighting the variation between schools while also

trying to understand the effect of various state and district policies (McClure, Piche, &

Taylor, 2006; National Partnership for Teaching in At-Risk Schools, 2005; Peske &

Haycock, 2006).

Possible explanations for the uneven distribution. Researchers point out that the

uneven distribution of qualified teachers among schools is due to a number of factors. For

instance, a school may respond to the preferences of district residents when choosing a

new teacher to fill a vacancy or one district may have more efficient hiring practices over

another (Lankford et al., 2002). In both cases, two schools may have access to the same

pool of teachers, and choose to employ individuals with very different characteristics.

Also, within a district, the voice of parents and administrators may influence the transfer

of a teacher of a lesser quality from a school with high parental involvement to one with

low involvement. Moreover, teachers with more experience or better qualifications often

choose to teach in schools considered preferential (perhaps due to high parental

involvement or a location in a more desirable community) or where compensation may be more enticing (Murnane & Steele, 2007). Student factors, such as the proportion of poor, minority, or immigrant children also impacts the retention of experienced teachers (Boyd et al., 2005a, 2005b; Schwartz & Stiefel, 2004). Working conditions, including salary and other non-pecuniary incentives, "such as class size and contract hours, as well as more difficult-to-measure conditions such as facilities quality, parent support, school leadership quality, collegiality within the school, and curricular autonomy," also affect a teacher's employment decision (Murnane & Steele, p. 20).

District and state policies and practices may also help to explain the uneven distribution of qualified teachers. For instance, within a district, school-choice preference is usually given to experienced teachers choosing to transfer rather than to new, inexperienced teachers (Clotfelter et al., 2007a). Experienced teachers most often choose to leave schools with higher rates of poverty and vacancies in these schools are then filled by new, inexperienced teachers (Clotfelter et al., 2007b). This leaves high poverty schools to face both high rates of turnover and high rates of novice teachers. This is troublesome due to research supporting that having at least three years of teaching experience can make a significant difference in the academic achievement gains made by students (Jacob, 2007). Taken together, sorting practices, along with shortages and teacher turnover, may limit the effectiveness of NCLB and IDEA 2004 to provide every student with a qualified teacher. However, the sorting process may affect urban and rural schools in different ways.

Distribution among urban schools. For urban schools, the problem is often not related to the absence of applications; instead, the problem comes from finding qualified

teachers to fill all positions, including positions in hard-to-staff schools. Without a pool

of qualified teachers willing to fill all positions, school administrators may hire less

qualified applicants (i.e., those with little or no experience including long-term

substitutes) or increase class sizes (Jacob, 2007). As demonstrated by Ascher and

Fruchter (2001) and Clotfelter et al. (2007a), urban schools were often filled with less

qualified teachers compared with their suburban counterparts in New York City and in

North Carolina. Particular subject areas such as math, science, and special education are

especially difficult to staff with qualified teachers (Ascher & Fruchter; Boyd et al., 2007;

Clotfelter et al., 2005, 2007a). Moreover, within an urban district the shortage may have a

varying impact, with some parts of the district not affected at all. For instance, Jacob

reported that some,

> Chicago public schools, for instance, regularly receive roughly ten
>
> applicants for each teaching position. But many of these applicants are
>
> interested in particular, highly desirable schools, and district officials must
>
> struggle to find good candidates for some highly impoverished or
>
> dysfunctional schools (p. 134).

Higher numbers of private schools within urban areas also affect the shortage of

qualified teachers willing to work in public schools, especially hard-to-staff

schools. And while some newer programs, such as Teach for America and the

New York City Teacher Fellows Program, may be helping to fill shortages,

bureaucratic hurdles and quick turnover of teachers from these programs into

more desirable schools weakens their ability to assist with maintaining an

adequate supply of qualified teachers in hard-to-staff schools (Boyd et al., 2007;

Jacob).

   Distribution among rural schools. In comparison, rural schools face very

different challenges to meet the demand for qualified teachers than in urban areas.

Although urban areas have the highest rates of poverty, the poverty rates in non-

metropolitan areas are considerably high as well (Monk, 2007). In fact, "among

the 250 poorest counties in the United States, 244 are rural, and out of the 8

million children attending public schools in rural areas, 2.5 million live in

poverty," (Monk, p. 157). In rural schools, teachers are more likely to be

inexperienced and to have graduated from a less competitive undergraduate

program compared to their peers in urban schools (Monk). Furthermore, teachers

from rural schools are more likely to complete traditional teacher preparation

programs in elementary education and less likely to take advanced math and

science courses or to hold a Master's degree, limiting their ability to be highly

qualified in these content areas (Monk).

   Complicating efforts to provide qualified special educators to all students

in rural schools are the, "combinations of poverty and higher costs owing to small

scales of operation" (Monk, p. 163). This limits the availability of the necessary

services for students with disabilities and may make working in these areas less

appealing to qualified special educators. Other dilemmas faced by rural schools

include lower salaries, higher costs of living, and smaller pools of applicants

(Monk).

Providing Qualified Special Educators to All Schools

In light of shortages in the field, the pervading focus by researchers and policymakers was on the *quantity* of special educators available, rather than examining the *quality* of the special education supply pool. Shifting the spotlight to focus on the *quality* of the special education teacher supply pool may provide evidence that the demand exceeds the supply in terms of preparation, experience, and certification (Boe & Cook, 2006; Boe et al., 1998). Furthermore, it may highlight that the problem of providing a qualified teacher is not the same in all schools. In fact, schools in urban and rural areas, especially those schools with high rates of student poverty, are especially affected by the shortage of qualified special educators. To date, little has been done in special education to inspect the qualifications of special educators at the school-level, leaving policymakers and administrators to rely on aggregated state and national level averages. The present study seeks to fill this gap by replicating and extending the studies from special education on the qualifications of special educators and from general education on the uneven distribution of teachers.

The shortage of special educators. The "chronic and increasing shortages" in special education complicates providing qualified teachers to all schools (Billingsley, 2000b; McLeskey, Tyler, & Flippin, 2003; McLeskey et al., 2004; Tyler et al., 2004). Research on teacher shortages in special education has been done using large datasets (e.g., SASS and SPeNSE) and by states and research organizations. These findings are often found in ERIC documents, on websites, or in reports (for example, Esch, Chang-Ross, Guha, Tiffany-Morales, & Shields, 2004; Fleeter & Driscoll, 2002; McDiarmid, Larson, & Hill, 2002). Shortages and attrition from special education has been

documented at considerably higher rates in rural schools, in schools with high

proportions of minority and low-income students, and in alternative settings (Brownell,

Rosenberg, Sindelar, & Smith, 2004; McLeskey et al., 2003). Furthermore, there is

evidence of teacher shortages affecting specific disability categories, such as behavior

disorders and low incidence disabilities such as mental retardation and autism, more than

other disability categories (Bowen & Klass, 1993; Lauritzen & Friedman, 1991;

McLeskey et al., 2003; Scheuermann, Webber, Boutot, & Goodwin, 2003).

During the 1998-99 school year, reports to OSEP documented that schools

employed 387,285 teachers to fill special education positions; nearly 40,000 of these

teachers were not certified by their state (USDOE, 2001).This forced administrators to fill

the remaining vacancies (approximately 10% of positions) with uncertified, and

potentially ill-prepared, teachers. In addition, a number of the teachers considered

certified actually were certified in other content areas outside of special education due to

the vagueness of the reporting requirements (USDOE). While out-of-field teachers may

be highly qualified in their respective content area, little is known about their preparation

to meet the needs of diverse learners (McLeskey et al., 2004). In addition, these teachers

may be more likely to migrate to general education positions in their field of preparation

(Boe, Bobbitt, & Cook, 1997; Boe, Bobbitt, Cook, Whitener et al., 1997).

Retaining special educators. High levels of teacher turnover affect both general

and special education in the struggle to provide every student with a highly qualified

teacher. Using data from the 1993-94 SASS, Ingersoll (2001) estimated that, "about

193,000 teachers newly entered the occupation but in the following 12 months, about

213,000-equivalent to 110% of those just hired- left the occupation" (p. 514). However,

not all of these individuals left teaching permanently; instead, a significant portion of the teachers planned to leave the classroom for only a short time while others simply moved to new schools (Ingersoll).

Popular assumptions attributed to turnover are that teachers leave to stay home and raise children or retire. However, no research exists to support these assumptions (Billingsley, 2004a). Interestingly, teachers without state certification in their content area and with less training or preparation appear to leave the field at higher rates (Billingsley; Boe, 2006). This is troublesome due to the increased emphasis on ARC programs and the reliance on out-of-field teachers in special education (Boe, Bobbitt, & Cook, 1997; Boe, Bobbitt, Cook, Whitener et al., 1997). A large proportion of teachers leave the classroom for a variety of work-related reasons, such as lack of administrative support (Billingsley). Schools with high proportions of students from ethnically diverse backgrounds and impoverished neighborhoods especially feel the impact of the high turnover among special educators (Darling-Hammond, 2000a, 2000b). These schools report greater difficulties hiring new teachers, often relying on unqualified or under-qualified teachers and long-term substitutes and report above average turnover rates (Ingersoll, 2001).

As shown with the SASS dataset, retention rates in special education are similar to the rates found in general education (Boe, Bobbitt, & Cook, 1997; Boe, Bobbitt, Cook, Whitener et al., 1997). However, more special educators choose to transfer positions, moving to a general education position, thus creating a vacancy. Administrators report difficulties filling the positions left vacant with qualified applicants due to shortfalls in

the number of special educators available in the teaching supply pool (Recruiting New Teachers, Inc., 2000; Schwartzbeck & Prince, 2003).

The role of ARC programs. Both NCLB and IDEA 2004 include statutes for ARC programs regarding their alignment with state certification policies as a way to increase the supply of teachers with content expertise. Although states are prohibited from using emergency and temporary certification, school districts can hire uncertified teachers enrolled simultaneously in an ARC program or another form of professional development that leads to state certification within three years (Mandlawitz, 2007). The ARC programs simultaneously add to the supply of available teachers while also contributing to the number of unqualified teachers in hard-to-staff classrooms (Murnane & Steele, 2007; Rosenberg & Sindelar, 2005). Many of the programs purposefully place candidates in these classrooms while they simultaneously earn a teachers' certificate (Rosenberg & Sindelar).

The proliferation of ARC programs to fill vacancies in special education calls into question the limited research base regarding their effectiveness and the inconsistent standards found among programs (Rosenberg, Boyer, Sindelar, & Misra, 2007; Rosenberg & Sindelar, 2005). Proponents point to the large number of culturally and linguistically diverse (CLD) teachers who enter through ARC programs and to the easing of shortages nationwide, especially in urban schools with high concentrations of CLD students (Shen, 2001; Tyler et al., 2004). At the school level, a major concern is the number of students taught by participants in an ARC program who enter the classroom with little to no initial preparation and who leave the local system upon gaining full certification, choosing to move to

schools considered more appealing. The constant turnover further contributes to the revolving door in schools already plagued by an over-reliance on long-term substitute and under-qualified teachers (Rosenberg et al.; Rosenberg & Sindelar).

Emerging research on participants of the Teach for America program, a well-known ARC program, finds that after the first two to three years of teaching, completers can be at least as effective as experienced, traditionally trained teachers at raising scores on state-mandated achievement tests in math and English/language arts (Boyd, Goldhaber, Lankford, & Wyckoff, 2007; Raymond & Fletcher, 2002). It is unclear whether these findings hold true for other programs, or more specifically, for other content areas including the effect of special education teachers on the academic gains of students with disabilities. Emerging research also points out that Teach for America participants often choose to leave the hard-to-staff schools within several years after completing residency requirements put in place by the ARC programs (Murnane & Steele; Peske & Haycock, 2006). This revolving door phenomenon leaves administrators in these schools with a stream of inexperienced teachers.

Summary

Defining teacher quality and providing qualified teachers to all students is a significant problem faced by state leaders, school administrators, and policymakers. Both NCLB and IDEA 2004 make clear that every student should have access to a highly qualified teacher in all core academic subjects. At the same time, stakeholders disagree over the definition of teacher quality and challenge the likelihood that all classrooms can have a teacher who meets the highly qualified standard due to shortages in the supply and high turnover rates. Evidence of the shortfall of highly qualified teachers comes from

reports of disproportionate assignment of unqualified teachers to schools with high proportions of poor, minority, and non-English speaking students (Clotfelter et al., 2007a; Clotfelter, Ladd, & Vidgor, 2005, 2007; Lankford, Loeb, & Wyckoff, 2002). In special education, the dilemma is made worse by chronic shortages and high turnover rates of teachers prepared to work with students with disabilities (Billingsley, 2004; Boe, 2006; Katsiyannis, Zhang, & Conroy, 2003; McLeskey, Tyler, & Flippin, 2004). The reliance on under-prepared teachers in schools may directly impact the academic outcomes of students in special education, especially in urban schools with high proportions of poor and minority students or in rural areas where administrators note struggles to recruit and retain qualified special educators (National Partnership for Teaching in At-Risk Schools, 2005; Peske & Haycock, 2006; Southeast Center for Teacher Quality, 2004).

Review of the research in chapter II has demonstrated that in spite of much rhetoric regarding shortages and attrition from the field, little is known about the distribution of special educators among schools. Both the NCLB and IDEA 2004 call for states to provide all students with highly qualified educators. However, state education agencies report falling short of meeting this goal, especially in high poverty schools. Research from general education confirms that teachers are unevenly distributed across schools, as certified teachers with content expertise and experience more often choose to work in schools with lower proportions of poor and minority students. We also know from research that teachers matter to student academic achievement, even amid debates regarding the specific qualifications necessary to define teacher quality. Missing from the literature is the extent to which the supply of special educators holds these qualifications

and whether all students have the same opportunity to be taught by qualified special education teachers.

The present study updates and expands the previous research describing the qualifications of special educators (Billingsly, 2002; Boe & Cook, 2006; Boe et al., 2007). It also borrows from the studies in general education that have examined the uneven distribution of teachers using variables from the research teacher qualifications and the research on the teacher effectiveness (Clotfelter et al., 2005, 2007b; Lankford, Loeb, & Wyckoff, 2002). These variables include teacher experience, selectivity of undergraduate institution (as a proxy for verbal ability), licensure type, and attainment of an advanced degree. In special education, teacher quality measures used to describe the supply of teachers have included certification area, a degree in special education, and completing coursework typical of teacher preparation programs. Variables for this study used similar measures of teacher qualifications to evaluate the distribution of special educators. Similar to the Clotfelter et al. (2007a) study, the equal opportunity principle was used to evaluate inequities in the distribution of teachers to schools. Additionally, several qualification measures were taken from the special education literature.

This study fills the gap in the research literature on the relationship between special education teacher qualifications and school characteristics, providing stakeholders the necessary information to develop policies and programs to make available to all students a qualified special educator. First, a descriptive profile of the qualifications of the sample of full and part-time special education teachers in the 2003-04 administration of the SASS:04 is presented. Second, the distribution of special education teachers among

the k-12 public schools in the SASS:04 sample is explored in terms of the urbanicity and

proportion of students in poverty within a school.

CHAPTER III

Data and Methodology

The purpose of this study was to provide a descriptive profile of a sample of the special education teachers in the 2003-04 administration of the SASS (SASS:04) and to examine how the qualifications of special education teachers in the SASS:04 sample varied among K-12 public schools according to the urbanicity or proportion of students in poverty within a school. The teacher qualifications profiled included: (a) amount of teacher preparation, (b) degree major in special education or other education (undergraduate or graduate), (c) degree level (undergraduate and/or graduate), (d) certification in special education, (e) certification in education, (f) type of preparation program, and (g) teaching experience. The study is intended to fill the gap in the research pertaining to the relationship between special education teacher qualifications and school characteristics in order to assist stakeholders to develop more effective policies and programs aimed at providing all students with a qualified special educator.

In this chapter, I first describe the SASS:04 study purpose, sampling design, instruments, sampling weights, and procedures for missing data. The second section provides a rationale and description of the variables that were included in this study. The methodology for identifying the analytic sample and the statistical procedures follow in the third section.

The SASS:04 Dataset

Since the 1980s, the NCES has administered the SASS, which is a series of questionnaires designed to provide a comprehensive picture of the state of schooling in the U.S. (Tourkin et al., 2007). The SASS:04 marks the fifth time the survey has been administered to three sectors: public schools (including charter schools), private schools,

and BIA funded schools (Tourkin et al.). This is done by using five linked questionnaires

completed by teachers, school administrators, and others knowledgeable about school and

district policies. Additionally, the SASS:04 public school databases can be supplemented

with other NCES databases, including the Common Core of Data (CCD) and the NAEP

to provide information on school funding, attendance, geographic codes, and

performance on academic achievement measures. Figure 1 displays the questionnaires

administered as part of SASS:04 for public and private schools; the surveys in italicized

typeface represent the surveys used in this study.

The NCES makes available two datasets based on the SASS questionnaires. The

first allows interested individuals to download data files directly from the NCES website.

The second is a restricted-access database, which requires institutional licensure. The

restricted-access database includes complete responses, person-identifiable information

from respondents, and a series of sampling weights. This analysis used the restricted-

access version of the SASS:04 dataset.

INSERT FIGURE 1 ABOUT HERE

*Sample Selection for Public Scho*ols

My analyses utilized response information from only the public school sector of

the SASS:04 to describe the distribution of qualified special educators among public

schools, a priority made clear by NCLB and IDEA 2004. Therefore, survey design and

other relevant information are provided for the public school sector only. More

information about the private schools included in the SASS:04 is provided at the NCES

website. Additional information regarding how NCES selected schools to include in the

SASS:04 dataset is in appendix A.

Prior to data collection, NCES contacted district administrators through phone calls, mailed postcards, and letters to identify any one-school districts and to identify any districts with formal approval processes related to research (Toukin et al., 2007). At the same time, field staff from the Census Bureau sub-contracted by NCES for the SASS:04 data collection process began contacting schools to set-up interview times with administrators. The field staff worked with their assigned schools throughout the data collection time frame to ensure adequate response rates. From the full sample of schools surveyed, 80.5% completed the School Questionnaire, yielding a sample of 10,202 public schools.

Sampling Strategy for Selecting Teachers

Field staff from the Census Bureau determined which teachers to include in the SASS:04 dataset following prescribed sample identification procedures. At the beginning of data collection, the field staff met with school administrators to explain the purpose and design of SASS:04 and to obtain teacher rosters. From the roster, the field coordinator followed prescribed procedures to ensure adequate representation of new teachers and teachers of Asian and Hispanic descent. More specific information on the sampling procedures for teachers is included in appendix B. From the sampled schools, 53,188 teachers were selected to participate in the public school teacher sampling frame; of which, 84% completed the questionnaire (N= 43,244; Tourkin et al., 2007).

Instrumentation

The SASS:04 used five questionnaires to gather data including: (a) the School District Questionnaire, (b) the Principal Questionnaire, (c) the School Questionnaire, (d) the Teacher Questionnaire, and (e) the School Library Media Center Questionnaire

(Tourkin et al., 2007). Two of the questionnaires, the Teacher Questionnaire and the School Questionnaire, were selected for this study because they contain information about the teachers and their respective schools. In districts with only one school, respondents were asked to complete the Unified School Questionnaire, combining questions from both the District Questionnaire and the School Questionnaire to reduce redundancy of questions. The questionnaires were downloaded from the SASS:04 website: http://www.nces.ed.gov/surveys/sass.

Teacher Questionnaire. Prior to the 2004 administration of the SASS, the NCES in coordination with the Census Bureau conducted preliminary studies to improve the survey questionnaires (Tourkin et al., 2007). Preparation for the Teacher Questionnaire included cognitive interviews with panel groups and telephone interviews with randomly chosen teachers. Feedback from participants provided clarification for problematic questions from the previous administration of SASS and supplied an opportunity to try new items under consideration for the SASS:04.

In the panel group studies, representatives from the Census Bureau conducted cognitive interviews from December, 2002 through February, 2003. The interviewers followed an interview protocol, but could deviate from the protocol when appropriate. Based on the interviews, several questions needed additional revisions, including the questions related to certification, hours worked at school, and the use of standardized tests. Appendix E in the SASS:04 documentation includes the research methodology and specific findings from the panel studies (Tourkin et al., 2007).

Following the panel interviews, the Census Bureau representatives conducted a series of follow-up telephone interviews with randomly selected teachers in March, 2003

(Tourkin et al., 2007). Draft copies of the questionnaire were faxed to selected teacher for review. The drafts included tentative revisions to questions regarding certification, type of preparation, and source of degree. During the telephone interviews, the interviewer followed a structured protocol but again was allowed to deviate from the script. The Census Bureau identified from the interviews that the questions related to teacher certification questions continued to need further revision. Appendix F from the SASS:04 documentation includes the research methodology and specific findings from the interviews (Tourkin et al.).

The Teacher Questionnaire consisted of more than 80 questions within eleven sections, including: (a) General Information; (b) Class Organization; (c) Educational Background; (d) Certification and Training; (e) Professional Development; (f) Resources and Assessments of Students; (g) Working Conditions; (h) Decision Making; (i) Teacher Attitudes and School Climate; (j) General Employment Information; and (k) Contact Information. As the focus of this study was to provide a descriptive profile of the qualifications of special education teachers from the SASS:04 sample, the most relevant information came from five of the sections: General Information, Class Organization, Educational Background, Certification and Training, and General Employment Information. Appendix C lists the questions from the Teacher Questionnaire utilized in this analysis.

In the General Information and Class Organization sections teachers were asked to report on their current teaching position, including the grade level and subject(s) they teach, and about their teaching experience. The Educational Background section asked teachers to provide information on undergraduate and graduate schooling, including the

type of degree and where it was obtained. Respondents were asked to identify a major field of study for each of the degrees obtained from a list of 81 potential majors. Questions about participation in national or state exam related to teaching were included, along with questions about completion of coursework related to teaching, such as educational psychology or teaching methods. Information on undergraduate and graduate programs, certification, and teaching experience were used in this analysis.

