ABSTRACT

KAASE, KRISTOPHER JEROME. Equal Employment Opportunity and Educational Achievement Gaps. (Under the direction of Catherine R. Zimmer.)

Despite over 30 years of awareness, intervention, and research regarding race, class, and gender differences in educational achievement, large differences still persist. These differences have a significant impact on individuals' quality of life. Research on educational achievement gaps has been largely focused on schools or families; while policy efforts to address these gaps have been focused on schools, with limited success. This study examines the broader community context in which schools and families are embedded. Specifically, this study addressed the policy question: Is relative inequality in employment opportunity in local areas related to relative inequality in educational achievement in the same areas in North Carolina? Employment opportunity was conceptualized as quality of employment and as earnings. Relative inequality was measured by comparing a race (Black or White), class (high school education or less vs. education beyond high school), and gender group to White males with parental education beyond high school. Relative inequality in Biology and English I achievement were measured at the school level and at a modified Public Use Microdata Area (PUMA) level. Relative inequality in quality of employment and earnings were measured at the modified PUMA level, and measured separately for the local area and neighboring area. This study was unique in that it a) examined the variation in employment opportunity across communities and b) examined race, class, and gender inequality as simultaneously experienced rather than as separate inequalities. Relative inequality in local earnings had a positive relationship with relative inequality in high school Biology for most Black and

White student groups. Relative inequality in local earnings had a positive relationship with relative inequality in English I for Black students. There was little support for the hypothesis that relative inequality in the local quality of employment had an effect on relative inequality in achievement. There was also little support for the effect of neighboring community employment factors on inequality in achievement. This study found reason to support policies that would reduce relative inequality in earnings in local areas as a means to reducing educational achievement gaps.

Equal Employment Opportunity and Educational Achievement Gaps

by

Kristopher Jerome Kaase

A dissertation submitted to the Graduate Faculty of
North Carolina State University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Sociology

Raleigh

2002

Approved by:

_____ _____

_____ _____

Chair of Advisory Committee

Biography

Kristopher Jerome Kaase was born in Elyria, Ohio to Robert J. Kaschalk-Kaase and Sylvia H. Kaase in January, 1966. He was fortunate to be raised by Christian parents at a time and place when having a friend of a different race was acceptable. In 1972, his family moved to a rural part of Marietta, Georgia. It was during his elementary school years that his concern for social justice began to develop. Events in the nightly news like Wounded Knee, women's liberation marches, and Vietnam protests combined with Biblical lessons all contributed to his interest in fairness, equality, and just treatment of people. When his family moved to the more suburban east Marietta in 1980, so he could go to a better high school, he became aware of how much difference where you go to school makes. The difference was most evident by the fact that the other students in his ninth grade classes had taken Algebra I in eighth grade, while he had only taken pre-Algebra because that was the highest eighth grade mathematics class at his school.

Kris left high school a year early, passing the GED. He attended Wheaton College in Illinois before transferring and completing his bachelor's degree in philosophy at West Georgia College. He married Leah D. Townsend during this time. After a brief stint working in computer support for a small, local company in Raleigh, North Carolina, Kris attended North Carolina State University eventually completing a master's degree in educational administration and supervision. His real interest was in research and he focused heavily on research methodology and statistics in pursuing a doctorate in educational administration. It was during these studies that he became acquainted in detail with the field of sociology. Kris and his wife, Leah, had their first child, Hannah,

in 1989. By the spring of 1990, the financial strain of beginning a family led him to take a break from school and accept the position of Director of Planning and Institutional Research at Charleston Southern University. By 1991, Kris and Leah had added sons Joel and Jordan to their family.

Kris returned to Raleigh, North Carolina in 1994 accepting a job at the N.C. State University Center for Urban Affairs and Community Services working on the North Carolina Department of Public Instruction's testing program and beginning his work in K-12 public education. He also returned to his doctoral studies, transferring to the sociology program, finding the discipline appealing for its deep and broad intellectual history and strength of research methodology. Equally important was the critical perspective of many of the faculty in the sociology department and the strong orientation to social justice.