The section on Certification and Training questioned respondents about the various content areas and grade levels in which they hold certification. The questionnaire provided 82 certification content area codes for respondents to choose from. The section also included several questions for new teachers regarding their feelings of preparation during their first year of teaching. The General Employment section included questions about current salary, jobs outside of teaching, participation in union activities, and for demographic information. For this analysis, the demographic information were used to describe the age, gender, and race of the analytic sample.

School Questionnaire. Similar to the preliminary studies conducted for the Teacher Questionnaire, the NCES conducted preliminary analyses of the School Questionnaire, including focus group discussions and cognitive interviews (Tourkin et al., 2007). Four focus groups examined problematic questions from the 1999-2000 administration of SASS, reviewed new questions to be added to the SASS:04, and discussed methods for increasing response rates in March and April of 2003. The focus groups included principals and "other knowledgeable persons" from the schools (such as school secretaries who might be responsible for completing the School Questionnaire; Tourkin et al.). Findings from the focus groups included the need to gain support from

district administrators in order to increase participation, clarification as to how to word questions related to overcrowding and free- or reduced-price lunch programs, and the movement of certain questions to the Principal or the District Questionnaires, rather than the School Questionnaire. Appendix G from the SASS:04 documentation provides details on the methodology and the findings (Tourkin et al.).

Based on the feedback from the focus groups, the Census Bureau representatives conducted twelve cognitive style interviews with principals (Tourkin et al., 2007). Following an interview protocol, the interviewers used concurrent think-aloud and retrospective probing techniques to revise questions based on the focus groups. Findings included additional clarification of questions regarding daily attendance, the presence of kindergarten classes, and school capacity. Complete findings and information on the research methodology can be found in Appendix H of the SASS:04 documentation (Tourkin et al.).

The School Questionnaire consisted of approximately 72 questions divided into seven sections, including: (a) General Information; (b) Admissions, Programs, and Performance; (c) Student and Class Organization; (d) Staffing; (e) Technology; (f) Special Programs and Services; and (g) Charter School Information (if relevant). Information on the proportion of students eligible for the NSLP and the physical location of the school comes from the General Information and the Special Programs and Services sections.

In the General Information section, respondents were asked to provide information about school enrollment, including the grades offered, number of students enrolled, and the race/ethnicity of the students. There were also questions about the use of

temporary buildings and other instructional spaces and whether there is a kindergarten at the school. The Programs and Services section asked the respondent to provide information about the proportion of students in the school eligible for federally funded programs, including National School Lunch Program (NSLP), Title I, special education, and programs for students with limited English proficiency. Appendix D lists the questions from the School Questionnaire used in this study.

Sampling Weights

The complex survey design of the SASS:04 required the construction of sampling weights; this enables researchers to generalize findings to the full population under study (Thomas, Heck, & Bauer, 2005). The SASS:04 dataset includes several weights to account for the stratified sampling design and the over-sampling of a number of subgroups, permitting generalization at different levels, including teacher, school, and district (for instance, new teachers or schools in rural areas). Determining which weight to apply is based upon the unit of analysis in the research study; for instance, public school administrators or private school teachers. In this study, the unit of analysis was the teacher; therefore, the teacher weights were employed (TFNLWGT). The final weight for public school teachers was the product of: (a) the initial basic weight (the inverse of the probability of selection of the teacher at the time of selection); (b) a sampling adjustment factor (this reflects the probability a school would be selected into the sample); (c) the teacher list nonresponse adjustment factor (this accounts for schools selected who did not provide a teacher listing); (d) a teacher-within-school nonresponse adjustment factor (an adjustment for teachers selected who did not respond to the survey); (e) a first-stage ratio adjustment factor (this adjusts for sampled schools' estimates to the whole school

sampling frame); and (f) the teacher adjustment factor (this adjusts any to any inconsistencies between the school data files and teacher data files). The weight provided by NCES needed to be normalized since the analyses focused on a subgroup of the full sample of teachers (NEWTWGT). Normalizing the weights preserves the degrees of freedom which may otherwise become over-inflated, causing bias in the estimates of error (R. Croninger, personal communications, September 25, 2006).

Missing Data

The SASS:04 is a completely imputed dataset; questions left unanswered by respondents were filled in by NCES staff members following specified procedures (Tourkin et al., 2007). Each stage introduced additional assumptions into generating a complete response set. Within the dataset researchers can look for imputation "flags," notations left by the NCES staff members to mark which imputation procedure was followed. Imputation was conducted in three stages depending on the availability of matching data from other sources, such as other questionnaires or schools of a similar size and composition. At the first stage, responses were imputed based on questions from the same questionnaire, other SASS:04 questionnaires, or from the 2001-02 CCD. The second stage required more technical approaches, such as using donor records and hot-deck imputation, regression imputation, or subsample ratio imputation. At the third stage, the Census Bureau analysts imputed answers to the questions by hand based on other records and available information (Tourkin et al.). Information on stages of imputation for each variable is available in the SASS:04 Documentation (see Appendix Q in Tourkin et al., 2007).

Variables

This study provided a descriptive profile of the qualifications of special educators in the SASS:04 dataset using seven variables to measure teacher qualifications. The qualifications included amount of teacher preparation, degree major in special education or other education program (undergraduate or graduate), degree level, certification in special education, certification in education, type of preparation program, and years of teaching experience. The qualification variables closely align with variables used in previous studies to describe the qualifications of special educators (Boe et al., 2007) and to describe the distribution of teachers among public schools (Ascher & Fruchter, 2001; Boyd et al., 2007; Clotfelter et al., 2007a). The variables representing teacher qualifications, demographic characteristics, teaching positions, and school characteristics used in the analysis are described in this section.

Teacher Qualifications

Amount of teacher preparation. Boe et al. (2007) divided teachers from the 1999-2000 SASS into three levels based on the amount of time spent in student teaching and the extent to which the teachers completed four components common to traditional pre-service preparation programs (extensive preparation, some preparation, no preparation). The components included: (a) coursework in selecting and adapting instructional material; (b) coursework in educational psychology; (c) observation of others' teaching; and (d) received feedback of teaching during preparation. The SASS:04 Teacher Questionnaire included similar questions, enabling this variable to be reproduced in this study. However, the respondent answer options for length of practice teaching changed since SASS:99, forcing the operational definitions to be adjusted. Table 3 operationally

defines the three groups, comparing the Boe et al. definition to the categories used for this analysis. Extensive teacher preparation included at least eight weeks of practice teaching and at least three of the four components of teacher preparation. In comparison, an individual with some preparation might have fewer weeks of practice teaching but some of the components of teacher preparation, or vice versa. The category of little or no preparation is reserved for individuals with minimal weeks of practice teaching and a few or no components of teacher preparation. This variable was used in both the descriptive analysis and in the logistic regression analysis.

INSERT TABLE 3 ABOUT HERE

Degree major in special education or other education program. The Teacher Questionnaire asked respondents to provide information on completion of bachelor's degrees, master's degrees, and other advanced degrees. Respondents indicated the major program area of the degree, year received, and name of the institution. The SASS:04 lists 86 different program areas from which the respondent may choose (see appendix E for the entire list).

In this study, sampled teachers were divided into three groups based on the major field of study codes at either the undergraduate or graduate level, similar to the coding used in Boe et al. (2007). The variable ranked teachers in terms of formal preparation with teaching students with disabilities, such as completing a bachelor's or master's degree in special education. Group one included teachers with at least one degree in special education; group two were teachers with at least one degree in general education (either elementary or secondary education), but no degree in special education; and group three included all other teachers in the subsample (those without teacher preparation at

any degree level). This variable was used in both the descriptive analysis and in the logistic regression analysis.

Degree level. This was a dichotomous variable based on whether a teacher in the analytic sample has an advanced degree. Boe et al. (2007) and Clotfelter et al. (2007a) constructed similar variables, alluding to the disagreement among researchers as to the value of graduate degrees. It was used in both the descriptive analysis and in the logistic regression analysis (0= master's degree or higher, 1= bachelor's degree or less).

Certification in special education. The SASS:04 asked respondents to indicate the types of certification they hold in their current state of employment. The Teacher Questionnaire included 82 certification content area codes, including 15 codes related to special education (Appendix F lists the content area codes). Respondents could provide information about two separate teacher certificates, including up to five different areas of certification for each of the certificates (variables t0166 and t0188).The questionnaire also asked respondents to indicate the type of the teacher certification for each (regular, probationary, provisional, temporary, emergency, or no certification). In this study, the information from SASS:04 was used to designate whether the teacher is either fully certified in special education (including regular, provisional, and probationary certificates) or not certified in special education combining the special education categories into a single category. Teachers that indicated possessing a temporary or emergency certificate were not included even if it was in special education. Combining all types of special education certification into a single category was done due to the exploratory nature of the study and the inability to connect the special education teachers to the types of students they work with in the classroom. The dichotomous variable was

dummy coded (0= full certification in special education; 1=not certified in special

education). This variable was used in both the descriptive analysis and in the logistic

regression analysis.

     Certification in education. A separate variable was constructed to indicate

whether a respondent held certification in any content area. Constructing this variable

was based on the same information from the Teacher Questionnaire as above. The

dichotomous variable was used in both the descriptive analysis and in the logistic

regression analysis (0= full certification in education, any; 1=not certified in education,

any).

     Type of preparation program. A variable was constructed to indicate the type of

preparation program a respondent completed. The Teacher Questionnaire included a

question regarding where the teacher received training in teaching methods or teaching

strategies (t0159). Choices include (a) through an "alternative" program designed to

expedite the transition of non-teachers to a teaching career, (b) through a bachelor's

degree granting program, (c) through a fifth year program, (d) through a master's degree

granting program, (e) through individual courses, and (f) other, which requried

respondents to write-in a description of their program. Some of the respondents may have

a valid skip to this question if they indicated not ever taking courses in teaching methods

or teaching strategies to a previous question. For the this analysis, I combined the

responses into three categories: (a) completed a traditional or degree-focused program

(combining individuals who completed a bachelor's degree, master's degree, or a fifth

year program and some of the "other" responses), (b) completed an alternative or non-

traditional program (combining alternative program, individual courses, and some of the

"other" responses), and (c) no program (combining the valid skips with some of the responses from the other category). Responses marked "other" were analyzed and recoded into one of the categories (see appendix G for an explanation of the recoding methodology). This variable was used in both the descriptive analysis and in the logistic regression analysis.

Years of teaching experience. The Teacher Questionnaire asked respondents to indicate the number of years spent teaching full or part-time in either public or private schools. From the responses, the SASS:04 created a variable representing total teaching experience (TOTEXPER). For this study, I followed the method used by Clofleter et al. (2006) to create a dichotomous variable. It was dummy coded to represent the amount of teaching experience (0= more than 3 years of experience; 1= 3 years or less). This variable was used in both the descriptive and logistic regression analyses.

Teacher Characteristics

Age. The Teacher Questionnaire asked the respondent to indicate their year of birth (t0416). The SASS:04 staff used the year of birth to create a variable to indicate the teacher's age in 2003 (AGE_T). A continuous variable, it was recoded into a categorical variable to describe the age variation in the sample similar to the method used by Boe, Bobbitt, Cook, Whitener et al. (1997). The recoded variable had four groups, (a) teachers ages 21 to 30, (b) teachers from age 31 through 40, (c) teachers from age 41 through 50, (d) teachers over age fifty-one. This variable was used in both the descriptive and logistic regression analyses.

Gender. The Teacher Questionnaire asked respondents to indicate their gender (1= male; 2= female). The variable (t0408) was dummy coded with females as the base

group since the teacher workforce is predominantly female overall (0= female, 1= male). This variable was used in both the descriptive and logistic regression analyses.

Race/ethnicity. The SASS:04 Teacher Questionnaire included two separate questions related to race/ethnicity. The first question asked respondents to indicate whether he or she is of Hispanic origin (1=yes, 2=no). The second question asked respondents to indicate their race, allowing him or her to mark the one or more races as appropriate from the five options (white, black or African American, Asian, Native Hawaiian or Other Pacific Islander, and American Indian or Alaska Native). The SASS:04 staff used information from both of these questions to create the variable RACETH_T, creating 62 different race/ethnicity codes. The published results of SASS:04 collapsed the codes into two different stratifications following statistical standards prescribed by NCES (NCES, 2003; Strizek et al., 2006). The first combined race/ethnicity into seven different categories: (a) white, non-Hispanic, (b) Black, non-Hispanic, (c) Asian, non-Hispanic, (d) American Indian/Alaska Native, non-Hispanic, (e) Native Hawaiian or Other Pacific Islander, non-Hispanic, (f) Hispanic, single or multiple races, and (g) Multiple races, non-Hispanic. The second stratification divided the sample of teachers into two groups, white, non-Hispanic or minority, combining the remaining categories. For the descriptive analysis, I used both methods to describe the race/ethnicity of special educators in the analytic sample. The limited number of participants in the race/ethnicity categories other than white, non-Hispanic, compelled me to use the two-category variable for race/ethnicity for the remainder of the analyses.

Teaching Positions

Assignment. Respondents to the Teacher Questionnaire were asked to indicate their current teaching position (variable t0026). Eleven different options were provided: (a) regular full-time teacher, (b) regular part-time teacher, (c) itinerant teacher, (d) long-term substitute, (e) short-term substitute, (f) student teacher, (g) teacher aide, (h) administrator, (i) library media specialist or librarian, (j) other professional staff, and (k) support staff. The first four teaching positions were used to investigate differences in teacher qualifications (regular full-time teacher, regular part-time teacher, itinerant teacher, and long-term substitute). An itinerant teacher is defined by NCES as an individual who, "teaches at more than one school; for example a music teacher who teaches 3 days per week at one school and 2 days per week at another" (Tourkin et al., 2007, p. A-6). A long-term substitute teacher is defined as an individual, "who fills the role of a regular teacher on a long-term basis" (Tourkin et al., p. A-6). In this investigation, the TEACHASSIGN variable had three categories: (a) regular full or part-time teacher, (b) itinerant teacher, and (c) long-term substitute teacher. It was used in the descriptive subgroup analysis and the logistic regression analysis.

School level. On the School Questionnaire respondents indicated which grade levels are offered in the school. Options range from kindergarten through twelfth grade, along with an option of "ungraded." The NCES recoded this variable in two ways: SCHLEVE2 and SCHLEVEL. The first variable (SCHLEVE2) is a four-category variable, including primary, middle, high, and combined levels. The second variable (SCHLEVEL) uses only three categories: elementary, secondary, and combined. Table 4

compares the two methods for categorizing schools by grade levels. I used the

SCHLEVE2 variable for the descriptive subgroup analysis.

INSERT TABLE 4 ABOUT HERE

School Characteristics

There were two variables used in this study to characterize the schools in which

the analytic sample chooses to teach. The first represented the proportion of students in a

school who participated in the NSLP, the federal free and reduced-price meals program, a

measure commonly used in research as a proxy for student poverty. The second was

urbanicity of the school based on information from the 2000 Decennial Census and

included in the SASS:04 dataset.

School poverty. Students from families with incomes less than 130% of the

federal poverty line are eligible for NSLP. Although this may inflate the total number of

youth in poverty, it is a common method used in research to measure school poverty

(Clotfelter et al., 2007a). Another limitation of relying on NSLP information is the

reluctance of older students to submit the proper paperwork, often deflating the eligibility

rate for NSLP in the upper grades (Clotfelter et al.). Despite the limitations, it is the best

method for estimating school poverty available in the SASS:04 dataset. The School

Questionnaire asked respondents to indicate whether their school participates in the

NSLP (variable s0632). Respondents who answered "yes," must then indicate the number

of students in the school eligible for the program around the first of October (variable

s0634). The SASS:04 staff used this response information to create the variable

NSLAPP_S to represent the percentage of students in a school eligible for free and

reduced-price meals. School respondents who marked "no," they do not participate in

NSLP, were coded by staff as an acceptable skip. These schools were recoded to indicate zero students eligible for the NSLP in this study.

The schools in the analytic sample were then ranked according to the proportion of students eligible for NSLP and divided into quartiles. Quartile four represented high poverty schools, while quartile one represented low poverty schools. Schools in quartile one had fewer than 17% of students eligible for NSLP, compared to more than 60% of the students eligible in quartile four. Table 5 provides information on number of schools in each quartile by level of the school and the proportion of schools it represents from the analytic sample. For the descriptive analysis, all four quartiles were inspected to analyze differences in teacher qualifications, but the discussion focused on differences between the extreme ends of the distribution. However, the logistic regression analysis looked specifically at schools in the high poverty schools compared to all other schools to expose the significant differences found in the qualifications of special education teachers in these schools.

INSERT TABLE 5 ABOUT HERE

Urbanicity. The NCES included in the SASS:04 dataset a variable from the CCD based on the 2000 Decennial Census information to indicate the urbanicity of a school's physical location relative to the populous area (LOCALE03 in the CCD; SLOCP_03 in SASS:04). There are eight categories based on the Core Based Statistical Area, as designated by the Census Burea (for more information, see http://www.census.gov/population/www/estimates/aboutmetrol.html) . Table 6 defines the eight categories.

INSERT TABLE 6 ABOUT HERE

To simplify the analysis, a three-category variable was used to describe urbanicity in this study. The NCES-created variable URBANS03 recodes the eight category designations into three groups. The categories incude (a) urban schools, including large or mid-size central cities (SLOCP_3= 1,2), (b) suburban schools, including urban fringe or mid-size central city and rural, inside CBSA (SLOCP_3= 3,4,5,8), and (c) rural schools, including small town/rural and rural, outside CBSA (SLOCP_3= 6,7). Figure 2 portrays the categorization of schools according to their phycsial location and the number of schools from each category. For the descriptive analysis, all three urbanicities were inspected to analyze differences in teacher qualifications. In the logistic regression analysis, two separate models looked specifically at the differences in teacher qualifications by urbanicity. The first model analyzed teacher differences in urban schools compared to all other schools; the second model analyzed teacher differences in rural schools compared to all other schools.

INSERT FIGURE 2 ABOUT HERE

Methodology

This section provides details about the methodology used in the analyses, including how the analytic sample of special education teachers were identified from the SASS:04 dataset.

Identifying Special Educators

Identification of the analytic sample came from data on the Teacher Questionnaire using two different variables: t0026 and ASSIGN03. First, I identified the teaching assignments from the full sample of teachers in the SASS:04 using variable t0026. This variable indicated the teachers' current teaching assignment based on an early question in

the Teacher Questionnaire. Eleven different options were provided; acceptable options

for inclusion in the sample included: full-time and part-time teachers, itinerant teachers,

and long-term substitute teachers. An additional question clarified whether

administrators, school librarians, and teacher aides actually teach regularly scheduled

classes to determine their inclusion. Respondent indicating positions as short term

teachers, student teachers, and instructional aides were instructed to stop and return the

questionnaire to the field representative. Table 7 shows the number of teachers reporting

the various positions for both the full sample of teachers in SASS and for the special

educators in the analytic sample. Long-term substitute teachers and itinerant teachers

were included in the sample due to evidence from the literature that the large number of

vacancies in special education in schools with high proportions of poor and minority

students and rural schools often forces administrators to rely on these individuals to fill

teaching vacancies.

INSERT TABLE 7 ABOUT HERE

After eliminating individuals based on their teaching assignment, the second

variable used to identify special educators reflected the main subject area or grade level

of instruction. This decision was made using the NCES created a variable representing

the main teaching assignment recorded by respondents (ASSIGN03). Other teaching

assignment options included elementary education and subject matter specific areas, such

as arts and music, health education, mathematics and computer science, and social

sciences. Appendix E provides a full listing of the available teaching assignment and

subject matter codes available to respondents. Table 8 provides the number of special

educators by teaching assignment to be included in the analytic sample (N=5,263). The

table includes the frequency of positions both with and without the sampling weights applied. With the weights applied the frequencies better represent national estimates of the teaching supply; for special educators, the weights indicate a greater proportion of long-term substitute teachers and itinerant teachers in the supply than actually included in the sample.

INSERT TABLE 8 ABOUT HERE

Analyses

I used two types of analyses in this study: univariate and bivariate descriptive analysis and logistic regression analysis. Bivariate descriptive statistics were used to analyze research questions one and two. Logistic regression was used to analyze research question three. The appropriate weights for a teacher-level analysis, re-centered for this analysis, were applied.

Descriptive univariate and bivariate statistics. For the first two research questions, univariate and bivariate descriptive analyses were conducted to measure associations among variables.

Research question 1: What are the characteristics of the special education teachers in the SASS:04 sample in terms of measures of teacher qualifications (amount of teacher preparation, degree major in special education or other education, degree level, certification in special education, certification in education, type of preparation program, and teaching experience)? Do the qualifications vary among teachers according to: (a) demographic characteristics (gender, age, and race/ethnicity), or (b) teaching position (teaching assignment and school level)?

Research question 1 provided a profile of the sample of special education teachers from the SASS:04 dataset according to five subgroups to investigate differences in the qualifications according to demographic characteristics or teaching position. Contingency tables, including frequencies and percentages, were constructed to identify the differences in teacher qualifications among the different subgroups. To better understand the relationship between the variables, bivariate descriptive analyses were conducted, including chi-square analyses and two measures of association (Cramer's V and Goodman and Kruskal's *tau*).

Research question 2: How do the qualifications of special education teachers in high poverty schools compare to the qualifications of special education teachers in low poverty schools? How do the qualifications of special education teacher vary across different urban areas (large or mid-size central city, urban fringe of large or mid-size central city, small town/rural)?

For research question 2, a description of how the qualifications of teachers varied among schools according to poverty or urbanicity is presented. Frequencies and percentages were tabulated for the qualifications of special educators within each subgroup (i.e., high poverty schools, small town or rural schools, etc.) using contingency tables. Comparisons across cells within the contingency table were conducted using chi-square analyses to test for statistical significance. Cramer's V and Goodman and Kruskal's *tau* were analyzed to measure the association between the variables.