In 1998, he accepted a permanent position with the Department of Public Instruction as a senior consultant in the Reporting Section of the Division of Accountability Services. In this capacity, he worked on the implementation and development of North Carolina's school accountability model known as the ABCs of Public Education. He left the Department of Public Instruction in 2001 for an opportunity to work more closely with schools at the Wake County Public School System. In October, 2002, Kris was named the Director of Student Assessment for the Mississippi Department of Education. He began his work there in December, 2002 attempting to bring his sociological knowledge and concern for social justice to bear on public education policy in Mississippi.

Acknowledgements

Nothing that we accomplish in life has been done by us as individuals alone. Rather our accomplishments are the product of individual efforts along with the support, in many forms, of others. Thus, I must gratefully acknowledge the many people without whom I could not have reached this pinnacle of education.

First, I must acknowledge my parents, not only for raising me in a loving, Christian home, stimulating my young mind, and providing for my needs, but for their sacrifice in moving so that I could attend a better high school. This event and the consequent experience of going to a high school where most students were bound for college, along with my parents' insistence that I too go to college, were undoubtedly, in many ways, the beginning of this journey. For that I am a deeply grateful. I also greatly appreciate their words of encouragement and many prayers on my behalf.

I am also thankful for my in-laws. My father-in-law, Dr. Maurice K. Townsend, inspired me with his voracious appetite for knowledge, his acumen in organizational politics, and his effective leadership. Although he unfortunately passed away in 1993 as a result of cancer, he has continued to be an example that has guided me and by which I measure myself as an administrator and leader. I am also grateful to my mother-in-law, Lucille S. Townsend (now Lucille Commander), for her belief in me and her encouragement.

There are several faculty members in the Department of Sociology and Anthropology that I must recognize. I first and foremost must thank Cathy Zimmer for her numerous contributions to this effort. First, I most likely would have never

transferred from my doctoral program in education administration to sociology without her encouragement. While my family and friends, and sometimes even I, questioned my sanity for making the switch from education to sociology, I am convinced more than ever that it was the right decision for me. Second, Cathy is an excellent teacher. Her courses challenged me more than most, but I came away from them knowing I was well-prepared. In fact, I have used much of the knowledge and skills I learned in those courses throughout the years since—perhaps the best test of both the quality of the course and the quality of the teacher. Third, I must acknowledge Cathy's continued encouragement and support throughout the more than 10 years that we have known each other. Especially noteworthy was her willingness to take over as chair of my committee after my chair retired, and her fine leadership in that capacity.

I must thank Maxine Atkinson and Barbara Risman for their encouragement and support. Maxine always had an encouraging word and a knack for finding positives in my work and turning them into challenges that motivated me to work harder. Barbara especially deserves praise for battling with the Graduate School to give me every chance of completing this degree. Without her efforts, I would not have had this chance.

Don Tomaskovic-Devey and Jeff Leiter provided invaluable sociological insights and wisdom. Their depth of knowledge challenged me think more deeply about my work not only in response to their comments but in anticipation of their review. The result was always a better piece of work.

Last, but not least, I must thank my spouse, Leah, and children, Hannah, Joel, and Jordan for their encouragement, support, and sacrifice through these many years. While I

have worked hard to maintain a balance between being a husband, father, student, and an employee, these roles cannot all be kept in balance. Pursuing a doctorate is in many ways a selfish endeavor. I deeply appreciate the sacrifices my spouse and children made putting up with a sometimes tired and stressed husband and father, allowing me to take time away from them to study and write, and letting some projects at home go undone. I also appreciate their words of encouragement, prayers, and hugs. Most of all I appreciate our growing relationships and the constant reminder that they are to me that there is more to life than academic or career pursuits.

TABLE OF CONTENTS

Page

LIST OF TABLES viii

LIST OF FIGURES x

CHAPTER 1: INTRODUCTION 1

CHAPTER 2: CONTEXTS OF EDUCATIONAL ACHIEVEMENT GAPS 6

- Families Context 6
- School Context 14
- Community Context 25
- Conceptual Model and a Theory of Action 30
- Hypotheses 40