Logistic regression analysis. The third question used logistic regression to investigate the relationships among the teacher qualification variables and either the poverty quartile or the urbanicity of the school in which the individual teaches.

Research question 3: Do special education teachers in (a) high poverty schools, (b) urban schools, (c) rural schools, meet the same qualifications as special education teachers in other schools?

Logistic regression models the probability that some event will occur, based on a series of independent variables (Huck, 2004). For this analysis, the dependent variables were the school characteristics defined in the variable section (high poverty, urbanicity). Three separate models were developed to explore the relationship. One logistic regression model inspected the probability of a qualified special educator teaching in a high poverty school; two separate logistic regression models were tested to inspect the probability of a qualified special educator teaching in either an urban school or a rural school. In all three models, the dependent variable was coded as either high poverty, urban, or rural schools. The odds ratios were inspected and appropriate tests of significance applied at the .05 level.

Within the model, variables were entered in a stepwise fashion to allow inspection of how the variables contributed to the overall model formation. First, demographic characteristics were added (age, gender, and race/ethnicity). Next, variables related to their formal preparation were added (amount of preparation and degree major). Step three added the certification variables into the model (certification in any area and certification in special education). Step four added the last three variables: type of preparation program, degree level, and years of teaching experience. All variables were dummy-coded to represent the level of interest.

Equation 1

Model for Logistic Regression to Explore the Probability of a Qualified Special

Education Teacher Working in a High Poverty School

Log-odds $(Y=1)= b0 + b_1X_1 + b_2X_2 + \ldots b_nX_n$

1= High Poverty Schools

Step 1	Age	Age	Age	Age
	Female	Female	Female	Female
	White	White	White	White
Step 2		Extensive Prep	Extensive Prep	Extensive Prep
		Degree- Sp Ed	Degree- Sp Ed	Degree- Sp Ed
Step 3			Cert- Sp Ed	Cert- Sp Ed
			Cert- Gen Ed	Cert- Gen Ed
Step 4				Trad Prep Prog
				MA+
				Yrs Teaching

Equation 2

Model for Logistic Regression to Explore the Probability of a Qualified Special

Education Teacher Working in an Urban School

Log-odds $(Y=1) = b0 + b_1X_1 + b_2X_2 + \ldots b_nX_n$

1= Urban Schools

Step 1	Age	Age	Age	Age
	Female	Female	Female	Female
	White	White	White	White
Step 2		Extensive Prep	Extensive Prep	Extensive Prep
		Degree- Sp Ed	Degree- Sp Ed	Degree- Sp Ed
Step 3			Cert- Sp Ed	Cert- Sp Ed
			Cert- Gen Ed	Cert- Gen Ed
Step 4				Trad Prep Prog
				MA+
				Yrs Teaching

Equation 3

Model for Logistic Regression to Explore the Probability of a Qualified Special

Education Teacher Working in a Rural School

Log-odds $(Y=1) = b0 + b_1X_1 + b_2X_2 + \dots b_nX_n$			
1= Rural Schools			

Step 1	Age	Age	Age	Age
	Female	Female	Female	Female
	White	White	White	White
Step 2		Extensive Prep	Extensive Prep	Extensive Prep
		Degree- Sp Ed	Degree- Sp Ed	Degree- Sp Ed
Step 3			Cert- Sp Ed	Cert- Sp Ed
			Cert- Gen Ed	Cert- Gen Ed
Step 4				Trad Prep Prog
				MA+
				Yrs Teaching

In logistic regression the independent variables can be either categorical or continuous, and do not need to be normally distributed. This allowed the measures of teacher qualifications to be used in the models. Although variables within a logistic regression model do not need to meet the rules of a normal distribution, there are other concerns that I needed to consider. All categorical variables were recoded as indicator (dummy) variables with the base category coded zero to allow it to serve as a reference group (Field, 2000). Within the model, correlations between individual variables and

tolerance statistics were inspected for multicollinearity. Also, variables were inspected for the likelihood of a suppressor variable.

Logistic regression is an iterative, listwise procedure that provides results at each stage of the model development (R. Croninger, personal communications, November 13, 2006). Each model demonstrated a particular qualification as it relates to the school. Within each model, the log odds were inspected to determine the likelihood of a teacher in a high poverty/urban /rural school having a particular qualification. Also, the changes in the log odds were interpreted to verify if there is a significant change by adding additional qualifications. At each level of the model the -2 log likelihood and other goodness of fit statistics (model chi-square, Hosmer and Lemeshow Test, classification tables) were inspected to make sure the additional variables helped to better explain the probability of a qualified teacher working in a high poverty/urban/rural school. The odds ratios are reported for this analysis.

Statistical Software for Analysis

The SPSS 15.0 software program was used to store the database and conduct the analysis of all three research questions.

Summary

The SASS:04 dataset provided an opportunity to inspect the characteristics and qualifications of a nationally representative sample of special educators at the time of the reauthorization of IDEA 2004. The teacher qualification indicators replicate those used in other special education and general education research on the teaching supply. However, this study extends the literature by providing a description of the distribution of special education teachers by several relevant subgroups and among high poverty, urban, and

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rural schools. Univariate and bivariate descriptive statistics and logistic regression were

used.

CHAPTER IV

Analyses and Findings

The purpose of this study was to provide a descriptive profile of the special

education teachers in the 2003-04 administration of the SASS (SASS:04) and to examine

how the qualifications of special education teachers in the SASS:04 sample varied among

K-12 public schools according to the urbanicity and proportion of students in poverty

within a school.

This chapter presents the findings related to each of the research questions. I

begin with a description of the demographic characteristics of the analytic sample. For

the analysis, I applied the teacher weight supplied by NCES, re-centered to account for

using only a portion of the full sample of teachers. For research questions one and two I

report frequencies and column percents, followed by the results of the chi-square

analyses and additional follow-up measures of association (i.e., Cramer's V and

Goodman-Kruskal *tau*). The third research question required the use of logistic

regression; odds ratios are discussed and other pertinent statistics are presented (i.e.,

Wald statistic, odds, and standard errors).

Characteristics of the Analytic Sample

The demographic characteristics of the analytic sample (N= 5,263) was examined,

providing descriptive information regarding the age, gender, and race/ethnicity of the

special educators in the SASS:04 sample (see Table 9). The majority of special educators

were white, non-Hispanic (83.4%), female (84.2%), and in their 40s and 50s (58.0%).

The underrepresentation of male and minority teachers in the analytic sample is

comparable to other research findings on the special education teaching supply (Brownell

et al., 2002; Carlson et al., 2004). Prior NCES reports based on the SASS:04 dataset used a seven-category variable for race/ethnicity, similar to race/ethnicity-1 variable displayed in Table 9 (Strizek, Pittsonberger, Rioran, Lyter, & Orlofsky, 2006). However, the analytic sample included only a small number of teachers in most categories other than white, non-Hispanic. Therefore, the second category (race/ethnicity-2) was used for all other analyses in this study.

INSERT TABLE 9 ABOUT HERE

Research Question One

What are the characteristics of the special education teachers in the SASS:04 sample in terms of measures of teacher qualifications (amount of teacher preparation, degree major in special education or other education, degree level, certification in special education, certification in education, type of preparation program, and teaching experience)? Do the qualifications vary among teachers according to: (a) demographic characteristics (gender, age, and race/ethnicity), or (b) teaching position (teaching assignment and school level)?

Initially, the teacher qualifications of special education teachers in the analytic sample were described (N= 5,263). The findings (reported in Table 10) identified that the majority of special educators had extensive teacher preparation (83.3%), a degree in special education (73.9%), completed a traditional teacher preparation program (75.9%), full certification in special education (84.1%), and three or more years of teaching experience (83.2%). Furthermore, only a small proportion of the special educators represented had only some or no teacher preparation (16.7%) or were not certified in any subject area (5.9%).

INSERT TABLE 10 ABOUT HERE

Next, differences in teacher qualifications among the subgroups were investigated by constructing two-way contingency tables. This allowed the relationship between the teacher qualification measures and demographic characteristics (gender, race/ethnicity, age), and teaching positions (school level and teaching position) to be explored. Since chi-square statistics are not based on variance measures, effect size statistics could not be used (R. Croninger, personal communications, July 30, 2008). Instead I used the Cramer's V statistic to measure the association between the variables. Cramer's V can be interpreted as: 0.5 or above is considered to be a strong association, 0.1 to 0.3 is considered a moderate association, and 0 to 0.1 is considered a weak or negligible association (Green & Salkind, 2005). Tables H1-H6 reporting the findings from the analysis of research question one can be found in Appendix H; the results are reported here.

Research question one involved testing multiple hypotheses, inflating the possibility of a Type I error, or the probability of rejecting a null hypothesis when it is true. To counteract the effect, a more conservative significance level was used in these analyses. Sidak (1967) suggests controlling for Type I error by adjusting the significance level according to the number of tests being performed. Therefore, the significance level was set at .007.

Demographic Characteristics

Gender. Table H1 (see Appendix H) presents the contingency table findings by gender. According to the chi-square analysis, a statistically significant relationship exists between gender and four of the teacher qualification measures (amount of teacher

preparation, degree major, certification in special education, and preparation program). .

Females in the analytic sample were more likely to have extensive teacher preparation

($\chi^2 = 24.10$, *df*= 2, *p*=<.01), a degree and full certification in special education ($\chi^2 =$

134.95, *df*= 2, *p*=<.01), and to have completed a traditional/degree-focused preparation

program ($\chi^2 = 14.85$, *df*= 2, *p*=<.01). In contrast, males from the analytic sample were

more likely to complete non-traditional/alternative programs and not have any formal

preparation in general or special education. Specifically, 30% of male special education

teachers did not hold a degree in either special or general education (compared to only

14.5% of female special educators) and twice as many male special educators did not

hold a certificate in special education than female special educators (26.7% and 13.9%

respectively). However, the Cramer's V statistic indicated that the strength of the

association between the significant variables was fairly weak, and therefore should be

interpreted with caution (ranging from .05 to .16).

Age. The relationship between the age of the special educator and the teacher

qualification measures was summarized in Table H2 (see Appendix H). Based on the chi-

square statistics, age was statistically significantly related to all of the teacher

qualification measures. Overall, special educators in the 41-50 age group appeared to be

most qualified. In terms of degree major, 80% of teachers in this age group had a degree

in special education compared to only 68-70% of teachers 40 years or younger and 73.5%

of teachers over age 51. Similarly, only 12% of teachers aged 41-50 had some or no

teacher preparation compared to 18-20% of teachers 40 years or younger and about 18%

of teachers over age 51. The youngest group of teachers, those under age 30, appeared

least likely to be certified in special education (80%) or in any subject area (89.1%) and

to enter the classroom without any preparation (8.8%). Interestingly, special educators over age 51 had the highest proportion of individuals with a general education degree rather than a special education degree or no degree in education. In terms of the strength of the relationship, there was a medium to strong relationship between the variables for age and teaching experience (Cramer's V= .45). A slight to moderate effect for age on teacher qualifications was also found for amount of preparation (Cramer's V=.10), degree in special education (Cramer's V= .10), certification in special education (Cramer's V= .12), and certification in any subject area (Cramer's V= .12).

Race/ethnicity. Table H3 (in Appendix H) presents the contingency table findings between race/ethnicity (white or minority) and the teacher qualification measures. Again, chi-square statistics were used to investigate the relationship between variables, finding a statistically significant relationship between race/ethnicity and all of the measures of teacher qualifications. However, interpretation of Cramer's V again finds the strength of the association to be weak to moderate, and therefore should be interpreted with caution (ranging from .07 to .17).

The findings suggest that white, non-Hispanic special education teachers were more qualified than special educators from minority groups. Nearly 30% of minority special educators had some or no teacher preparation prior to entering the classroom compared to approximately 14% of white special educators. In terms of degree and type of preparation program, twice the minority special educators had no degree in general or special education than white special educators (31.1% versus 14.3%) and did not complete any type of preparation program (11.9% versus 5.1%). Lastly, a larger

proportion of white special educators had more than three years of teaching experience (85.1%) compared to minority teachers (73.5%).

Summary. Inspection of the teacher qualification measures for special educators by demographic characteristics identified statistically significant differences according to gender, age, and race/ethnicity. A much larger proportion of the male special educators did not have a degree or certification in special education compared to female special educators. Teachers in the 41-50 year old age range appeared to be most qualified as a much larger portion had a degree and certification in special education and entered the classroom with extensive preparation. In terms of race/ethnicity, special educators from minority groups appeared to be much less qualified compared to white special educators. In comparison with white special educators, minority special educators more often did not have a degree in general or special education, did not complete any teacher preparation prior to entering the classroom, and were more often taught for three years or less.

Teaching Position

Teaching Assignment. The relationship between a teacher's assignment (regular full or part-time teacher, itinerant teacher, or long-term substitute) and the teacher qualification measures are displayed in Table H4 (see Appendix H). A statistically significant relationship exists between all of the teaching assignments with the measures of teacher qualifications. Overall, long-term substitute teachers were least likely to have extensive teacher preparation, and a larger proportion reported having no preparation prior to entering into teaching, no degree in education, and no certification in special education. A larger proportion of itinerant special education teachers completed extensive

teacher preparation programs prior to entering teaching (89.0% versus 83.1%), held a master's degree or higher (71.8% versus 53.2%), and had more than three years of experience than regular full or part-time special educators (90.9% versus 83.3%). However, regular special education teachers were more likely to have a degree (75.2% versus 62.6%) and certification in special education (85.6% versus 73.5%) than itinerant teachers. While long-term substitutes appeared to be least qualified overall, there were a large proportion of long-term substitute teachers who did have a degree in special education (39.8%), with many of them coming from traditional/degree-focused preparation programs (65.5%). Although theoretically the sampling weights allowed the proportions to be considered representative of the entire field of special educators employed in public schools, these findings should be interpreted with caution due to the small sample size of long-term substitute teachers (n= 83) and itinerant special educators (n= 309) in the analytic sample.

   School level. The final subgroup analysis investigated the relationship between measures of teacher qualifications with school level (primary, middle, high, and combined; Table H5 in Appendix H). Unlike the previous analyses only two of the measures had statistical significance: degree major (χ^2= 25.86, *df*= 6, *p*=<.01) and type of preparation program (χ^2= 19.14, *df*= 6, *p*=<.01). The proportion of special educators in the analytic sample from combined schools more often held special education degrees (78.6% compared to 72-76%) and slightly more completed traditional preparation programs (78.4% compared to 75-77%) than their peers in other types of schools, while a higher proportion of teachers in high schools had at least three years of teaching experience.

Summary. Although a large proportion of long-term substitute special educators had a degree in special education and completed traditional/degree-focused preparation, this group did appear to be least qualified compared with regular full and part-time special educators and itinerant special educators. Itinerant special educators more often completed extensive teacher preparation programs, a graduate degree, and had more than three years of experience compared to regular full or part-time special educators. However, regular full or part-time special educators more often had a degree and certification in special education compared to itinerant special educators.

Follow-up Analysis

One additional type of follow-up test of significance was conducted. Goodman and Kruskal's *tau* (τ) provided an opportunity to examine errors in prediction. It provides a value between zero and one indicating the extent to which one variable predicts another, comparing whether the predictions match the marginal totals (Norusis, 2008). In the analysis of research question one, a statistically significant *tau* indicated a difference in the proportions within a category compared to the marginal total (the complete analytic sample). A *tau* value of one would represent a perfect prediction of one variable on another, while a value of zero would indicate that the variable does not help to predict another variable at all. Table H6 in Appendix H presents the *tau* values for the teacher qualification measures with respect to gender, age, race/ethnicity, teaching assignment, and school level. Eight of the predictions were non-significant (gender on certification in any area, gender on teaching experience, age on completion of a graduate degree, school level on amount of preparation, school level on completion of an advanced degree, school level on certification in any subject, school level on certification in special education, and

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school level on type of preparation program). For the other variables, the proportions

found within the subgroups vary significantly in comparison with the full analytic

sample. However, the values of *tau* indicate that the subgroup variables add only a small

amount of accuracy in predicting the proportions.

<div align="center">Research Question Two</div>

How do the qualifications of special educators in high poverty schools compare to

the qualifications of special educators in low poverty schools? How do qualifications

vary across different urban areas (large or mid-size central city, urban fringe of large or

mid-size central city, small town/rural)?

Analysis of research question two was similar to research question one:

contingency tables, including frequencies and column percentages were constructed, and

chi-square statistics were analyzed. Cramer's V statistics and the Goodman-Kruskal *tau*

statistics were also evaluated to measure the strength of the association between

variables. The more conservative significance level (.007) was used for these tests to

counteract the effects of multiple hypotheses tests and the inflated possibility of rejecting

the null hypothesis when it is true. Many of the reported statistical tables are included in

in Appendix I.

Poverty Quartiles

Table I1 (see Appendix I) presents the teacher qualification measures by school

poverty quartiles. Other than degree levels, all of the measures were statistically

significant. The reported proportions demonstrate that teachers in low poverty schools

consistently have a higher proportion of teachers meeting the qualification measures

compared to other schools. In terms of the strength of the association, the school poverty

quartile has a moderate effect size in relation to the amount of preparation (Cramer's V= .14), the other effect sizes signified even weaker relationships, though all were statistically significant.

To analyze the qualifications of special educators by poverty quartiles, I focused narrowly on the differences between the high and low poverty quartiles. Figure 3 exemplifies the pattern found in the qualifications of special education teachers by poverty quartiles. Most special educators in the analytic sample had extensive teacher preparation prior to entering into teaching, although approximately 14% more of the special educators in the low poverty schools had extensive preparation than those in high poverty schools. Furthermore, about a quarter of the special educators from high poverty schools had either some preparation or no preparation in comparison with 10-15% of special education teachers from other schools. In the low poverty quartile, approximately 83% of special educators completed a traditional/degree-focused preparation program; in comparison, about 70% of special educators completed a traditional/degree-focused program with many more completing non-traditional/alternative programs than special educators in low poverty schools (23.7% versus 13.3%). In terms of certification, a larger proportion of special educators in low poverty schools had full certification in special education (86.3%) than in high poverty schools (79.2%).

<div align="center">INSERT FIGURE 3 ABOUT HERE</div>

Next, I examined whether the differences identified in teacher qualifications between the sampled teachers from high and low poverty schools were statistically significant by isolating just these two groups. Results from the chi-square analyses presented in Table 11 show statistically significant differences among all of the

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qualification measures except degree level. In terms of the strength association, isolating

the two groups produces slightly stronger Cramer's V values, suggesting a better

probability of predicting the qualification variables based on group membership when

isolating these two categories. The *tau* scores were also statistically significant, but the

values indicate only a very small effect. Figure 4 shows the differences in percentages of

the qualifications of special educators in high poverty schools versus low poverty

schools, further demonstrating that a higher proportion of the special education teachers

in high poverty schools in the SASS:04 sample were less qualified according to the

measures used in this analysis.

<div align="center">INSERT TABLE 11 ABOUT HERE</div>

<div align="center">INSERT FIGURE 4 ABOUT HERE</div>

Urbanicity

The next analyses investigated the relationship of urbanicity on the teacher

qualification measures. Again, contingency tables were produced and chi-square analyses

conducted. Table I2 presents the findings in Appendix I. The results indicated a

statistically significant relationship between the urbanicity of the schools and all teacher

qualification measures except the type of preparation program, degree level, and years of

teaching experience. However, inspection of the proportions within the teacher

qualification measures revealed relatively little variation among urban, suburban, and

rural schools. This is reflected in the statistically significant, but very weak, Cramer's V

values (ranging from .05-.06). Figure 5 portrays the distribution of qualified special

educators among schools by urbanicity. The figure illustrates that there is some variation

in the qualifications of special education teachers by urbanicity, but it is not as dramatic

as the variation found in the comparison of the high poverty quartile versus the low poverty quartile.

Inspection of the statistically significant differences by urbanicity identifies that fewer special educators in urban schools meet the qualification standards than do special educators in suburban and rural schools. For instance, 84-85% of special educators in suburban and rural schools begin teaching with extensive teacher preparation and less than 4% begin with no preparation. In contrast, about 80% of urban special educators begin teaching with the same amount of preparation and 6% begin with no preparation. About 3% more special educators in suburban and rural schools than in urban schools held special education certification. In terms of degree major, a larger proportion of special educators in rural schools held a general education degree (11.7% compared to less than 9% in urban and suburban schools), but the largest proportion of special educators with no degree in education were in urban schools (20.3% compared toabout 16% in suburban and rural schools).

INSERT FIGURE 5 ABOUT HERE

Similar to the follow-up analyses conducted comparing the qualifications of teachers from quartile 1 to quartile 4, I next isolated schools from only two of the urbanicity categories at a time (suburban versus urban, suburban versus rural, and urban versus rural). The results are reported in Table 12. The first comparison, suburban schools versus urban schools identified statistically significant differences among the teachers in terms of the amount of teacher preparation, degree major, certification in special education, and certification in any subject area. However, the strength of the association is weak at best.

INSERT TABLE 12 ABOUT HERE

Next, the qualifications of special educators from suburban schools were compared to special educators in rural schools. This analysis found only two statistically significant relationships: degree major and degree level (Table 13). However, inspection of the effect size values found only a weak, albeit statistically significant, relationship.

INSERT TABLE 13 ABOUT HERE

Last, teachers in the sample from urban schools were compared to those teachers from rural schools (Table 14). Of the teacher qualification measures, only one had statistical significance: degree major. Again, inspection of the effect size values found weak, albeit statistically significant, relationships between the qualification measures and the urbanicity of the school.

INSERT TABLE 14 ABOUT HERE

Summary

Comparison of special education teacher qualifications by school poverty quartile revealed that a larger proportion of special educators in high poverty schools were less qualified than their peers in low poverty schools. For instance, a larger proportion entered the classroom with only some or no preparation and completed non-traditional/alternative preparation program. Comparison of the qualifications of special educators by the urbanicity of the school revealed that urban schools have the least qualified teachers. However, many of the differences were only by a few percentage points yielding only mildly significant relationships.

Table 15 summarizes the overall findings from research questions one and two, highlighting the strength of associations according to the Cramer's *V* statistic. All statistically significant associations are noted, but only the proportions for qualifications with a moderate strength of association are reported in the table. Almost all of the qualification measures yielded statistically significant differences in the subgroup analyses by demographic characteristics and teaching position; however, none had a strong association with the teacher qualification measures according to the Cramer's *V*

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statistics and only about half had a moderate association with the measures. In comparison, only the amount of preparation and school poverty level yielded a moderate association and none the teacher qualification measures yielded a moderate association with urbanicity.

INSERT TABLE 15 ABOUT HERE

Research Question Three

Do special education teachers in (a) high poverty schools, (b) urban schools, (c) rural schools, meet the same qualifications as special education teachers in other schools?

Research question three required the use of logistic regression analysis. In this study, three models were run with three different dichotomous dependent variables. In the first model, poverty level was the dependent variable, comparing high poverty schools to the other schools in the sample. The dependent variable in the second and third models was urbanicity; urban schools served as the reference group in the second model and rural schools were the reference group in the third model.

In logistic regression, multicollinearity among variables can lead to misleading results if the predictor variables are too highly correlated (Leech et al., 2008). Therefore, prior to conducting the analysis, intercorrelations among the predictor variables were inspected. First, correlations were computed for all of the predictor variables (teacher qualification measures, demographic variables, teaching assignment, and school level). Because the variables were not normally distributed the Spearman *rho*, rather than the Pearson correlation coefficient, was used to avoid violating the basic assumptions of the Pearson correlation (Leech et al.). Variables with correlations above .50 or .60 are considered highly correlated and therefore problematic (Leech et al.).

The correlations among the variables used in this study are presented in Table 16. The majority of correlations were statistically significant at the .05 level, as indicated by the asterisks. The sign (positive or negative) indicates the direction of the relationship; the correlation coefficients can be interpreted as: 0.5 or above indicates a strong relationship, 0.1 to 0.3 indicates a moderate relationship, and 0 to 0.1 indicates a weak or negligible relationship.

<div align="center">INSERT TABLE 16 ABOUT HERE</div>

Many of the correlations fell in the weak to moderate range; however, a strong relationship was found between certification in special education and certification in any subject area, indicating a potential problem with collinearity. Teaching assignment (regular full or part-time, itinerant, or long-term substitute) has a negative relationship with the variables for degree major, special education certification, certification in any subject area, program type, and race/ethnicity, although the relationships were weak. Other negative relationships include age with gender, school level (high, middle, elementary, or combined) with gender, and race with teaching assignment.

In addition, the tolerance statistics were evaluated as a test of multicollinearity. The tolerance statistic represents how much of the variance each variable explains; tolerance statistics less than .20 raise concerns, while less than a .10 is an indicator of a serious problem with collinearity (Menard, 1995). According to this benchmark, collinearity is not an issue since all values exceeded .61. Therefore, all predictor variables remained in the model at the start and were re-evaluated at each stage of the model building process.

Three separate analyses were conducted using logistic regression analysis. First, the likelihood of a special education teacher from the sample teaching in a high poverty school is examined. Next, the likelihood of a special education teacher from the sample teaching in an urban school is examined. Last, the likelihood of a special education teacher from the sample teaching in a rural school is examined.

High Poverty Schools

After first inspecting the model with all teacher qualification predictor variables and controlling for demographic characteristics, I determined that the model did little to predict whether a special educator taught in a high poverty school. Therefore, the model was simplified following guidelines established by Hosmer and Lemeshow (2000) and Norusis (2008). Hosmer and Lemeshow suggest maintaining variables in the model if they have an observed significance level less than .25 or have theoretical relevance. In addition, Norusis suggests keeping variables that may be relevant to the study for theoretical purposes and all dummy coded variables related to a single categorical variable.

Several interaction terms were also added to the model to evaluate whether they helped to more accurately predict the likelihood of teaching in a high poverty school. Due to the large number of predictor variables, I chose to inspect the interaction of being a novice teacher on several of the qualifications (possessing a degree in general or special education, holding a certificate in any area or in special education, and amount of preparation). Predictors which were significant in the interaction were maintained independently, even if their main effect was not statistically significant.

The simplified model significantly predicted whether or not a special education teacher teaches in a high poverty school (model three in Table 17; χ^2= 445.90, *df*= 15, *p*<.01). The results are reported using the odds ratios (OR); therefore the coefficients can exceed zero and one. Table 17 presents the odds ratios for each of the three models leading to the fully defined model. Table J1 in Appendix J presents other relevant statistics for this model (i.e., odds, Wald statistics, and confidence intervals).

INSERT TABLE 17 ABOUT HERE

In the first model, six of the variables were statistically significant predictors of a special educator teaching in a high poverty school. The non-significant results for novice teachers (those with three years of teaching experience or less) and degree major in the first model suggested that these variables may be interacting with other variables. Therefore, in models two and three interaction terms between the predictor variable for novice and variables for education major and certification in either special education or any education were added to the model.

The addition of the interaction terms in the second and third models caused a number of changes to the significance of several predictor variables. The variable for little or no preparation lost its significance in the models two and three and the variable for long-term substitute lost significance in model three. However, in model three no certificate (any) gained significance in model three. This may be explained by the large effect the interaction of no education major by novice plays in the model as the odds of a special educator with no degree in education and with less than three years of teaching experience were increasingly greater in high poverty schools (OR= 1.91). The interaction of no certification by novice being less than one indicated that in a high poverty school

the novice teachers were not more likely than the more experienced teachers to not be certified in any subject.

Throughout all three models the variable representing minority special educators remained the strongest predictor of the likelihood of teaching in a high poverty school (OR= 3.97). Other strong predictors of a special educator being in a high poverty school included not being certified in any subject (OR= 2.06) or in special education (OR= 1.42), having only some preparation prior to entering the classroom (OR= 1.38), and completing a non-traditional/alternative preparation program (OR= 1.29). The simplified model accurately predicted the likelihood of a special educator teaching in a high poverty school 45.8% of the time, teaching in other schools 80.4% of the time, and overall accurately predicted the place of employment 71.8% of the time.

Urban Schools

The full model with all teacher qualification and demographic variables entered did little to help predict whether a special education teacher worked in an urban school. Therefore, predictor variables in the model needed to be evaluated. The same guidelines for choosing which variables to enter or remove were followed for this logistic regression analysis. With all of the variables entered together the model significantly predicts the likelihood of a special educator working in an urban school (model four in Table 17; $\chi^2=$ 428.07, *df*= 18, *p*<.01). Table 18 presents the odds ratios for the four models created; Table J2 in Appendix J presents other relevant statistics for this model (odds, Wald statistics, and confidence intervals).

INSERT TABLE 18 ABOUT HERE

In the first model, seven of the predictor variables were statistically significant, three of which predicted that special educators with certain characteristics (completing and alternative preparation program, being an itinerant teacher, and being a novice teacher) were less likely to work in an urban school. This finding remained consistent in all four of the models. To more accurately predict the likelihood of teaching in an urban school, interaction terms were added to the model following the addition of the teacher qualification measures. In models two and three, the interaction of novice by no education major was statistically significant (model 2 OR= 1.73, model 3 OR= 1.88); however, the addition of other interaction terms caused it to lose significance. For instance, the interaction of no certification with novice strongly predicts the likelihood of a special educator teaching in an urban school (model 3 OR= 3.49, model 3 OR= 2.70) as do the interactions of little/no preparation with novice (model 4 OR= 6.32) and some preparation with novice (model 4 OR= 3.83). The statistical significance of these variables indicated that teachers with three years of less of teaching experience with no certification in any subject and some or no prior preparation were much more likely to work in urban schools. And while models three and four indicated that novice teachers in general and novice teachers without special education certification were less likely to choose to work in an urban school. This finding may be due the widespread use of teachers without special education certification in all schools to fill positions due to chronic shortages.

Similar to the model predicting the likelihood of teaching in a high poverty school, being from a minority group strongly predicted teaching in an urban school (OR= 3.85). As predictor variables were entered and the model simplified, the long-term

substitute variable gained additional strength as a predictor of a special educator teaching in an urban school (OR= 3.90). The model accurately predicted 40.3% of the special educators in urban schools, 82.3% of special educators in other schools, and overall the model accurately predicted the placement of 69.8% of the special educators in the sample.

Rural Schools

Similar to the models for urban and high poverty schools, the full model with all teacher qualification variables and controlling for teacher demographic characteristics did little to predict the possibility of a special educator teaching in a rural school. The same methodology for determining inclusion in the final model applied to this logistic regression analysis. The model with all predictors entered significantly predict whether a special education teacher works in an urban school (model two in Table 18; χ^2= 85.27, *df*= 11, *p*<.01). Table 19 presents the odds ratios; Table J3 in Appendix J presents other relevant statistics for the final model (i.e., odds, Wald statistics, and confidence intervals).

INSERT TABLE 19 ABOUT HERE

Unlike the simplified models predicting teaching in a high poverty or urban school, the simplified model for predicting teaching special education in a rural had only one significant interaction term in addition to two statistically significant main effects. Although the interaction of some preparation by novice was not statistically significant, it did meet the other criteria for inclusion in the model. The final model identified that rural special educators were less likely to work as long-term substitute teachers in comparison with other schools (OR= .09). However, the special educators in rural schools were more

likely to have a general education major than special educators in other schools (OR= 1.46).

Summary

The logistic regression analyses conducted for research question three found it possible to model the odds of a special educator teaching in a high poverty, urban, or rural school based on the teacher qualifications. Teachers in high poverty schools were more likely to be from a minority group, to have completed an alternative preparation program, and to have neither a special education certificate nor any teaching certificate. Furthermore, the novice teachers in high poverty schools were more likely to not have any education major compared to novice teachers in other schools, but were less likely to not hold a teaching certificate. Special educators teaching in urban schools were more likely than special educators in other types of schools to be a minority group member, have a long-term substitute teaching position and no special education certification. Moreover, the novice special educators in urban schools were more likely to have a general education degree, not have a teaching certificate, and some or little preparation in teaching methods compared to novice teachers in other schools. The special educators in rural schools were more likely than other special educators to have a general education degree, but less likely to be a minority group member, have a long-term substitute teaching position, and have only some preparation.

CHAPTER V

Discussion

The insufficient supply and uneven distribution of qualified special education teachers limits our ability to create an equitable educational system for students with disabilities. To investigate this problem, this study utilized data from the SASS:04 dataset to measure the qualifications of the supply of qualified special education teachers available to public schools. It provided a descriptive profile to analyze the differences in the qualifications of special educators according to demographic characteristics (gender, age, and race/ethnicity) and teaching position (teaching assignment and school level). In addition, this study contributed to our understanding of the differences in the qualifications of special educators among high poverty schools and in different urban areas. Seven qualification measures were examined, including: (a) amount of teacher preparation, (b) degree major in special or general education, (c) degree level, (d) certification in special education, (e) certification in any subject area, (f) type of preparation program, and (g) years of teaching experiences. The findings provide an opportunity to evaluate the distribution of special education teachers in terms of the equal opportunity equity principle established by Berne and Stiefel (1984, 1994).

This chapter discusses the findings, implications, and recommendations for future research. It is divided into three sections: (a) a discussion of the descriptive profile of special educators, (b) a review of how the findings in relation to the equal opportunity standard, and (c) a discussion of the findings for policy and research.

Descriptive Profile of Special Education Teachers

The qualifications of special educators were investigated according to demographic characteristics (age, race/ethnicity, and gender) and teaching position

(teaching assignment and school level), providing a descriptive profile of the supply of special educators in the SASS:04 sample; Table 20 summarizes the major findings.

INSERT TABLE 20 ABOUT HERE

The qualifications analyzed in this study replicated and extended findings from previous research studies. Similar to findings from Billingsley (2002) and Boe (2006), the majority of special educators in the sample were white women with certification and preparation in special education. However, unlike Carlson et al. (2002), who identified the majority of special educators were in their 20s, this study found that the majority of special educators were over 40. Extending the findings from previous research, this study compared the the qualifications of special educators by gender, age, and race/ethnicity. Male special education teachers were less likely to be certified in special education and more likely to enter the classroom from a non-traditional, alternative preparation program with only some prior coursework and field experiences. Younger special education teachers were often less qualified and a larger proportion were prepared by non-degree, alternative preparation programs rather than traditional, degree-focused programs. The most significant discrepancies in qualifications appeared in the comparisons between white special educators and minority special education teachers. A much smaller proportion of minority teachers entered the classroom with extensive preparation (71.1% compared to 85.7%), without a degree in general or special education (14.3% compared to 31.1%), and without special education certification (14.7% compared to 21.8%). As a field struggling to diversify and expand the supply, the findings that the younger, male, and minority special educators currently in the field have lesser qualifications is problematic. Furthermore, the findings may have major implications for the field of

special education in light of the overrepresentation of males and minority youth identified with a disability.

The results indicated that a large proportion of individuals entered the classroom without certification and formal preparation, qualifications research has indicated are important to the retention of special educators in the field (Boe, Bobbitt, & Cook, 1997; Boe, Bobbitt, Cook, Whitener et al., 1997). Of the sample of special educators in the SASS:04, 16.7% entered special education classrooms with limited or no teacher preparation coursework or field-based practicum experiences. While many of these individuals may complete alternative preparation programs during their tenure in the classroom, the inconsistent standards among alternative preparation programs makes this finding troublesome at best (Rosenberg et al., 2007; Rosenberg & Sindelar, 2005). In addition, a quarter of the special education teachers in the sample did not have formal preparation in special education; while 9% of these teachers had at least a general education degree, the other 16% did not have any formal preparation in education. This finding supports those who have reported that the field of special education annually relies on a large number of individuals with training in other fields who enter special education classrooms until a vacancy opens in a general education classroom and the dependence in special education on individuals without any preparation at all (Boe, Bobbitt, & Cook; Boe, Bobbitt, Cook, Whitener et al.). Either possibility increases the likelihood of higher rates of attrition as teachers without training and certification more often choose to leave the special education classroom (Billingsley, 2004b, Boe et al., 1998).

The over-reliance on long-term substitute teachers in special education has been alluded to in the literature (Recruiting New Teachers, Inc., 2000; Southeast Center for Teaching Quality, 2004). The descriptive profile included an investigation of their qualifications, finding that many of these teachers do have extensive teacher preparation (74.7%), certification in some subject area (61.4%), and completed a traditional preparation program (65.5%). Further, while a considerable number earned a degree in special education (39.8%), nearly half do not have a degree in general or special education (48.2%). In addition, only about 40% have a special education teaching certificate. Although this study does not provide an opportunity to investigate the role of long-term substitutes in providing services to students in special education it does provide support for such an investigation.

The profile of special educators across school levels found statistically significant differences between elementary, middle, high, and combined schools with regards to degree majors and the type of preparation programs. Overall, the special educators in the sample working in combined schools, which may serve a combination of elementary, middle, and high school students, were more qualified than other special education teachers in terms of having a degree in special education (78.6%) from a traditional preparation program (78.4%). A plausible explanation for this finding is that the combined schools may represent special centers for students with various types of disabilities which may try to limit their staff members to only special educators with the appropriate training to meet the unique needs of their students.

Looking across other school levels, primary schools and middle schools have a slightly higher proportion of special education teachers completing non-traditional or

alternative programs (18.2% and 19.5%, respectively compared to 17.4% in high schools and 12.7% in combined schools). This pattern continues with regards to special educators entering the classroom with no formal preparation at all (6.8% and 5.4%, respectively compared to 5.0% in high schools); however combined schools have the highest proportion of teachers not completing any preparation program (9%), which may indicate difficulties recruiting and retaining qualified staff members in these schools. The over-reliance on individuals from alternative preparation programs and with no formal preparation is problematic. Although alternative preparation programs provide a path for teachers to meet the HQSET standards, they were developed primarily to allow individuals with extensive preparation in math and science to quickly enter into classrooms (Rosenberg et al., 2007; Rosenberg & Sindelar, 2005). It is unclear whether such programs can adequately prepare special educators to meet the demands of their position (Rosenberg et al.).

Unlike other studies characterizing the supply of special educators, such as those conducted by Boe and his colleagues (Boe, Bobbitt, & Cook; Boe, Bobbitt, Cook, Whitener et al.), systematic differences in the qualifications among teachers were explored in this study. While the majority of special education teachers in the sample met the qualifications examined, there were statistically significant differences among many of the subgroups examined. The next section reviews the findings in terms of differences in teacher qualifications by school characteristics (poverty quartile and urbanicity).

Findings in Relation to the Standard of Equal Opportunity

Research questions two and three evaluated the distribution of qualified special educators across poverty quartiles and different urban areas. A disproportionate number

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of under-qualified special education teachers in high poverty schools or in different urban areas may signal that public education is not meeting the equal opportunity standard. According to Berne and Stiefel (1984, 1994), this standard can be used to judge the equity of a system based on the relationship between a resource and its distribution among schools. If it can be determined that the resource is unequally distributed among schools based on a certain demographic characteristic, the equal opportunity standard is not met and the distribution can be judged inequitable. I combine results from the second and third research questions in order to discuss the findings first in terms of poverty quartiles and then by urban area.

High Poverty Schools

Research from general education recognizes the difficulties hard-to-staff schools face recruiting and retaining qualified educators, especially in special education (Clotfelter et al., 2006; National Partnership for Teaching in At-Risk Schools, 2005). This study sought to extend these findings by focusing on individual special education teachers at the school level, rather than using aggregated qualification measures for an entire faculty. Statistically significant differences in the qualifications of special educators were identified by comparing the highest poverty quartile to the lowest. The differences were most pronounced for type of preparation program, where 83% of special education teachers in low poverty schools completed a traditional or degree-focused program compared to only 68.7% in high poverty schools. Instead, a much higher proportion of the teachers in the sample from high poverty schools completed an alternative or non-traditional preparation program (23.7% versus 13.3%).

The analysis used in research question two replicated the methodology used in Clotfelter et al.'s (2007a) investigation of the distribution of qualified teachers in North Carolina using different qualification measures. However, one measure from the Clotfelter et al. study is similar to the qualifications used in the present study: years of teaching experience, though different cut-points are used in the Clotfelter et al. study compared to the present study. Clotfelter et al. found that the proportion of teachers with less than three years of teaching experience ranged from 17-24% in high poverty schools and 13-14% in low poverty schools. In comparison, about 16% of special educators in the SASS:04 sample teachers in low poverty schools had three years of experience or less, while 20% of special educators included from high poverty schools have three years or less. In light of the different cut-points, the results seem comparable, suggesting that special education and general education teachers with multiple years of experience prefer to teach in low poverty schools rather than high poverty schools. Ascher & Fruchter (2001) reported similar findings in their study on the distribution of teachers among schools in New York City.

Results of my study were similar to other studies on the uneven distribution of teachers (Ascher & Fruchter, 2001; Clotfelter et al., 2005, 2006). Special educators in high poverty schools were more likely to complete a non-traditional or alternative preparation program, to enter teaching with only some preparation, and to hold a teaching certificate. Furthermore, teachers with three years of teaching experience or less in high poverty schools were more likely than their peers in other schools to not have an education major or a teaching certificate. The statistically significant findings from research questions two and three suggest differences in the qualifications of special

educators by poverty quartile and urbanicity. The strongest predictor of which special educators would be working in a high poverty schools was membership in a minority group. This is disconcerting in light of the results from research question one that identified minority teachers to be much less qualified than their white, non-Hispanic peers. Thus, the findings indicate an inequitable distribution of special education teachers based on the equal opportunity principle. That is, less qualified special educators are more likely to be employed in high poverty schools. This finding is problematic as research demonstrates that the academic success of students in high poverty schools is correlated with the qualifications of the teachers in their schools and that these students may be more dependent on the quality of their teachers than students from more affluent schools (Ascher & Fruchter, 2001; Corcoran, 2007; Iatorola & Stiefel, 2003).

Urban Area of Schools

Extending the findings of Lankford, Loeb, and Wyckoff (2002), who identified significant differences in the qualifications of teachers by urban areas in New York, this study investigated differences in the qualifications of special education teachers among different urban areas. It compared schools according to three urbanicities (urban, suburban, and rural), identifying statistically significant differences in the amount of teacher preparation, degree major, and certification in special education or any other subject.

Special education teachers from urban schools in the SASS:04 sample were significantly different than the special education teachers in suburban schools in the amount of preparation, degree major, and certification in special education or any other subject area. Although urban schools were just as likely to employ new special educators

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as other schools, the new special education teachers employed in urban schools were six times more likely to have only some preparation and nearly four times more likely to have no preparation at all. Furthermore, the special educators in urban schools were nearly four times more likely to be employed as long-term substitute teachers, and therefore not subject to meet the HQSET standards.

Unlike urban special education teachers, rural special educators differed from other special educators in only the degree major and degree level, as fewer rural special educators had a degree in special education or a graduate degree. Monk (2007) urged researchers and policymakers to focus research efforts on this often overlooked group of teachers. Consistent with his findings, the special educators in rural schools were less likely to have a graduate degree.

The logistic regression analyses identified very different models for urban and rural schools. The rural schools model found that the special education teachers in these schools were decreasingly less likely to be a minority or a long-term substitute teacher. Also, the novice teachers in rural schools were less likely to only have some preparation than novice teachers in other schools. However, novice special educators in rural schools were more likely to have a general education degree rather than a degree in special education or not in education at all. A possible explanation is these individuals accept a position to get "their foot in the door," only to transfer to a position in their subject area of training when a position opens. Limitations in the SASS:04 prohibit this study from further analysis of the finding; however, it seems plausible based on other studies that point out the large number of special educators migrate to general education classrooms annually (Boe, Bobbitt, & Cook, 1997; Boe, Bobbitt, Cook, Whitener et al., 1997).