CHAPTER 3: METHODOLOGY: MEASURING RELATIVE INEQUALITY 45

- Data 45
- Measures 49
- Analysis Strategy 55

CHAPTER 4: TESTING A THEORY OF INEQUALITY 63

- Descriptive Statistics 63
- Regression Results 71

CHAPTER 5: SUMMARY AND CONCLUSION 100

REFERENCES 115

LIST OF TABLES

Page

CHAPTER 3: METHODOLOGY: MEASURING RELATIVE INEQUALITY

1. Amount of Variance in School-Level Relative Inequality in Achievement Explained by Differences in PUMAs 56

CHAPTER 4: TESTING A THEORY OF INEQUALITY

2. Descriptive Statistics for School-Level Relative Inequality (Effect Size) in Biology and English I Achievement Compared to White Males with a Parent with More than High School Education. 64

3. Descriptive Statistics for PUMA-Level Relative Inequality (Effect Size) in Biology and English I Achievement Compared to White Males with a Parent with More than High School Education.....66

4. Descriptive Statistics for Inequality of Relative Share Index of Quality of Employment in Local and Neighboring Communities Compared to White Males with More than a High School Education.....68

5. Descriptive Statistics for Inequality of Relative Share Index of Earnings in Local and Neighboring Communities Compared to White Males with More than a High School Education.....70

6. Descriptive Statistics for Percent of Two-Parent Families with Children 18 years-old or younger and Family Poverty Rate in the Local (PUMA) Community.....71

7. Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate 72

8. Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate 76

9. Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate....80

10. Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate....83

11. Ordinary Least Squares Estimates of Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate....87

12. Ordinary Least Squares Estimates of Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate....91

13. Ordinary Least Squares Estimates of Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate....94

14. Ordinary Least Squares Estimates of Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate....97

CHAPTER 5: SUMMARY AND CONCLUSION

15. Summary of Significant of Effects PUMA-Level Relative Inequality in Earnings on School-Level and PUMA-Level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education....102

16. Summary of Significant Effects of PUMA-Level Relative Inequality in Earnings on School-Level and PUMA-Level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education....103

LIST OF FIGURES

Page

CHAPTER 2: CONTEXTS OF EDUCATIONAL ACHIEVEMENT GAPS

1. Conceptual Model and Hypothesized Relationships Between the Causes of Variation in Inequality in the Local Communities, Their Relationship to Schools and Families, and the Relationship to Race, Class, and Gender Inequalities in Educational Achievement and Outcomes.....31

2. Operational Model of the Relationship Between Inequality in the Local Employment Opportunity Structure, Inequality in the Neighboring Community Structure, and Race, Class, and Gender Inequality in Educational Achievement and Outcomes.....41

CHAPTER 3: METHODOLOGY: MEASURING RELATIVE INEQUALITY

3. Example Data and Calculations for Dependent Variable Measure Effect Size.....51

CHAPTER 1

INTRODUCTION

Despite over 30 years of awareness, intervention, and research regarding race, class, and gender differences in educational achievement and outcomes, large differences still persist. Whites have consistently had higher educational achievement in reading, mathematics, and science than American Indians, Blacks, and Hispanics; the achievement of Asians is similar to Whites (Hedges and Nowell 1999; U.S. Department of Education 1999). While the gaps in educational achievement between White and Black and Hispanic students narrowed significantly between the late 1960s and the 1980s, the rate of decrease has tapered off dramatically and actually may have increased slightly in the last decade (Hedges and Nowell 1999; Lee 2002). These gaps in achievement remain substantially large, however, taking anywhere from an estimated 30 to 75 additional years to be eliminated (Hedges and Nowell 1999). In addition, the changes in the achievement gaps have not been consistent within these racial ethnic groups. The narrowing of achievement gaps from the late 1960s to the 1980s appears to be largely due to Black and Hispanic students at the lowest levels making rapid gains relative to White students. The trend toward increasing achievement gaps in the last decade appears to be due to higher level White students increasing achievement at a faster rate than higher level Black and Hispanic students (Hedges and Nowell 1999; Lee 2002).

Students from poorer and less educated families have also consistently had lower educational achievement than students from wealthier and more educated families (U.S. Department of Education 1999). While the educational performance of boys and girls is similar in elementary and middle school, by the end of high school boys' mathematics and

science achievement are significantly higher than girls (U.S. Department of Education 1999). These race, class, and gender differences have persisted despite key court rulings (e.g., *Brown v. Board of Education*), legislation (e.g., Civil Rights Act of 1965, Head Start, Title IX), and literally thousands of research studies.