Results from the logistic regression analyses modeling the qualifications of special education teachers in urban schools were much more poignant. Special education teachers in urban schools were much more likely to be long-term substitute teachers compared to special educators in other schools. They were also six times more likely to be from a minority group. While urban schools were less likely to have a novice special education teacher compared with other schools, the novice teachers they employed were more likely to have a general education major, no certification, or to not have extensive teacher preparation. Furthermore, the novice teachers from urban schools were much more likely to begin teaching with little or no teacher preparation coursework or field experiences compared to other novice special education teachers.

In terms of Berne and Stiefel's (1984, 1994) equity framework, the equal opportunity standard was not met among different urban areas as a relationship existed between the qualifications of special education teachers and teaching in urban schools. Perhaps most alarming was the significant likelihood to use long-term substitute teachers to fill special education teaching positions in urban schools. However, this finding should be interpreted with caution due to the limited number of long-term substitutes included in the overall sample. Also disconcerting was the disproportionate number of novice special education teachers with little or no preparation entering into urban schools. The over-reliance on novice, unprepared, unqualified special education teachers clearly has implications for the academic success of students with disabilities in urban schools.

Implications for Policy and Research

The findings presented here have a number of implications for policy and research. The finding that there is a shortage of qualified special educators in public

schools is not novel; however, the clear relationship between the poverty quartile and urbanicity of the school has major repercussions for meeting the goals outlined by both NCLB and IDEA 2004. The reliance on individuals with some or no preparation in special education has major repercussions for the field, as more alternative route to certification (ARC) programs are developed to meet the increased demands for special educators to meet HQSET standards. At the same time, concerted efforts need to be undertaken to adequately prepare male special educators and special educators from minority groups as these individuals often enter without formal preparation in education. The adequate preparation of special educators from minority groups is especially relevant due to the significant likelihood they will teach in high poverty and urban schools in light of research on the significant role a teacher plays in boosting student academic performance in these schools (Corcoran, 2007). Furthermore, the apparent dependence on long-term substitute teachers to fill positions in special education in urban schools raises questions about their ability to provide appropriate, high-quality services to students with disabilities. The implications for policy are addressed in the next sections.

Alternative Routes to Certification

The large number of special educators who enter the classroom without extensive teacher preparation or a degree in special education indicates a need for policymakers to more thoroughly address standards for ARC programs. Both NCLB and IDEA 2004 offer ARC programs as a legitimate path to meeting the HQT and HQSET standards, but do not define the standards and expectations of such programs. Rosenberg and Sindelar (2005) and Rosenberg et al. (2007) in their analyses of ARC programs nationwide identify significant variations among programs in terms of preparation prior to entering

the classroom, supervision and mentorship during teaching, and the length of the program. Furthermore, there is some evidence that ARC program participants are not as adept as their peers from traditional preparation programs (Nougaret, Scruggs, & Mastropieri, 2005; deBettencourt & Howard, 2004; Sindelar, Daunic, & Rennells, 2004). The lack of consistent standards and expectations does little to help develop a qualified, competent field of special educators.

Unlike ARC programs, most states require traditional preparation programs to undergo accreditation by an external agency, such as the National Council for Accreditation of Teacher Education (NCATE). To ensure ARC programs meet similar standards in the preparation of new teachers, similar standards and an accreditation process should be developed. At the same time, further research needs to be conducted to identify which components of both traditional and ARC preparation programs matter to the increased academic achievement of youth with disabilities. These issues should be addressed in the federal reauthorization of NCLB and IDEA 2004, as well as in state higher education policies.

Recruiting Male and Minority Special Educators

Nearly 85% of the sampled special educators were white women, a finding consistent with other studies (Boe, 2006; Carlson et al., 2002). This is at odds with the overrepresentation of male and minority youth with disabilities. Furthermore, the male and minority special educators in the sample were lesser qualified according to many of the qualifications, including formal preparation and certification in special education in comparison with the female and white, non-Hispanic special educators. Although personnel preparation training grants supported by OSEP funding prioritize the

recruitment and training of individuals from minority groups a significant portion still enter classrooms with limited preparation or training in special education.

At the same time, the findings suggest that a large portion of the male and minority special educators enter the field through one of two routes: either through non-traditional/alternative programs or without any formal preparation in education at all. Those entering from non-traditional/alternative routes should receive training in programs meeting high standards with proven effectiveness. Nearly a third of male and minority special educators in the sample had no formal preparation in education. Although the research is contested on the value of preparation and coursework in the training of educators, the research on attrition from special education finds that teachers without formal preparation are more likely to leave the field (Boe, Bobbitt, & Cook, 1997; Boe, Bobbitt, Cook, Whitener et al., 1997). Without adequate training and support the male and minority teachers the field needs may leave as quickly as they entered.

The large proportion of male and minority special educators who enter the field without a background in education provide additional research opportunities. In-depth, qualitative studies regarding their choice to enter the field is crucial, but so is an understanding of what deterred them from pursuing a career in special education earlier may provide interesting feedback for preservice preparation programs and assist with future recruitment efforts.

Long-term Substitute Teachers

The logistic regression analysis revealed that urban schools were nearly four times more likely than other schools to employ long-term substitute teachers in special education. This finding has major repercussions in the field of special education. Long-

term substitute teachers do not need to meet the HQSET standards, though they may be responsible for the provision of educational services to students with disabilities. Unfortunately, the SASS:04 database does not provide a way to inspect the role of long-term substitute teachers or the length of their employment as a special educator. The significant findings provide support for future research on the use of long-term substitutes as little is known in both general and special education.

Limitations of the Study

There are a number of limitations to this study. The purpose of the study was to investigate the qualifications of special educators and the distribution of qualified special educators using a large scale dataset. However, the qualification measures used in this study were limited by the information available in the SASS:04 Teacher Questionnaire. Although the measures replicated those used in other studies on the supply of special educators and the distribution of teachers, there is only limited evidence on their relationship to improved outcomes for students with disabilities. In both general and special education, the definition of quality, the best methods to prepare future teachers, and the need for certification remain highly contested. Research studies employing datasets with clearly defined outcome measures for students and data on special education teachers, such as those being prepared by states to meet monitoring requirements outlined by state accountability standards, are necessary to begin to understand the relationship between the qualifications of special education teachers and success of students with disabilities. Universities and colleges should participate in the development of such databases to begin to untangle the relationship between coursework and field experiences with successful teaching in special education.

The complex survey design of the SASS:04 dataset utilizes multiple probability estimates, calculating weights to enable researchers to generalize the findings to the full population of teachers. However, the limited number of special education teachers in the role of long-term substitute (n= 83) who participated in the survey is also a cause for concern. The findings signal a real need for additional research on the qualifications of these individuals, the roles they play, and the support they are provided.

Although the SASS:04 dataset provides nationally representative information about schools and schooling in the U.S. at the time of data collection, it does not provide researchers or policymakers with the ability to track changes occurring within the schools and school districts over time. Additionally, the SASS:04 dataset was collected prior to the enactment of the NCLB and IDEA 2004. This poses two significant limitations. First, the Teacher Questionnaire does not address whether teachers met the HQT or HQSET provisions. Furthermore, the SASS:04 cannot be used to follow educators longitudinally, therefore there is no way to determine whether the teachers from the sample investigated became highly qualified.

Another limitation relates to the different roles a special educator may play within a school, making it difficult to understand the nature of their role and the specific certifications or qualifications that may be necessary for those roles. Rather than teaching a single subject or grade level, a special educators' role may include case managing, co-teaching, instructing self-contained classrooms, tutoring in resource rooms, and providing consultative services. Furthermore, special educators may work with students with a wide range of disabilities, from learning disabilities and behavior disorders to mental retardation and autism. Although many states are moving to more generic forms of

certification for special educators, some states still use categorical certification, limiting teachers to certification in more narrow categories. The SASS:04 Teacher Questionnaire does not provide specific information about the various roles special educators play or the types of students to whom a special educator may be providing instruction. This limited the ability of this study to analyze how special education teachers with certain areas of expertise or in various roles may be more in demand than others due to shortages in the field and changes in the population of students with disabilities.

Future iterations of the SASS questionnaires should include pertinent questions related to dilemmas faced by the field of special education. In addition to asking subjects being taught, information about the inclusion of students with disabilities and the availability of special education co-teachers and/or paraprofessionals should be gathered. Certification questions should address whether a teacher meets the HQT or HQSET requirements for each subject taught. This information would allow a more in-depth exploration of the field.

Future Research

Much has been written on the "chronic shortage" of special education teachers and the difficulties faced by schools in recruiting and retaining individuals in the field (Billingsley, 1993, 2004a, 2004b; Boe, 2006; Boe & Cook, 2006). The shortage and high rates of turnover pose significant challenges to district and school administrators and hinder our abilities to create an equitable educational system for students with disabilities. However, the lack of research on which qualifications, type of preparation, and means to certification lead to increased student academic achievement leaves the field to rely on findings from general education. However, there may be noteworthy

differences in what is necessary to be a qualified special educator, due to the very different demands placed on special education teachers in terms of individualization of coursework for students, collaboration with other teachers and paraprofessionals, and necessary paperwork. Research on which qualifications are necessary to increase outcomes for students with disabilities should be a priority for the field.

The SASS:04 dataset provided an opportunity to explore how qualifications vary across different subgroups, by poverty quartile, and by urbanicity. However, the data were collected prior to the reauthorization of IDEA which instituted major changes in certification requirements for special educators, as now individuals providing instruction in a core academic subject must hold certification in both the subject and special education. The release of the SASS data collected during the 2007-2008 school year will provide an opportunity to evaluate changes in the field regarding certification. However, the Teacher Questionnaire still collects only limited data on the extent to which a special educator provides instruction in academics. Other datasets which focus on the field of special education (such as SPeNSE or the Special Education Elementary Longitudinal Study [SEELS]) also offer only limited information on the role a special educator plays in providing instruction. Additional studies are necessary to better understand the extent to which special educators are teaching subjects in which they have training and certification.

A last area of need relates to the uneven distribution of special education teachers in high poverty and urban schools. The investigation from both perspectives revealed significant differences in the qualifications of special educators across school types; however, the findings were not identical. While this may be related to the classification

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system employed, it also may signal that there are unique differences in urban schools and that there may be many high poverty schools that are not located in urban areas that are experiencing difficulties attracting qualified special educators. Future research should focus on differences within districts using the large datasets becoming available due to the reporting requirements of both NCLB and IDEA 2004.

Summary

This study provided a descriptive profile of the special education teachers in the 2003-04 administration of the SASS (SASS:04). In addition it examined how the qualifications of special education teachers in the SASS:04 sample varied among K-12 public schools according to the urbanicity or school poverty quartile. The results of the study showed statistically significant variations in the qualifications of special educators by age range, gender, race/ethnicity, school level, and teaching assignment. The extent of the variation depended largely on the subgroup being analyzed. The analysis by school poverty quartile and urbanicity revealed a relationship between the school characteristic (such as high poverty or urban) with the qualifications of special education teachers working in these schools. These findings indicate that as a field we are not meeting the equal opportunity standard of equity.

This study contributed to our understanding of the supply and distribution of special education teachers by utilizing the SASS:04 dataset. This is valuable as the SASS:04 dataset captured the state of the special education workforce as state education agencies and teacher preparation programs began to make the necessary changes to meet standards set in place in the HQSET provisions. This study identified statistically significant differences in the qualifications of special educators by their subgroup

classification; most notably, major differences were noted in the qualifications of minority group members, younger teachers, and long-term substitute teachers. Future research should focus on these teachers to determine if the trend continues. Finally, this study examined the distribution of qualified special education teachers among schools poverty quartiles and urban areas, finding significant differences in many of the qualification measures. This finding provides evidence that special education teachers were not equitably distributed across schools. Policymakers should address this through policies related to the preparation of special educators, especially those trained through non-traditional or alternative preparation programs.

TABLES

Table 1

Studies in Special Education using the Schools and Staffing Survey (SASS) and the

Teacher Follow-up Survey (TFS)

Study	SASS/TFS Year(s)	Other Sources of Data
Boe, Bobbitt, & Cook (1997)	1987-88 SASS; 1989 TFS	Not applicable (NA)
Boe, Bobbitt, Cook, Whitener et al. (1997)	1987-88 SASS; 1989 TFS	NA
Boe et al. (1998)	1990-91 SASS	State Special Education Personnel Data Collection and Reporting System (SSEPDCRS)
Boe & Cook (2006)	1999-2000 SASS	1987-88, 1990-91, 1993-94, & 1999-2000 SASS for trend data analysis; 1987-88 through 2001-02 DANS
Boe et al. (2007)	1999-2000 SASS	NA

Table 2

Qualification Measures from Investigations on the Distribution of Teachers Used in Previous Studies

Citation	Sample	Teacher Qualifications	Teacher Characteristics	Student/School Characteristics
Lankford, Loeb, & Wyckoff (2002)	New York State public schools	- percent (%) of teachers with no prior teaching experience - % with no more than a BA - % not certified in any current assignment - % certified in all current assignments - % who failed a state teachers' exam - % who attended most competitive and highly competitive undergraduate schools - % who attended competitive, less competitive, and least competitive undergraduate schools	NA	- labor markets in New York State - urbanicity of school - proportion of students in poverty - proportion of minority students - proportion of non-English language speakers

Ascher & Fruchter (2001)	New York City public schools	- licensure status - years of experience - advanced degrees - teacher absentee rate	NA	- performance on state standardized assessments
Boyd, Lankford, Loeb, Rockoff, & Wyckoff (2007)	New York City public schools	- years of experience - selectivity of undergraduate program - certification - SAT scores - performance on state teacher exam - pathway into teaching	- gender - ethnicity - age	- school average performance on state and city exams - proportion of students in poverty - proportion of minority students - expenditures per pupil
Clotfelter, Ladd, & Vigdor (2005)	North Carolina public schools	- years of experience - selectivity of undergraduate program - licensure type - performance on state teacher exam	NA	- proportion of minority students

| Clotfelter, Ladd, Vigdor, & Wheeler (2007a) | North Carolina public schools | - years of experience

- licensure type

- certification type

- National Board certification

- graduate degree

- selectivity of undergraduate program

- performance on state teacher exam | - race

- gender | - proportion of students in poverty

- proportion of minority students |

Table 3

Operational Definitions for the Amount of Teacher Preparation Received by Teachers in the Analytical Subsample

Amount of Preparation	Boe et al. (2002)	Present Study
Extensive Teacher Preparation	(a) 10 or more weeks of practice teaching and all 4 of the components	(a) 8 or more weeks of practice teaching and all 4 of the components
	(b) 10 or more weeks of practice teaching and 3 of the 4 of the components	(b) 8 or more weeks of practice teaching and 3 of the 4 of the components
	(c) 10 or more weeks of practice teaching and less than 3 of the 4 components	
	(d) 9 or more weeks of practice teaching and all 4 of the components	

Some Teacher Preparation	(a) 5-9 weeks of practice teaching and some of the 4 components	(a) 1-7 weeks of practice teaching and all or some of the four of the components
	(b) 1-4 weeks of practice teaching and all or some of the 4 components	(b) No practice teaching, but all four of the components
	(c) No practice teaching but all 4 components	(c) 8 or more weeks of practice teaching and less than 3 of the components
Little or No Teacher Preparation	(a) Teachers with no practice teaching and some of the 4 components	(a) No practice teaching and less than 4 of the components
	(b) Teachers with no practice teaching and none of the 4 components	(b) No practice teaching and none of the 4 components
		(c) 1-7 weeks of practice teaching and none of the four of the components

Table 4

NCES-Defined Categories for Describing School Levels

SCHLEVE2	SCHLEVEL
Primary: schools with at least one grade lower than 5 and no grade higher than 8	Elementary: if school has any of grades K-6 and none of grades 9-12
Middle: schools with no grade lower than 5 and no grade higher than 8	NA
High: schools with no grade lower than 7 and at least one grade higher than 8	Secondary: if school has any of grades 7-12 and none of grades 9-12
Combined: schools with at least one grade lower than 7 and at least one grade higher than 8; schools with only ungraded classes	Combined: all other cases

Table 5

Number of Schools by Quartile and School Level (percentages indicate the proportion the cell represents of the full analytic sample)

Level of School	Quartile 1 (Low Poverty)	Quartile 2	Quartile 3	Quartile 4 (High Poverty)	Total
Primary	549	556	553	801	2459
	(10.4%)	(10.6%)	(10.5%)	(15.2%)	(46.7%)
Middle	250	315	355	237	1157
	(4.8%)	(6.0%)	(6.7%)	(4.5%)	(22.0%)
High School	442	378	286	161	1267
	(8.4%)	(7.2%)	(5.4%)	(3.1%)	(24.1%)
Combined	76	67	121	115	379
	(1.4%)	(1.3%)	(2.3%)	(2.2%)	(7.2%)
Total	1317	1316	1315	1314	5262
	(25.0%)	(25.0%)	(25.0%)	(25.0%)	(100%)

Table 6

Description of Eight Locale Codes Based on the 2000 Decennial Census Data (taken from Tourkin et al., 2007)

Code	Name	Description
1	Large City	A central city of a Core Based Statistical Area (CBSA) or Consolidated Statistical Area (CSA), with the city having a population greater than or equal to 250,000
2	Mid-size City	A central city of a CBSA or CSA, with the city having a population less than 250,000
3	Urban Fringe of a Large City	Any incorporated place, Census designated place, or non-place territory within a CBSA or CSA of a Large City and defined as urban by the Census Bureau
4	Urban Fringe of a Mid-size City	Any incorporated place, Census designated place, or non-place territory within a CBSA or CSA of a Mid-size City and defined as urban by the Census Bureau
5	Large Town	An incorporated place or Census designated place with a population greater than or equal to 25,000 located outside a CBSA or CSA
6	Small Town	An incorporated place or Census designated place with a population less than 25,000 and greater than or equal to 2,500 and located outside a CBSA or CSA

| 7 | Rural, outside CBSA | Any incorporated place, Census designated place, or non-place territory not within a CBSA or CSA of a Large or Mid-size city and defined as rural by the Census Bureau |
| 8 | Rural, inside CBSA | Any incorporated place, Census designated place, or non-place territory within a CBSA or CSA of a Large or Mid-size city and defined as rural by the Census Bureau |

Table 7

Main Teaching Assignments of Respondents in the Full SASS:04 Sample (unweighted)

	SASS:04 Sample		Special Educators	
Position	Frequency (*f*)	Percent (%)	*f*	%
Regular full-time teacher	39,333	91.0	4819	88.3
Regular part-time teacher	1,650	3.8	138	2.5
Itinerant teacher	1,186	2.7	258	4.7
Long-term substitute	250	0.6	48	.9
Administrator	174	0.4	11	.2
Library media specialist or librarian	84	0.2	1	<.01
Other professional staff	550	1.3	176	3.2
Support staff	17	<.01	4	.1
Total	*43,244*	*100*	*5,455*	*100*

Table 8

Positions Held by Individuals Marking Special Education as Their Main Teaching

Assignment in the SASS:04 Sample

	Unweighted		Weighted	
Position	*f*	%	*f*	%
Regular full-time teacher	4,819	91.6	4,730	89.9
Regular part-time teacher	138	2.6	141	2.7
Itinerant teacher	258	4.9	309	5.9
Long-term substitute	48	0.9	83	1.6
Total	*5,263*	*100*	*5,263*	*100*

Table 9

Demographic Information for the Sample of Special Education Teachers Represented in

the SASS:04 dataset (N=5,263)

	Analytic Sample	
Demographic Characteristic	n	%
Age at the time of SASS:04 (years)		
20-30	1,001	19.0
31-40	1,212	23.0
41-50	1,651	31.4
Over 50	1,399	26.6
Gender		
Female	4,432	84.2
Male	831	15.8
Race/ethnicity-1		
White, non-Hispanic	4,391	83.4
Black, non-Hispanic	479	9.1
Asian, non-Hispanic	40	0.8
American Indian/Alaska Native, non-Hispanic	28	0.5
Native Hawaiian or Other Pacific Islander, non-Hispanic	16	0.3
Hispanic, single or multiple races	272	5.2
Multiple races, non-Hispanic	36	0.7

Race/ethnicity-2

White, non-Hispanic	4,391	83.4
Minority	872	16.6
Total	*5,263*	*100*

Table 10

Qualifications of the Sample of Special Education Teachers in the SASS:04 (N=5,623)

Teacher Qualifications	n	%
Amount of Teacher Preparation		
None	221	4.2
Some	656	12.5
Extensive	4,386	83.3
Degree Major		
Neither	897	17.0
General Education	475	9.0
Special Education	3,892	73.9
Degree Level		
Bachelor's or less	2,424	46.1
Master's or higher	2,839	53.9
Certification in Special Ed		
Not certified	835	15.9
Fully certified	4428	84.1
Certification in Any Subject		
Not certified	313	5.9
Fully certified	4,950	94.1

Preparation Program

No preparation	326	6.2
Non-traditional/Alternative	941	17.9
Traditional/Degree-focused	3,995	75.9

Years of Teaching Experience

3 years or less	884	16.8
More than 3 years	4,379	83.2
Total	*5,263*	*100*

Table 11

Qualifications of Special Education Teachers in Low Poverty Schools Versus High

Poverty Schools

Teacher Qualifications	χ^2	p	Cramer's V	p	τ	p
Amount of Teacher Preparation	83.18	<.001	.18	<.001	.03	<.001
Degree Major	62.43	<.001	.15	<.001	.02	<.001
Degree Level	3.97	ns	ns	ns	ns	ns
Certification in Special Ed	23.32	<.001	.09	<.001	.01	<.001
Certification in Any Subject Area	28.11	<.001	.10	<.001	.01	<.001
Type of Preparation Program	74.50	<.001	.17	<.001	.03	<.001
Years of Teaching Experience	8.56	.003	.06	.003	<.01	.003

*p<.05, with Sidak (1967) adjustment p<.007

Table 12

Qualifications of Special Education Teachers in Suburban Schools Versus Urban Schools

Teacher Qualifications	χ^2	p	Cramer's V	p	τ	p
Amount of Teacher Preparation	30.20	<.001	.08	<.001	.01	<.001
Degree Major	16.76	<.001	.06	<.001	<.01	<.001
Degree Level	.84	ns	ns	ns	ns	ns
Certification in Special Ed	12.42	<.001	.05	<.001	<.01	<.001
Certification in Any Subject Area	10.30	.001	.05	.001	<.01	.001
Type of Preparation Program	2.38	ns	ns	ns	ns	ns
Years of Teaching Experience	.16	ns	ns	ns	ns	ns

*p<.05, with Sidak (1967) adjustment p<.007

Table 13

Qualifications of Special Education Teachers in Suburban Schools versus Rural Schools

Teacher Qualifications	χ^2	*p*	Cramer's V	*p*	τ	*p*
Amount of Teacher Preparation	.91	ns	ns	ns	ns	ns
Degree Major	10.16	.006	.05	.006	<.01	.006
Degree Level	8.79	.003	.05	.003	<.01	.003
Certification in Special Ed	1.07	ns	ns	ns	ns	ns
Certification in Any Subject Area	.08	ns	ns	ns	ns	ns
Type of Preparation Program	1.25	ns	ns	ns	ns	ns
Years of Teaching Experience	2.92	ns	ns	ns	ns	ns

*p<.05, with Sidak (1967) adjustment p<.007

Table 14

Qualifications of Special Education Teachers in Urban Schools versus Rural Schools

Teacher Qualifications	χ^2	p	Cramer's V	p	τ	p
Amount of Teacher Preparation	9.93	ns	ns	ns	ns	ns
Degree Major	11.04	.004	.07	.004	.01	.004
Degree Level	4.13	ns	ns	ns	ns	ns
Certification in Special Ed	2.71	ns	ns	ns	ns	ns
Certification in Any Subject Area	6.36	ns	ns	ns	ns	ns
Type of Preparation Program	.02	ns	ns	ns	ns	ns
Years of Teaching Experience	3.49	ns	ns	ns	ns	ns

*$p<.05$, with Sidak (1967) adjustment $p<.007$

Table 15

Summary of major findings for differences in teacher qualifications with moderate effect sizes (reported as percentages)

	Amount of Preparation			Degree Major			Degree Level		Cert- Special Ed		Cert- Any	
	None	Some	Ext.	No	Gen	Spec	BA	MA+	No Cert	Full	No	Full
Gender		*			**					**		
Female				14.5	9.0	76.5			13.9	86.1		
Male				30.8	9.0	60.2			26.7	73.3		
Age		**			**			**		*		**
21-30	8.6	9.5	81.9	23.9	7.9	68.2	70.1	29.9			10.9	89.1
31-40	5.2	14.9	79.9	20.8	9.2	70.0	49.1	50.9			7.4	92.6
41-50	2.0	10.2	87.8	11.6	7.8	80.7	40.8	59.2			4.5	95.5
51+	2.9	15.0	82.1	15.3	11.2	73.5	32.5	67.5			2.9	97.1
Race/ethnicity		**			**			*		*		*
White	3.0	11.3	85.7	14.3	9.0	76.7						
Minority	10.2	18.7	71.1	31.1	9.2	59.7						

	Col 1			Col 2			Col 3		Col 4		Col 5	
Assignment	*			**			**		**		**	
Regular				16.3	8.4	75.2	46.8	53.2	14.4	85.6	5.5	94.5
LT sub				20.0	17.4	62.6	28.2	71.8	26.5	73.5	4.9	95.1
Itinerant				48.2	12.0	39.8	67.5	32.5	60.2	39.8	38.6	61.4
School Level				*								
Primary												
Middle												
High												
Combined												
Poverty Quart	**			*					*		*	
1 (Low)	2.7	8.0	89.3									
2	2.4	13.4	84.3									
3	4.5	11.6	83.9									
4 (High)	7.2	16.9	75.9									
Urbanicity	*			*					*		*	
Urban												

Suburban				
Rural				

* weak association (Cramer's V <.1)   ** moderate association (Cramer's V .1- .3)

Table 15(cont'd)

Summary of major findings for differences in teacher qualifications with moderate effect sizes (reported as percentages)

	Preparation Program			Years Teaching	
	No program	Non-trad/alt	Trad/degree	3 years or less	More than 3 years
Gender		*			
Female					
Male					
Age		*		**	
21-30				51.0	49.0
31-40				14.8	85.2
41-50				8.0	92.0
51+				4.5	95.5
Race/ethnicity		**		**	
White	5.1	16.5	78.4	14.9	85.1
Minority	11.9	24.7	63.3	26.5	73.5

Assignment	*		**	
Regular			16.7	83.3
LT substitute			9.1	90.9
Itinerant			54.2	45.8
School Level	*			
Primary				
Middle				
High				
Combined				
Poverty Quart	*		*	
1 (Low)				
2				
3				
4 (High)				
Urbanicity				
Urban				

Suburban				
Rural				

* weak association (Cramer's V <.1)   ** moderate association (Cramer's V .1- .3)

Table 16

Spearman Rho Correlations Among the Special Education Teacher Qualification Measures and the Demographic Variables

	Amt of Prep	Degree Major	Degree Level	Special Ed Cert	Any Cert	Prog Type	Years Exper	Age	Gender	Race	Assign
Degree Major	.34*										
Degree Level	.09*	.29*									
Special Ed Cert	.12*	.37*	.12*								
Any Type Cert	.17*	.25*	.11*	.58*							
Program Type	.33*	.28*	.20*	.06*	.09*						
Years Exper	.19*	.27*	.25*	.20*	.26*	.14*					
Age	.03*	.07*	.25*	.07*	.11*	.02	.38*				
Gender	.05*	.14*	.02	.13*	.03*	.06*	.02	-.03*			
Race	.15*	.16*	.08*	.08*	.09*	.14*	.12*	.03	.03*		
Assignment	.02	-.11*	.04*	-.15*	-.09*	-.07*	-.03	-.01	<.01	-.03*	
School Level	.02	.03	.02	-.01	.01	.03	.04*	.07*	-.21*	<.01	-.13*

*p<.05

Table 15

The Odds Ratios for a Special Education Teacher Teaching in a High Poverty School on the Teacher Demographic Characteristics and Qualification Variables

Independent Variables	Model 1	Model 2	Model 3
Intercept	.21*	.21*	.21*
Minority	3.89*	3.92*	3.97*
No program	.95	.97	.96
Alternative program	1.35*	1.33*	1.29*
Little/no preparation	1.51*	1.40	1.37
Some preparation	1.38*	1.36*	1.38*
Long-term substitute	1.72*	1.76*	1.48
Itinerant teacher	.94	.94	.94
Novice (3 years teaching or less)	.92	.80	.96
No special education certificate	1.33*	1.34*	1.42*
No certificate (any)	1.00	.98	2.06*
No education major	1.09	.98	.90
General education major	1.00	1.01	1.04
No education major by novice		1.49*	1.91*
No certification by novice			.27*
No special education certification by novice			.72

*p<.05

Table 18

The Odds Ratios for a Special Education Teacher Teaching in an Urban School on the

Teacher Demographic Characteristics and Qualification Variables

Independent Variables	Model 1	Model 2	Model 3	Model 4
Intercept	.34*	.35*	.35*	.35*
Minority	3.81*	3.83*	3.83*	3.85*
No program	.79	.78	.79	.80
Alternative program	.75*	.73*	.73*	.75*
Little/no preparation	1.61*	1.48*	1.42*	.64
Some preparation	1.25*	1.23*	1.21	1.00
Long-term substitute	2.66*	2.75*	3.05*	3.90*
Itinerant teacher	.63*	.64*	.64*	.65*
Novice	.79*	.64*	.66*	.55*
No special education certificate	1.15	1.15	1.36*	1.36*
No certificate (any)	1.04	1.01	.69	.70
No education major	1.05	.92	.92	1.00
General education major	.97	.94	.90	.92
No education major by novice		1.73*	1.88*	.92
General education major by novice		1.31	1.78	1.82
No certification by novice			3.49*	2.70*
No special education cert by novice			.37*	.44*
Little/no preparation by novice				6.32*
Some preparation by novice				3.83*

Table 19

The Odds Ratios for a Special Education Teacher Teaching in a Rural School on the

Teacher Demographic Characteristics and Qualification Variables

Independent Variables	Model 1	Model 2
Intercept	.21*	.21*
Minority	.46*	.47
No program	1.24	1.23
Alternative program	1.01	1.01
Little/no preparation	1.12	1.04
Some preparation	.95	1.07
Long-term substitute	.10*	.09*
Itinerant teacher	1.21	1.20
Novice	.88	.97
No education major	1.08	1.12
General education major	1.47	1.46*
Some preparation by novice		.43

*p<.05

Table 20

Major findings from the analysis of teacher qualification measures by the demographic characteristic, teaching position, and school characteristics examined

Demographic characteristic	
Gender	o 30% of male special education teachers did not hold a degree in either special or general education (compared to only 14.5% of female special educators)
	o Twice the proportion of male special educators did not hold a certificate in special education (26.7% of males compared to 13.9% of females)
Age	o Special educators in the 41-50 age group were most qualified; 80% of teachers in this age group had a degree in special education compared to only 68-70% of teachers 40 years or younger and 73.5% of teachers over age 51.
	o Only 12% of teachers aged 41-50 had some or no teacher preparation compared to 18-20% of teachers 40 years or younger and about 18% of teachers over age 51.
	o Teachers under age 30 appeared least likely to be certified in special education (80%) or in any subject area (89.1%) and to enter the classroom without any preparation (8.8%).
Race/	o White, non-Hispanic special education teachers were more qualified in general than special educators

ethnicity	from minority groups
	o Nearly 30% of minority special educators had only some or no teacher preparation prior to entering the classroom compared to approximately 14%
	o More than double the minority special educators had no degree in general or special education than white special educators (31.1% versus 14.3%) and did not complete any type of preparation program (11.9% versus 5.1%)
	o A larger proportion of white special educators had more than three years of teaching experience (85.1%) compared with minority teachers (73.5%).
Teaching Position	
Assignment	o A larger proportion of itinerant special education teachers compared to regular full or part-time special educators completed extensive teacher preparation programs prior to entering teaching (89.0% versus 83.1%), held a master's degree or higher (71.8% versus 53.2%), and had more than three years of experience (90.9% versus 83.3%).
	o Regular special education teachers were more likely than itinerant teachers to have a degree (75.2% versus 62.6%) and certification (85.6% versus 73.5%) in special education
	o Long-term substitutes were least qualified overall; a large proportion did not have a degree in special

education (39.8%), with many of them coming from traditional/degree-focused preparation programs

(65.5%)

School level	o	Special educators from combined schools more often held special education degrees (78.6% compared to 72-76%) and slightly more completed traditional preparation programs (78.4% compared to 75-77%) than their peers in other types of schools
	o	A higher proportion of teachers in high schools had at least three years of teaching experience.

School Characteristics

Poverty Quartile	o	Approximately 14% more special educators in the low poverty schools had extensive preparation than those in high poverty schools
	o	About a quarter of the special educators from high poverty schools had only some or no preparation in comparison with 10-15% of special education teachers from other schools.
	o	In the low poverty quartile, approximately 83% of special educators completed a traditional/degree-focused preparation program; in comparison, 70% of special educators completed a traditional/degree-focused program with many more completing non-traditional/alternative programs than special educators in low poverty schools (23.7% versus 13.3%)
	o	A much larger proportion of special educators in low poverty schools had full certification in special

education (86.3%) than in high poverty schools (79.2%)

Urbanicity	o Fewer special educators in urban schools met the qualification standards than do special educators in suburban and rural schools
	o 84-85% of special educators in suburban and rural schools began teaching with extensive teacher preparation and less than 4% began with no preparation; about 80% of urban special educators began teaching with the same amount of preparation and 6% began with no preparation
	o About 3% more special educators in suburban and rural schools than in urban schools held special education certification
	o A larger proportion of special educators in rural schools held a general education degree (11.7% compared to less than 9% in urban and suburban schools), but the largest proportion of special educators with no degree in education were in urban schools (20.3% compared to about 16% in suburban and rural schools).

FIGURES

Figure 1

Questionnaires Used in the SASS:04 for Public and Private Schools

Public Schools

Private Schools

Or:
Unified School Questionnaire

School District Questionnaire

School Questionnaire

CCD

NAEP

School Principal Questionnaire

School Teacher Questionnaire

School Media/ Library Questionnaire

Teacher Follow-Up Survey

School Questionnaire

School Principal Questionnaire

School Teacher Questionnaire

School Media/ Library Questionnaire

Teacher Follow-Up Survey

Figure 2

Number of Special Education Teachers in the Analytic Sample by Urbanicity
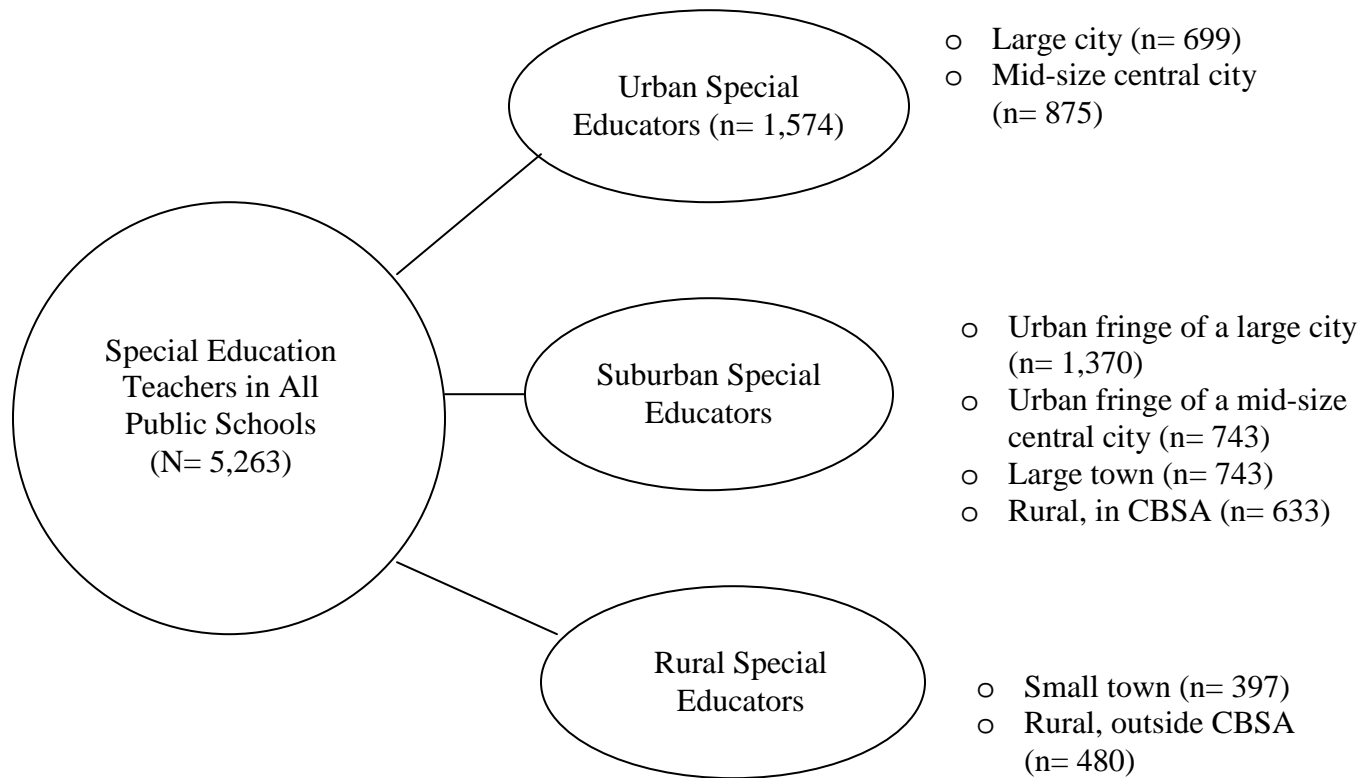
Figure 3

The Amount of Preparation of Special Educators by School Poverty Quartile

Amount of Preparation
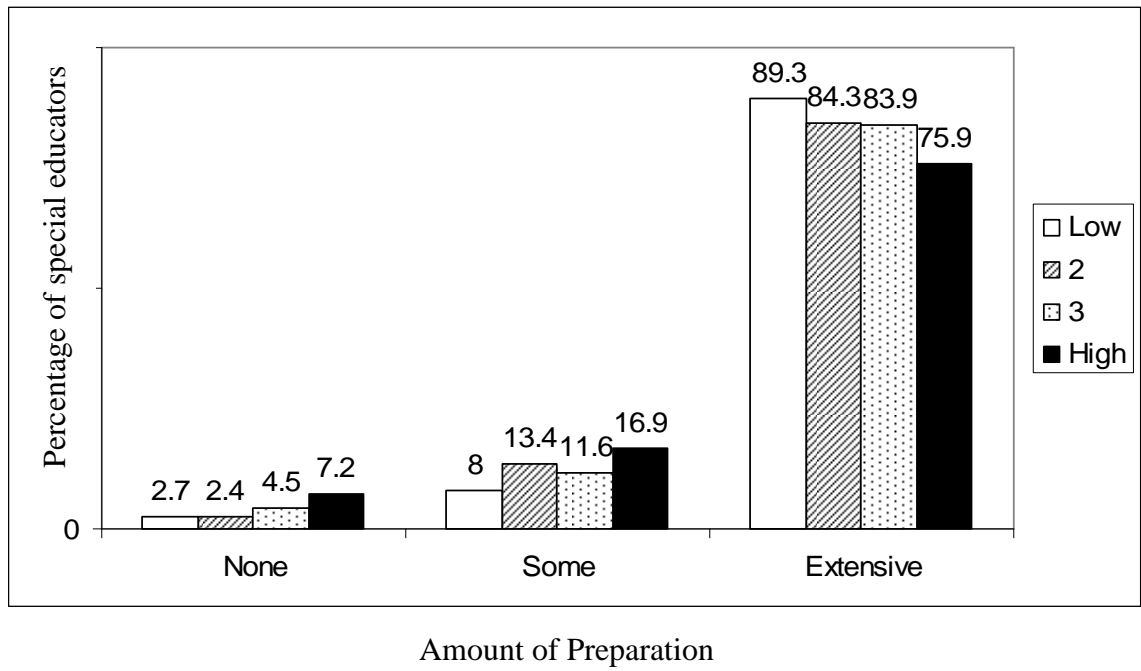
Figure 4

The Qualifications of Special Educators: Low Poverty Quartile versus High Poverty Quartile Schools
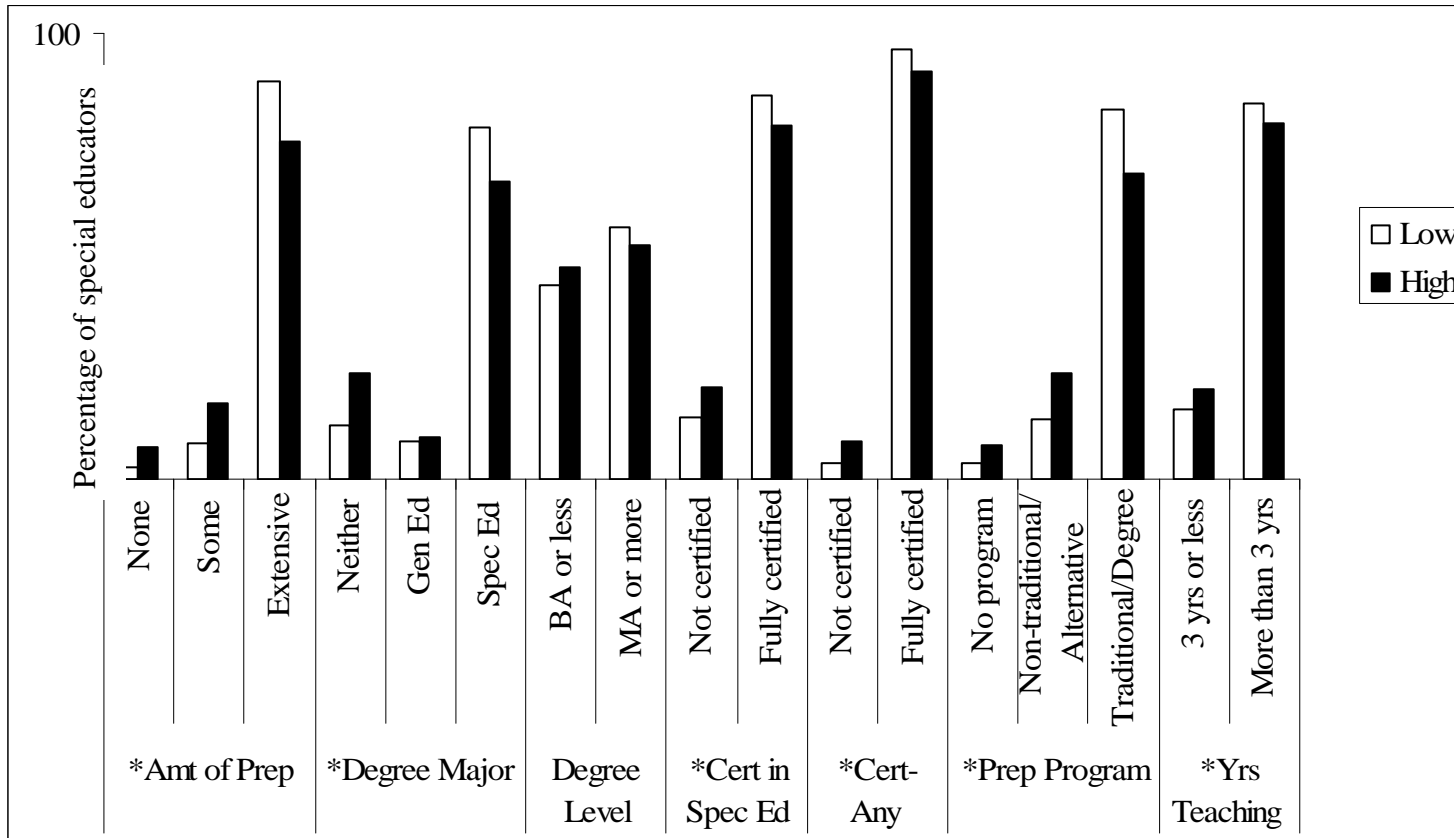
Qualifications of Special Education Teachers (*$p<.05$, with Sidak (1967) adjustment $p<.007$)