Why be concerned about these race, class, and gender differences in educational achievement and outcomes? Education has a significant impact on the quality of life of individuals. Educational achievement attained at the end of high school affects post-secondary opportunities of students. It directly affects which colleges students are able to attend. The higher a student's achievement, the greater the range of colleges that will accept that student. Also, the higher a student's achievement the greater the availability of scholarships to pay for a college education. Students who are able to attend colleges with higher achieving students receive higher earnings even after their family background is considered (James, Alsalam, Conaty, and To 1989; Loury and Garman 1995).

People with more education have better health than people with less education. More educated people are more likely to have full-time work, to have fulfilling, personally rewarding jobs, to have high income, and to have less economic hardship, all of which are associated with better health. More educated people also have a greater sense of control over their lives and their health, have more social support, are more likely to exercise, are more likely to drink moderately, and less likely to smoke, again, all of which are associated with better health (Ross and Wu 1995).

RESEARCH QUESTION

Why have these differences persisted despite over 30 years of awareness, intervention, legislation, and research? A number of different explanations from sociological, psychological, educational, economic, and other viewpoints have been offered. These explanations have generally centered on two social structures—family and school. Politically, since the publication of *A Nation at Risk* in 1983 (National Commission on Excellence in Education), schools have been criticized as failing to produce the level of student achievement necessary to produce workers competitive in a global economy. In the late 1980s and early 1990s, many educational reforms were implemented with little if any change in the trends in educational achievement. In the mid-1990s many states took a new approach to the "failure" of schools by implementing standards and accountability. These reforms generally focused on overall student achievement. A notable exception was the system of accountability implemented in Texas which held schools accountable for overall student achievement as well as the achievement of specific sub-populations (e.g., racial/ethnic groups, students receiving free/reduced lunch). The Texas accountability system served as a model for the federal *No Child Left Behind* legislation (PL 107-110). Signed into law in 2002, this legislation holds schools in every state accountable for achievement of all students and student sub-populations including racial/ethnic groups, students eligible for free/reduced lunch, students with disabilities, and students with limited English proficiency.

The focus of these reform efforts has almost exclusively been schools. Little attention has been paid, however, to the importance of the community in which a school and

family are embedded. The local community context has been shown to affect educational outcomes (Caldas and Bankston 1999; Entwisle et al. 1994; Roscigno 1996). Studies by Beck and Colclough (1988), MacLeod (1995), and Willis (1977) show that there is a relationship between the local labor market and educational achievement and outcomes. In short, these studies demonstrate that any school outcomes need to be considered in the light of the community context in which schools exist.

The motivation for this study was to demonstrate an empirical link between the larger community context within which schools are embedded and differences in educational achievement among groups of students. If an empirical link can be demonstrated, policy makers may be encouraged to consider changes in policies that change the community context within which schools are embedded and thereby contribute to changes in educational achievement and outcomes.

Generally, studies similar to this one have focused on one or two race, class, or gender groups. Black feminists, however, have brought the theoretical insight that race, class, and gender are experienced simultaneously (Collins 1991; Hooks 1984). That is, the study of race, class, or gender differences alone is not true to people's experience. This study brings together the theory on the relationship between local labor market opportunity and educational achievement and the theory on inequality into a single study to understand the inequalities in educational achievement and outcomes. The study asks is there a relationship between race, class, and gender inequality in the local employment opportunity structure and race, class, and gender inequality in educational achievement and outcomes? I expected to

find that inequality in the local labor market context has a substantial effect on inequality in educational achievement.

STRUCTURE OF THE DISSERTATION

In Chapter 2, I review the relationship between family, school, and community and inequalities in educational achievement and outcomes. While I provide an overview of the processes and mechanisms by which inequality in education is perpetuated, my main focus is on the relationship between the community context, specifically equal employment opportunity, and educational achievement. In Chapter 3, I describe the methodology used to address the research question including description of the data, measures, and analysis strategy. Chapter 4 provides descriptive statistics for the variables in the study, and the results of the regression models used to test the hypotheses. Finally, in chapter 5, I discuss and evaluate the hypotheses based on the results presented in chapter 4, and provide recommendations for future research.