Figure 5

The Qualifications of Special Educators: by Urbanicity
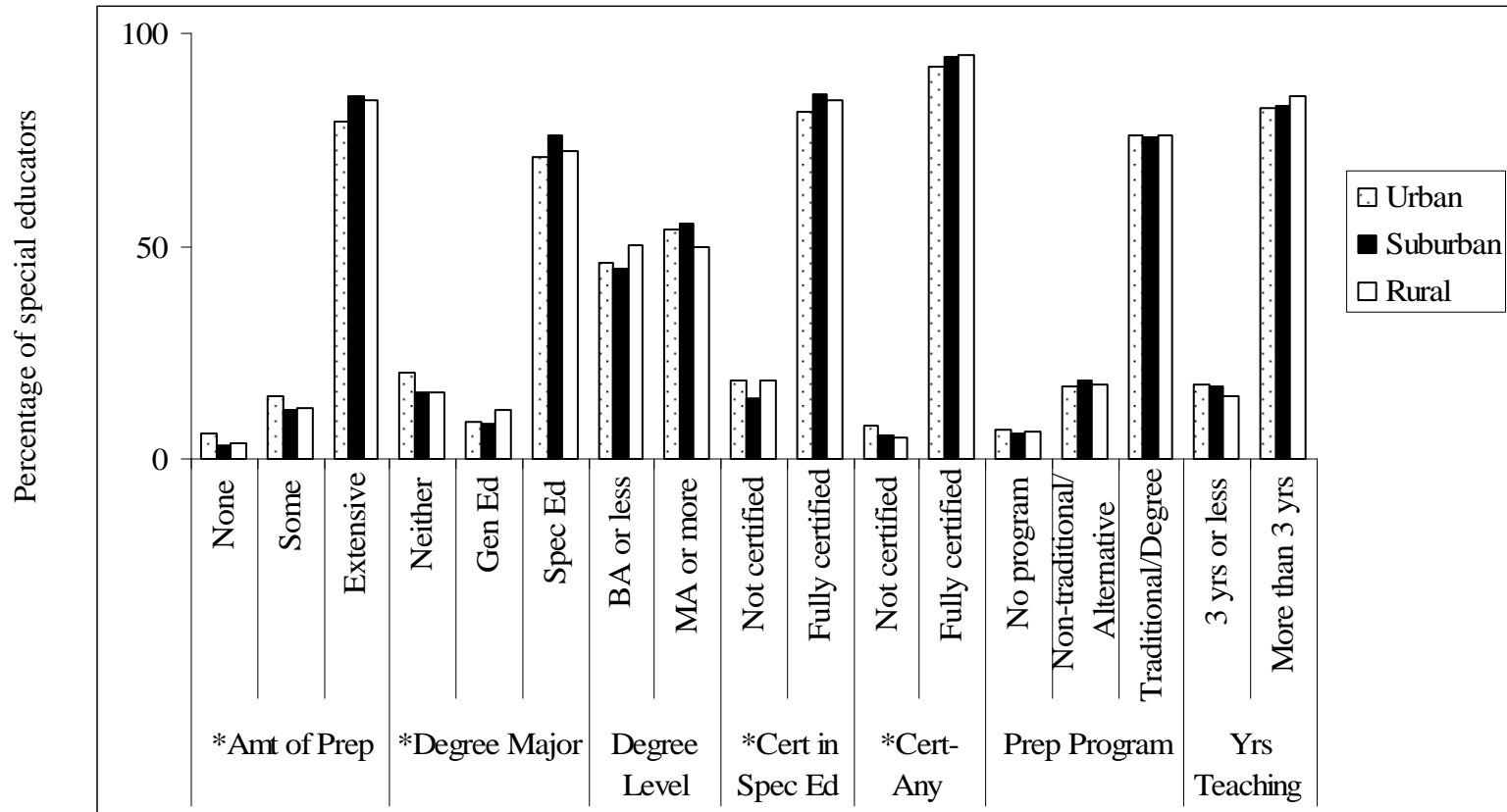
Qualifications of Special Education Teachers (*$p<.05$, with Sidak (1967) adjustment $p<.007$)

Appendix A

Additional Information on the Schools and Staffing Survey

Administered by the NCES, the SASS collects data on elementary and secondary

school teachers, their principals, and the schools and districts in which they work

(Tourkin et al, 2007). First conducted in the early 1980s, the SASS is designed to provide

the most comprehensive data on American schooling available (Tourkin et al.). The

questionnaires provide information on the characteristics and qualifications of teachers,

their class assignments, details about the school and district in which they teach, and the

types of equipment available through the school media center.

Preceding the first administration of the SASS, NCES conducted a series of

surveys on schooling in America (Tourkin et al, 2007). Administered over a three-year

period, the series included five separate surveys: (a) the Survey of Teacher Demand and

Shortage (1983-84), (b) the Public School Survey- School Questionnaire (1984-85), (c)

the National Survey of Private Schools- School Questionnaire (1985-86), (d) the Public

School Survey- Teacher Questionnaire (1984-85), and (e) the National Survey of Private

Schools- Teacher Questionnaire (1985-86). Even amid collecting data, NCES solicited

comments as to how the surveys could be redesigned to provide a better and more

comprehensive dataset. Results and suggestions for redesigning the survey program were

described in the 1985 report, "Excellence in Schools Surveys and Analysis Study"

(Tourkin et al, 2007), ultimately leading to the creation of the SASS.

The first administration of SASS was in 1987-88, followed by additional

administrations in 1990-91, 1993-94, and 1999-2000 (Tourkin et al, 2007). The six-year

break between the third and fourth administrations allowed NCES to again redesign the

instruments, correcting methodological flaws and altering the substance of the questionnaires to go beyond issues related to teacher shortages. Following the redesign, NCES intended to administer SASS every other year, however, budgetary and time constraints forced NCES to limit conducting the surveys to every four years. The most current administration of the SASS questionnaires is being conducted during the 2007-08 school year; the data will be available for investigation in 2009.

The SASS dataset incorporates several different questionnaires to capture information about elementary and secondary education in the U.S. (Tourkin et al, 2007). Teachers, their principals, and someone knowledgeable about the school and their library and media centers complete separate questionnaires providing information about their positions and the resources available to them. An additional questionnaire about the school district is completed by someone from the district office. The SASS includes both public and private schools, providing nationally representative data for policymakers and researchers to investigate such things as the characteristics of the supply of teachers and principals, the presence of professional development and mentorship programs, and the allocation of resources, such as computers and library materials. The following year, the TFS survey is mailed to a limited sample of teachers to provide information on the retention and attrition of teachers.

Researchers, administrators, and other interested in the SASS findings can access the data through two sources (Tourkin et al., 2007). The first version of the data is meant to be used with the Data Analysis System (DAS), a free software program available for public use through the NCES website. The SASS:04 data can be downloaded into the DAS, allowing users to build charts and estimate covariance among variables using

information from SASS:04 and other NCES-funded datasets (for instance, the National Education Longitudinal Study or the Education Longitudinal Study). The second version of the SASS:04 dataset is the restricted-access dataset from NCES. Users must obtain permission from NCES to access this data and maintain the database on a stand-alone computer since it includes complete responses and person-identifiable information for the SASS:04 dataset. The restricted-access version includes sampling weights, allowing researchers to calculate national averages. The restricted-access dataset uses matched control number variables so that multiple surveys can be used together in an investigation (for example, private school teacher and public schools teachers). This analysis used the restricted-access version of the SASS:04 dataset, combining variables from the Public School Survey with the Public School Teacher Survey.

Appendix B

SASS:04 Sampling Strategies for School and Teacher Selection

NCES developed a stratified probability sample design to ensure sufficient

numbers of schools at all levels. This allows estimates to be calculated on a number of

levels, including varying enrollment sizes, different geographic types, and different grade

ranges. Figure B1 provides an illustration of the selection process. The first level of

stratification was school type, with each school type labeled within the dataset. For

instance, BIA-funded schools were labeled Type A; schools with high American Indian

or Alaskan Native student enrollment were labeled Type B. The BIA-funded schools

(Type A schools) did not participate in the following stages since all of these schools

were included in the final sample to ensure adequate representation. The second stage

used the school type to stratify schools by state or by state and district. School types were

then stratified by grade level (elementary, secondary, or combined). Final allocations of

schools into the sample were based on enrollment, grade range, and school type

(traditional public, public charter, and schools with high American Indian enrollment).

An algorithm using a probability proportionate to school enrollment enabled schools

from each level of stratification to be selected, allowing adequate representation of

schools of varying enrollment ranges and grade levels.

Figure B1

Sample Selection Process for Public Schools Followed in the SASS:04
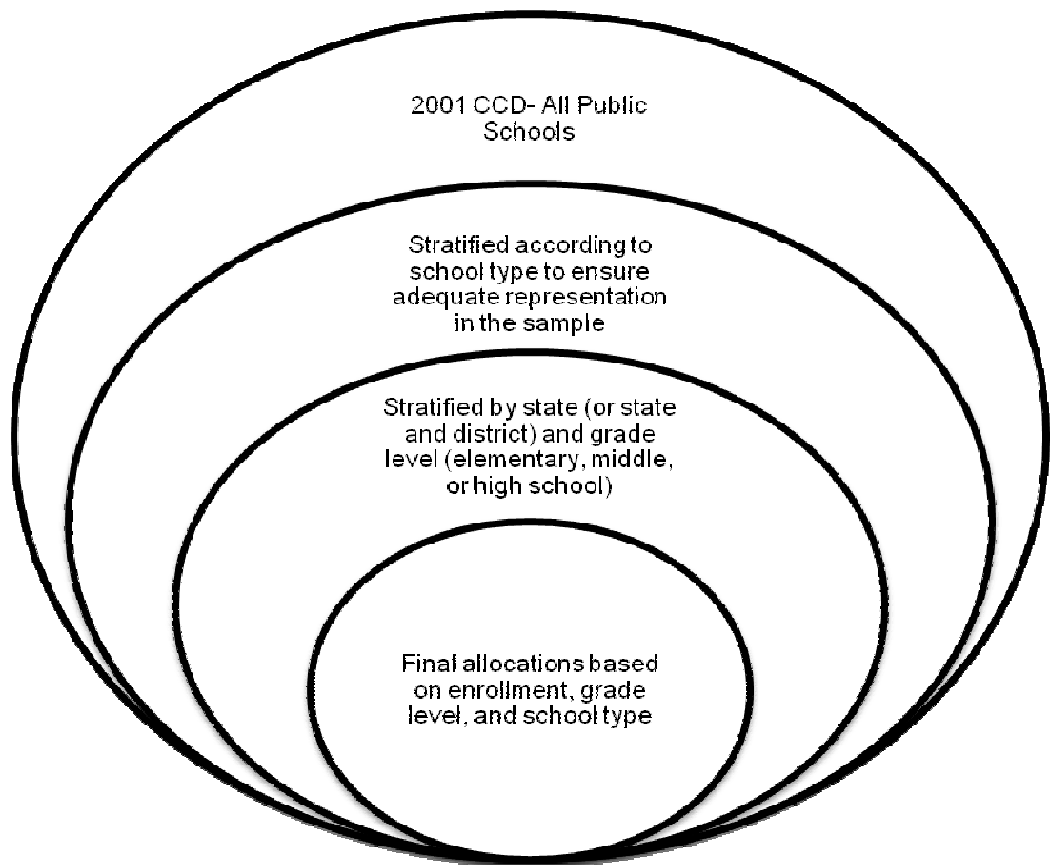
Prior to the initial site visits made by the field coordinators, NCES determined the

number of teachers who would be included from each school and the method for

selecting teachers. During the initial visit to selected schools, field coordinators presented

information about the SASS design to administrators and obtained a roster of current

teachers from either the administrator or someone assigned by the administrator (for

instance, a school secretary). Field coordinators used the roster to enter information about

the teachers, such as years of experience, teaching status, race/ethnicity, and subject

matter taught, into the Teacher Listing Instrument on personal laptop computers. Field

coordinators then identified which teachers to include in the sample on site, immediately

providing teachers with the Teacher Questionnaire, survey information, and their contact

information. Table B1 provides final response rates for the questionnaires to be used in

this analysis: the Public School Teacher Listing Form, Teacher Questionnaire, School

Questionnaire, and Unified School Questionnaire.

Table B1

Response Rates for Selected Questionnaires from the SASS:04

Questionnaire	Final Response Rate
Teacher Listing Form	89.4%
Teacher Questionnaire	84.0%
School Questionnaire	80.5%
Unified School Questionnaire	74.4%

Several teacher characteristics were used for sample selection, following a

hierarchical order based on sampling priorities. Based on the Teacher Listing Instrument,

teachers were stratified according to four characteristics, ensuring adequate

representation of historically underrepresented groups in the final sample. The

stratification included: 1) Asian or Pacific Islander; 2) American Indian or Pacific

Islander; 3) New (3 years or less in the teaching profession); and 4) Experienced (greater

than 3 years of teaching).NCES established goal numbers for specific groups; for

instance, it was expected that the SASS:04 teacher sample would include at least 1,600

teachers of either Asian or Pacific Islander or American Indian descent. For each sector,

at least 2,300 teachers needed to be designated as "new" to the teaching profession

(within their first three years of teaching). On average, three to eight teachers were select

per school, with a minimum of one teacher per school and a maximum of 20 teachers.

Appendix C

Questions from the SASS:04 Public School Teacher Questionnaire

Questions for Sample Identification		
#	Question	Possible Responses
1	How do you classify your position at THIS school, that is, the activity at which you spend most of your time during this school year?	Regular full-time teacher Regular part-time teacher Itinerant teacher Long-term substitute Short-term substitute Student teacher Teacher aide Administrator Library media specialist or librarian Other professional staff Support staff
15/17	This school year, what is your MAIN teaching assignment field at this school?	3 General Education options; 69 Subject Matter Specific choices (see Appendix D)

Questions about Teaching Experience		
#	Question	Possible Responses
7	In what year did you begin teaching in THIS school?	Year
9a	How many years have you worked as a FULL-TIME elementary or secondary teacher in PUBLIC, CHARTER, and/or INDIAN schools?	None or number of years
9b	How many years have you worked as a PART-TIME elementary or secondary teacher in PUBLIC, CHARTER, and/or INDIAN schools?	None or number of years
10b	How many years did you work FULL-TIME in PRIVATE schools?	None or number of years
10c	How many years did you work PART-TIME IN PRIVATE schools?	None or number of years

Questions about Teaching Preparation		
#	Question	Possible Responses
20a	Do you have a bachelor's degree?	Yes/No
20d	What was your major field of study?	The Teacher Questionnaire uses the same for codes for both *content area* and *certification* (See Appendix E)
20e	Did you have a second major field of study?	Yes/No
20f	What was your second major field of study?	(See Appendix E)
22a	Do you have a master's degree?	Yes/No
22d	What was your major field of study?	(See Appendix E)
23a	Have you earned any of the degrees listed below? 23a(1) Vocational certificate? 23a(2) Associate's degree? 23a(3) Second bachelor's degree? 23a(4) Second master's degree? 23a(5) Educational specialist or professional development? 23a(6) Certificate of Advanced Graduate Studies? 23a(7) Doctorate or first professional degree (PhD, EdD, MD, JD, DDS)	Yes/No; Enter code from chart (see Appendix E)
25	Did your preparation for teaching include: 25a. Coursework in how to select and adapt instructional materials? 25b. Coursework in learning theory or psychology appropriate to the age of students you teach? 25c. Your observation of other classroom teaching? 25d. Formal feedback on your teaching?	Yes/No
26	How long did your practice teaching last?	1= I had no practice teaching 2= 4 weeks or less 3= 5-7 weeks 4= 8-11 weeks 5= 12 weeks or more
27	Have you ever taken any graduate or undergraduate courses that focused on teaching methods or teaching strategies?	Yes/No

29	Which of the following describes how you obtained the teaching methods or teaching strategies coursework?	Through an "alternative" program… Through a bachelor's degree granting program Through a 5th year program… Through a master's degree granting program Through individual courses Other….

Questions about Teaching Certification

#	Question	Possible Responses
30a	Which of the following describes the teaching certificate you currently hold in this state?	The Teacher Questionnaire uses the same for codes for both *content area* and *certification* (See Appendix E)
30b(1)	Some certificates may allow you to teach in multiple content areas. In what content area(s) does the teaching certificate marked above allow you to teach in this state?	
30c(1)	If there is an additional content area that the certificate described above allows you to teach, please list below.	
30d(1)	Some certificates may allow you to teach in multiple content areas. In what content area(s) does the teaching certificate marked above allow you to teach in this state?	
30d(2)	If there is an additional content area that the certificate described above allows you to teach, please list below.	
30f(1)	If there is an additional content area that the certificate described above allows you to teach, please list below.	
30g(1)	If there is an additional content area that the certificate described above allows you to teach, please list it below.	

Appendix D

Questions from the SASS:04

Public School Questionnaire and Unified School Questionnaire

Question Number			
School	Unified	Question	Possible Responses
1	1	Which of the following grades are offered in this school?	*Mark all that apply: K-12th, ungraded*
2	2	Around the first of October, how many students in grades K-12 and comparable ungraded levels were enrolled in this school?	*Respondent should provide a numerical answer based on enrollment*
56	95	Does this school participate in the National School Lunch Program (that is, the federal free or reduced-price lunch program)?	Yes/No; if "yes" respondent should answer question 57
57	96	Around the first of October, how many students at this school were APPROVED for free or reduced-price lunches?	*Respondent can mark "none" or provide numerical answer*

Appendix E

Major Field of Study Codes, SASS:04 Public School Teacher Questionnaire

General Education			
Elementary Education		**Special Education**	
101	Early childhood/Pre-K, general	110	Special education, any
102	Elementary grades, general	**Other Education**	
Secondary Education		131	Administration
103	Middle grades, general	132	Counseling and guidance
104	Secondary grades, general	133	Educational psychology
		134	Policy studies
		135	School psychology
		136	Other non-subject matter specific
Subject Matter Specific			
Arts & Music		**Mathematics & Computer Science**	
141	Art/Arts or crafts	190	Mathematics
142	Art history	197	Computer science
143	Dance	**Natural Sciences**	
144	Drama/Theater	211	Biology/Life sciences
145	Music	212	Chemistry
English & Language Arts		213	Earth Sciences
151	Communications	214	Engineering
152	Composition	217	Physics
153	English	218	Other natural sciences
154	Journalism	**Social Sciences**	
155	Language arts	221	Anthropology
156	Linguistics	222	Area/Ethnic studies (not Native Amer stud)
157	Literature/Literary criticism	223	Criminal justice
158	Reading	224	Cultural studies
159	Speech	225	Economics
English as a Second Language		226	Geography
160	ESL/Bilingual education: General	227	Government/Civics
161	ESL/Bilingual education: Spanish	228	History
162	ESL/Bilingual education: Other lang.	229	International studies
Foreign Languages		230	Law
171	French	231	Native American studies
172	German	232	Political science
173	Latin	233	Psychology
174	Spanish	234	Sociology
175	Other foreign languages	235	Other social sciences
Health Education		**Vocational/Technical Education**	
181	Health education	241	Agriculture and natural resources
182	Physical education	242	Business/Office

Subject Matter Specific (cont'd)			
Vocational/Technical Education (cont'd)		**Miscellaneous**	
243	Keyboarding	261	Architecture
244	Marketing and distribution	263	Humanities/Liberal studies
245	Health occupations	264	Library/Information science
246	Construction trades	265	Military science/ROTC
247	Mechanics and repair	266	Philosophy
248	Drafting/Graphics/Printing	267	Religious studies/Theology/Divinity
249	Metals/Woods/Plastics, other precision production	**Other**	
250	Communications and other technologies	268	Other
251	Culinary arts/Hospitality		
252	Child care and education		
253	Personal and other services		
254	Family and consumer sciences educ.		
255	Industrial arts/Technology education		
256	Other vocational/technical education		

Teaching Assignment and Subject Matter Codes,

SASS:04 Public School Teacher Questionnaire

General Education			
Elementary Education		**Special Education**	
101	Early childhood/Pre-K, general	110	Special education, any
102	Elementary grades, general		
Subject Matter Specific			
Arts & Music		**Mathematics & Computer Science (cont'd)**	
141	Art/Arts or crafts	197	Computer science
143	Dance	198	Geometry
144	Drama/Theater	199	Pre-algebra
145	Music	200	Statistics and probability
English & Language Arts		201	Trigonometry
151	Communications	**Natural Sciences**	
152	Composition	210	Science, general
153	English	211	Biology/Life sciences
154	Journalism	212	Chemistry
155	Language arts	213	Earth Sciences
158	Reading	215	Integrated science
159	Speech	216	Physical science
English as a Second Language		217	Physics
160	ESL/Bilingual education: General	**Social Sciences**	
161	ESL/Bilingual education: Spanish	220	Social studies, general
162	ESL/Bilingual education: Other lang.	221	Anthropology
Foreign Languages		225	Economics
171	French	226	Geography
172	German	227	Government/Civics
173	Latin	228	History
174	Spanish	231	Native American studies
175	Other foreign languages	233	Psychology
Health Education		234	Sociology
181	Health education		
182	Physical education		
Mathematics & Computer Science			
191	Algebra, elementary		
192	Algebra, intermediate		
193	Algebra, advanced		
194	Basic and general mathematics		
195	Business and applied math		
196	Calculus and pre-calculus		

Subject Matter Specific (cont'd)			
Vocational/Technical Education		**Miscellaneous**	
241	Agriculture and natural resources	262	Driver education
242	Business/Office	264	Library/Information science
243	Keyboarding	265	Military science/ROTC
244	Marketing and distribution	266	Philosophy
245	Health occupations	267	Religious studies/Theology/Divinity
246	Construction trades	**Other**	
247	Mechanics and repair	268	Other
248	Drafting/Graphics/Printing		
249	Metals/Woods/Plastics, other precision		
250	Communications and other technology		
251	Culinary arts/Hospitality		
252	Child care and education		
253	Personal and other services		
254	Family and consumer sciences educ.		
255	Industrial arts/Technology education		
256	Other vocational/Technical education		

Appendix G

Recoding Protocol for Type of Preparation Program

The Teacher Questionnaire asks respondents to identify the type of program in which they received training in teaching methods or teaching strategies. Respondents could mark one of six available options; in addition, respondents who indicated not taking courses in teaching methods or strategies were to skip this question. Response information for this variable is presented in Table G1. Respondents indicating "other" were to specify a program in the space provided. To include this variable in the analysis the responses provided were analyzed and all categories were recoded into three new groups.

Table G1

Response Information for Type of Teacher Training Program Completed by Special Education Teachers in the SASS:04

Type of Program	n	%
Alternative Program	385	7.3
Bachelor's degree granting program	2330	44.3
Through a fifth year program	244	4.6
Through a Master's degree granting program	1297	24.6
Through individual courses	465	8.8
Other	233	4.4
Valid Skip	308	5.9

The new classification system has three categories: (a) traditional or degree-focused, (b) alternative or non-traditional program, and (c) no program. Responses from participants who indicated "other" (n= 233) were evaluated for inclusion in one of the three groups following a protocol. First, respondents who indicated "other" and wrote they received this training from a combination undergraduate and graduate training programs were put into the category of traditional, degree granting program. However, if a respondent indicated taking college-level courses, but did not indicate earning a degree they were coded in the second group (alternative or non-traditional). Second, respondents who listed an established alternative program (such as Teach for America) were put into the alternative or non-traditional program group. Third, if the respondent indicated only receiving an endorsement or a certificate, but did not indicate earning a degree concurrently, the response was coded alternative or non-traditional program.

Valid skips, persons indicating participating in workshops or reading books, and persons indicating "on the job training" were coded as no program (n=308). Table G2 presents the frequencies and percentages for the recoded categories along with examples of response information.

Table G2

Recoded Categories for Type of Teacher Training Program Completed for Participants who Indicated "Other" on the SASS:04 (N= 233)

Type of Preparation Program	n	%	Examples of Responses
Traditional, degree-granting	124		Both bachelors degree and individual course; through my second BA in special education; graduate program for SP. ED- endorsement; all B.S., MAED., Plus 35+ hours; I had classes in both my masters and bachelors degree; part of my undergraduate training
Alternative, non-traditional	91		Special education endorsement; teacher certification programs 3 years; courses needed to get a special education endorsement; state approval in field; I took methods through an alternative program; teachers aide for one year; Americorps year of service in bilingual education; additional college level courses
No program	18		Self-taught- read journals, take courses, think tank; on the job training; workshops, conferences; observing good teachers; classroom experience; adapted physical education workshops; personal experiences

Appendix H

Tables for Research Question One

Table H1

Contingency Tables for the Qualifications of Special Educators by Gender

Teacher Qualification	Gender				χ^2	*p*	Cramer's V	*p*
	Female		Male					
	n	%	n	%				
Expected	4432	84.2	831	15.8				
Amount of Teacher Preparation								
None	163	3.7	58	7.0	24.10	<.001	.07	<.001
Some	536	12.1	120	14.5				
Extensive	3734	84.2	652	78.6				
Degree Major								
Neither	641	14.5	256	30.8	134.95	<.001	.16	<.001
General Education	400	9.0	75	9.0				
Special Education	3391	76.5	500	60.2				

Degree Level

Bachelor's or less	2028	45.8	396	47.7	1.01	ns	ns	ns
Master's or higher	2404	54.2	435	52.3				

Cert in Special Ed

Not certified	614	13.9	222	26.7	86.63	<.001	.13	<.001
Fully certified	3818	86.1	609	73.3				

Cert in Any Subject Area

Not certified	251	5.7	62	7.5	4.09	ns	ns	ns
Fully certified	4812	94.3	768	92.5				

Preparation Program

No preparation	257	5.8	70	8.4	14.85	.001	.05	.001
Non-Traditional/Alternative	771	17.4	171	20.6				
Traditional/Degree-focused	3405	76.8	590	71.0				

Years of Teaching Experience

3 years or less	734	16.6	150	18.1	1.11	ns	ns	ns
More than 3 years	3698	83.4	681	81.9				

*p<.05, with Sidak (1967) adjustment *p*<.007

Table H2

Contingency Tables for the Qualifications of Special Educators by Age

Teacher Qualification	Age Ranges								χ^2	*p*	Cramer's V	*p*
	21-30		31-40		41-50		51+					
	n	%	n	%	n	%	n	%				
Expected	1001	19.0	1212	23.0	1651	31.4	1399	26.6				
Amount Teacher Prep												
None	86	8.6	63	5.2	33	2.0	40	2.9	106.60	<.001	.10	<.001
Some	95	9.5	181	14.9	169	10.2	210	15.0				
Extensive	820	81.9	968	79.9	1449	87.8	1149	82.1				
Degree Major												
Neither	239	23.9	252	20.8	191	11.6	214	15.3	97.35	<.001	.10	<.001
General Education	79	7.9	111	9.2	128	7.8	156	11.2				
Special Education	683	68.2	849	70.0	1331	80.7	1028	73.5				

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Degree Level

Bachelor's or less	701	70.1	595	49.1	674	40.8	454	32.5	359.15	<.001	.26	<.001
Master's or higher	299	29.9	617	50.9	977	59.2	944	67.5				

Cert- Spec Ed

Not certified	200	20.0	224	18.5	213	12.9	198	14.2	32.85	<.001	.08	<.001
Fully certified	801	80.0	988	81.5	1438	87.1	1201	85.8				

Cert- Any Subject

Not certified	109	10.9	90	7.4	74	4.5	40	2.9	78.55	<.001	.12	<.001
Fully certified	892	89.1	1123	92.6	1577	95.5	1358	97.1				

Preparation Program

No preparation	88	8.8	90	7.4	91	5.5	57	4.1	32.25	<.001	.06	<.001
Non-Traditional/Alt	157	15.7	227	18.7	283	17.1	273	19.5				
Traditional/Degree	755	75.5	895	73.8	1277	77.3	1068	76.4				

Yrs Experience

3 years or less	510	51.0	179	14.8	132	8.0	63	4.5	1083.31	<.001	.45	<.001
More than 3 years	490	49.0	1033	85.2	1519	92.0	1336	95.5				

*$p<.05$, with Sidak (1967) adjustment $p<.007$

Table H3

Contingency Tables for the Qualifications of Special Educators by Race/ethnicity

| Teacher Qualification | Race/ethnicity | | | | | | | |
| | White | | Minority | | | | | |
	n	%	n	%	χ^2	*p*	Cramer's V	*p*
Expected	4432	84.2	831	15.8				
Amount of Teacher Preparation								
None	132	3.0	89	10.2	140.42	<.001	.16	<.001
Some	494	11.3	163	18.7				
Extensive	3765	85.7	621	71.1				
Degree Major								
Neither	626	14.3	271	31.1	149.25	<.001	.17	<.001
General Education	395	9.0	80	9.2				
Special Education	3370	76.7	521	59.7				

Degree Level

Bachelor's or less	1950	44.4	474	54.4	28.92	<.001	.07	<.001
Master's or higher	2440	55.6	398	45.6				

Certification in Special Education

Not certified	645	14.7	190	21.8	27.44	<.001	.07	<.001
Fully certified	3745	85.3	682	78.2				

Certification in Any Subject Area

Not certified	221	5.0	92	10.6	39.57	<.001	.09	<.001
Fully certified	4169	95.0	780	89.4				

Preparation Program

No preparation	223	5.1	104	11.9	103.89	<.001	.14	<.001
Non-Traditional/Alternative	726	16.5	216	24.7				
Traditional/Degree-focused	3442	78.4	553	63.3				

Years of Teaching Experience

3 years or less	653	14.9	231	26.5	70.23	<.001	.12	<.001
More than 3 years	3737	85.1	641	73.5				

*$p<.05$, with Sidak (1967) adjustment $p<.007$

Table H4

Contingency Tables for the Qualifications of Special Educators by Teacher Assignment

Teacher Qualification	Teacher Assignment									
	Regular		Itinerant		Long-term Substitute					
	n	%	n	%	n	%	χ^2	*p*	Cramer's V	*p*
Expected	4871	92.5	309	5.9	83	1.6				
Amount of Teacher Prep										
None	200	4.1	9	2.9	12	14.5	29.36	<.001	.05	<.001
Some	622	12.8	25	8.1	9	10.8				
Extensive	4049	83.1	275	89.0	62	74.7				
Degree Major										
Neither	795	16.3	62	20.0	40	48.2	96.89	<.001	.10	<.001
General Education	411	8.4	54	17.4	10	12.0				
Special Education	3665	75.2	194	62.6	33	39.8				

Degree Level

Bachelor's or less	2281	46.8	87	28.2	56	67.5	56.37	<.001	.10	<.001
Master's or higher	2589	53.2	222	71.8	27	32.5				

Certification in Special Ed

Not certified	703	14.4	82	26.5	50	60.2	156.30	<.001	.17	<.001
Fully certified	4168	85.6	227	73.5	33	39.8				

Certification in Any Subject

Not certified	266	5.5	15	4.9	32	38.6	160.48	<.001	.18	<.001
Fully certified	4605	94.5	294	95.1	51	61.4				

Preparation Program

No preparation	271	5.6	43	13.9	13	15.5	48.53	<.001	.07	<.001
Non-Traditional/Alternative	869	17.8	57	18.4	16	19.0				
Traditional/Degree-focused	3731	76.6	210	67.7	55	65.5				

Years of Teaching Experience

3 years or less	811	16.7	28	9.1	45	54.2	96.45	<.001	.14	<.001
More than 3 years	4059	83.3	281	90.9	38	45.8				

*p<.05, with Sidak (1967) adjustment p<.007

Table H5

Contingency Tables for the Qualifications of Special Educators by School Level

| Teacher Qualification | School Level | | | | | | | | χ^2 | *p* | Cramer's V | *p* |
| | Primary | | Middle | | High | | Combined | | | | | |
	n	%	n	%	n	%	n	%				
Expected	2460	46.7	1157	22.0	1268	24.1	379	7.2				
Amount of Teacher Prep												
None	105	4.3	62	5.4	40	3.2	14	3.7	10.02	ns	ns	ns
Some	318	12.9	135	11.7	164	12.9	40	10.6				
Extensive	2037	82.8	960	83.0	1064	83.9	325	85.8				
Degree Major												
Neither	423	17.2	167	14.4	253	20.0	54	14.2	25.85	<.001	.05	<.001
General Education	250	10.2	108	9.3	90	7.1	27	7.1				
Special Education	1787	72.6	883	76.3	924	72.9	298	78.6				

Degree Level												
Bachelor's or less	1148	46.7	511	44.2	605	47.8	160	42.2	5.68	ns	ns	ns
Master's or higher	1312	53.3	645	55.8	662	52.2	219	57.8				
Cert in Special Ed												
Not certified	372	15.1	189	16.3	213	16.8	61	16.1	2.03	ns	ns	ns
Fully certified	2087	84.9	968	83.7	1055	83.2	318	83.9				
Cert in Any Subject												
Not certified	140	5.7	70	6.1	76	6.0	28	7.4	1.71	ns	ns	ns
Fully certified	2320	94.3	1087	93.9	1192	94.0	351	92.6				
Preparation Program												
No preparation	167	6.8	63	5.4	63	5.0	34	9.0	19.14	.004	.04	.004
Non-Traditional/Alt	447	18.2	226	19.5	221	17.4	48	12.7				
Traditional/Degree	1846	75.0	868	75.0	984	77.6	297	78.4				
Yrs Teaching Experience												
3 years or less	452	18.4	184	15.9	186	14.7	62	16.4	9.22	ns	ns	ns
More than 3 years	2007	81.6	972	84.1	1082	85.3	317	83.6				

*$p<.05$, with Sidak (1967) adjustment $p<.007$

Table H6

Follow-up Tests of Significance for Special Education Teacher Qualification by Gender, Age, Race/ethnicity, Teaching

Assignment, and School Level

	Gender		Age		Race/ethnicity		Teaching Assignment		School Level	
	τ	p	τ	p	τ	p	τ	p	τ	p
Preparation	.01	<.001	.01	<.001	.03	<.001	<.01	.002	ns	ns
Degree Major	.03	<.001	.01	<.001	.03	<.001	.01	<.001	<.01	<.001
Completion of grad degree	ns	ns	.02	<.001	.01	<.001	.01	<.001	ns	ns
Cert in Special Ed	.02	<.001	<.01	<.001	.01	<.001	.01	<.001	ns	ns
Cert in any area	ns	ns	.01	<.001	.01	<.001	.01	<.001	ns	ns
Preparation Program	<.01	.001	<.01	<.001	.02	<.001	.01	<.001	ns	ns
Teaching Experience	ns	ns	.06	<.001	.01	<.001	<.01	<.001	<.01	.003

*$p<.05$, with Sidak (1967) adjustment $p<.007$

Appendix I

Tables for Research Question Two

Table I1

Contingency Tables for the Qualifications of Special Educators by School Poverty Quartile

| | School Poverty Quartile | | | | | | | | | | | |
| | 1 (Low) | | 2 | | 3 | | 4 (High) | | | | | |
Teacher Qualification	n	%	n	%	n	%	n	%	χ^2	p	Cramer's V	p
Amt of Teacher Prep												
None	36	2.7	31	2.4	59	4.5	95	7.2	104.56	<.001	.14	<.001
Some	105	8.0	176	13.4	153	11.6	222	16.9				
Extensive	1176	89.3	1110	84.3	1103	83.9	997	75.9				
Degree Major												
Neither	162	12.3	195	14.8	227	17.3	313	23.8	77.97	<.001	.09	<.001
General Education	113	8.6	139	10.6	99	7.5	123	9.4				
Special Education	1042	79.1	982	74.6	989	75.2	878	66.8				

Degree Level

Bachelor's or less	573	43.5	624	47.4	604	45.9	623	47.4	5.31	ns	ns	ns
Master's or higher	743	56.5	692	52.6	711	54.1	691	52.6				

Cert in Special Ed

Not certified	180	13.7	188	14.3	195	14.8	273	20.8	32.03	<.001	.08	<.001
Fully certified	1137	86.3	1129	85.7	1120	85.2	1041	79.2				

Cert in Any Subject

Not certified	48	3.6	81	6.2	72	5.5	113	8.6	29.54	<.001	.08	<.001
Fully certified	1269	96.4	1236	93.8	1243	94.5	1201	91.4				

Preparation Program

No preparation	48	3.6	97	7.4	83	6.3	99	7.5	85.14	<.001	.09	<.001
Non-Traditional/Alt	175	13.3	203	15.4	250	19.0	312	23.7				
Traditional/Degree	1094	83.1	1016	77.2	982	74.7	903	68.7				

Yrs Teaching Experience

3 years or less	207	15.7	198	15.0	216	16.4	264	20.1	14.35	.002	.05	.002
More than 3 years	1110	84.3	1119	85.0	1099	83.6	1050	79.9				

*p<.05, with Sidak (1967) adjustment *p*<.007

Table I2

Contingency Tables for the Qualifications of Special Educators by School Urbanicity

Teacher Qualification	School Urbanicity						χ^2	*p*	Cramer's V	*p*
	Urban		Suburban		Rural					
	n	%	n	%	n	%				
Amt of Teacher Prep										
None	95	6.0	91	3.2	34	3.9	31.32	<.001	.06	<.001
Some	229	14.6	324	11.5	103	11.8				
Extensive	1249	79.4	2397	85.2	739	84.4				
Degree Major										
Neither	319	20.3	440	15.6	138	15.7	26.90	<.001	.05	<.001
General Education	140	8.9	232	8.2	103	11.7				
Special Education	1115	70.8	2141	76.1	636	72.5				
Degree Level										
Bachelor's or less	726	46.1	1257	44.7	442	50.4	8.79	ns	ns	ns
Master's or higher	848	53.9	1556	55.3	435	49.6				

Cert in Special Education									
Not certified	291	18.5	406	14.4	139	15.8	12.42	.002	.05	.002
Fully certified	1283	81.5	2407	85.6	738	84.2			
Cert in Any Subject Area									
Not certified	121	7.7	148	5.3	44	5.0	12.21	.002	.05	.002
Fully certified	1453	92.3	2664	94.7	832	95.0			
Prep Program									
No preparation	106	6.7	162	5.8	58	6.6	2.84	ns	ns	ns
Non-Traditional/Alt	271	17.2	518	18.4	152	17.4			
Traditional/Degree	1196	76.0	2133	75.8	666	76.0			
Yrs Teaching Experience									
3 years or less	276	17.5	480	17.1	128	14.6	3.75	ns	ns	ns
More than 3 years	1298	82.5	2333	82.9	748	85.4			

*p<.05, with Sidak (1967) adjustment p<.007

Appendix J

Tables for Research Question 3

Table J1

Logistic Regression Predicting Special Educators Teaching in a High Poverty School

Predictor	β	SE	Odds Ratio	*p*	Wald Statistic	95% Confidence Interval (CI)
Intercept	-1.57	.05	.21	<.01	1010.34	
Minority	1.38	.08	3.97	<.01	291.71	3.39, 4.65
No program	-.05	.14	.96	.75	.10	.72, 1.26
Alternative program	.26	.09	1.29	.01	8.02	1.08, 1.55
Little/no preparation	.31	.18	1.37	.08	3.15	.97, 1.93
Some preparation	.32	.10	1.38	<.01	9.99	1.13, 1.68
Long-term substitute	.39	.25	1.48	.12	2.38	.90, 2.43
Itinerant teacher	-.06	.15	.94	.68	.17	.71, 1.26
Novice teacher	-.04	.12	.96	.72	.13	.75, 1.22
No special education certificate	.35	.13	1.42	.01	7.74	1.11, 1.81
No certificate (any)	.72	.22	2.06	<.01	10.87	1.34, 3.16
No education major	-.10	.12	.90	.39	.75	.72, 1.14

General education major	.04	.12	1.04	.78	.08	.81, 1.32
No education major by novice	.65	.20	1.91	<.01	10.15	1.28, 2.85
No certification by novice	-1.31	.36	.27	<.01	12.94	.13, .55
No special education cert by novice	-.32	.27	.72	.24	1.40	.42, 1.24

$*p<.05$

Table J2

Logistic Regression Analysis Predicting Special Educators Teaching in an Urban School

Predictor	β	SE	Odds Ratio	*p*	Wald Statistic	95% CI
Intercept	-1.04	.04	.35	<.01	556.28	
Minority	1.35	.08	3.85	<.01	281.95	3.29, 4.51
No program	-.22	.14	.80	.12	2.45	.61, 1.06
Alternative program	-.30	.09	.75	<.01	10.18	.62, .89
Little/no preparation	-.45	.28	.64	.11	2.52	.37, 1.11
Some preparation	-.004	.11	1.00	.97	<.01	.80, 1.23
Long-term substitute	1.36	.26	3.90	<.01	28.53	2.37, 6.44
Itinerant teacher	-.43	.15	.65	<.01	8.34	.48, .87
Novice teacher	-.59	.13	.55	<.01	19.94	.43, .72
No special education certificate	.31	.12	1.36	.01	6.56	1.08, 1.72
No certificate (any)	-.36	.23	.70	.12	2.45	.44, 1.10
No education major	<.01	.11	1.00	.99	<.01	.80, 1.25

General education major	-.09	.13	.92	.50	.45	.71, 1.18
No education major by novice	-.08	.25	.92	.73	.12	.57, 1.49
General education major by novice	.60	.32	1.82	.06	3.44	.97, 3.41
No certification by novice	.99	.39	2.70	.01	6.48	1.26, 5.81
No special education cert by novice	-.83	.31	.44	.08	6.98	.24, .81
Little/ no preparation by novice	1.84	.38	6.32	<.01	23.41	3.00, 13.33
Some preparation by novice	1.34	.27	3.83	<.01	24.75	2.26, 6.50

*p<.05

Table J3

Logistic Regression Analysis Predicting Special Educators Teaching in a Rural School

Predictor	β	SE	Odds Ratio	*p*	Wald Statistic	95% CI
Intercept	-1.57	.05	.21	<.05	968.62	
Minority	-.76	.13	.47	<.01	36.72	.36, .60
No program	.21	.16	1.23	.19	1.76	.91, 1.68
Alternative program	.01	.11	1.01	.91	.01	.82, 1.24
Little/no preparation	.04	.21	1.04	.86	.03	.68, 1.58
Some preparation	.06	.13	1.07	.62	.24	.83, 1.37
Long-term substitute	-2.38	.86	.09	.01	7.61	.02, .50
Itinerant teacher	.18	.15	1.20	.22	1.50	.90, 1.60
Novice teacher	-.03	.12	.97	.78	.08	.77, 1.22
No education major	.11	.12	1.12	.34	.91	.89, 1.40
General education major	.38	.12	1.46	<.01	9.77	1.15, 1.86
Some preparation by novice	-.84	.37	.43	.02	5.21	.21, .89

*p<.05

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