CHAPTER 2

CONTEXTS OF EDUCATIONAL ACHIEVEMENT GAPS

People have tried to explain the race, class, and gender differences in educational achievement and outcomes from a variety of viewpoints. These perspectives have generally been centered around two social structures—family and school—and less often around a third social structure—the community. In this chapter, I provide an overview of some of the explanations for differences in educational achievement centered around these three social structures. First, I review the relationship between family structure and resources and differences in educational achievement. Second, I review the relationship between school processes in the classroom and organizationally and differences in educational achievement. Third, I examine the relationship between the local community and educational achievement. Finally, I provide a conceptual model and overview of the relationship between these three social structures and inequalities in educational achievement. This conceptual model leads to an explication of my operational model and hypotheses.

FAMILY CONTEXT

A number of theories have tried to explain differences in educational achievement based on family structure and family resources. Some studies have directly addressed differences in race, class, and gender, while other studies have only indirectly addressed these differences. First, I examine explanations based on family structure including birth order, number of siblings, and single-parent vs. two-parent families. Then I examine explanations based on material and non-material family resources.

Family Structure

Studies have generally shown that the larger the family, the lower children's educational achievement and outcomes such as verbal ability, staying in high school, and attending college (Alwin 1991; Blake 1989; Steelman 1985). This finding has been used to explain why groups which tend to have more children per family—particularly Blacks, Hispanics, the poor—have lower educational achievement and outcomes. One explanation for this effect is that as the number of family members increases, through the birth of children, the proportion of mature intellectual people decreases and therefore the family intellectual environment decreases. The more children who are born the lower the intellectual climate and therefore the lower the intelligence of the later-born children (Zajonc 1975). Other studies, however, have found that much more important are parents' years of schooling and the individual's years of schooling (Alwin 1991; Powell and Steelman 1993). These effects are somewhat different for Blacks and Whites, indicating that racism may have effects apart from the effects of number of siblings, parents' and individual years of schooling.

Another aspect of family structure, having one or two parents in the household is also thought to be important in determining educational achievement and outcomes. The theory is that children living with two parents are provided more material and non-material resources from which children benefit. Coming from a two-parent family has generally been shown to have a positive effect on educational outcomes and achievement, and occupation, although there can be differences between two-parent and parent-stepparent families with the later having somewhat lower achievement and outcomes than the former (Astone and McLanahan 1991; Biblarz and Raftery 1993; Caldas and Bankston 1999). The negative effect of coming

from a single-parent family is not the same across class however. For children from higher income households, the greater the proportion of time they spent in a female-headed household between ages 11-16, the less likely they were to graduate from high school and the fewer years of schooling they completed. Yet for children from lower income households there was no difference in likelihood of graduating from high school or in years of schooling completed when comparing children from two-parent and female-headed households (Hofferth et al. 1998). Inasmuch as income is an indicator of class, children from higher class familes are hurt more by coming from a single-parent family than children from lower class families. This may indicate that at lower class levels difference between single-parent and two-parent families on key parental practices such as monitoring schoolwork and supervision (Astone and McLanahan 1991) are minimal, whereas differences on these practices between single-parent and two-parent families at higher class level may be much larger.

Family Resources

Family income, one measure of social class, has a positive association with a wide variety of educational outcomes throughout a student's school experience (Duncan et al. 1998; Entwisle and Alexander 1992; Walters and Biggs 1993). The importance of family resources is also evident in that negative effects of the number of siblings and proportion of closely spaced siblings on educational achievement and outcomes are greatly reduced when family resources are taken into account (Downey 1995; Powell and Steelman 1993).

While economic resources in the form of family income has been shown to be a major factor in educational outcomes, more recent research has focused on the significance

of wealth versus income. This distinction has been brought to light by the observation that the children of Black parents who earn the same income as White parents still do not fair as well in educational achievement and outcomes (Conley 1999; Oliver and Shapiro 1995).

Conley (1999) found that wealth, but not income, was significant in predicting a number of outcomes. Specifically, he found that parents' liquid assets (i.e., cash, stocks, bonds) were significant in reducing the likelihood of being held back a grade or being suspended or expelled. Likewise, parents' liquid assets were significant in increasing the likelihood of completing high school or college. Interestingly, living in a female-headed household does not have any effect on any of these outcomes when wealth is considered. The same is true of the number of siblings, except in the case of completing college where it has a negative effect.

Conley (1999) also found that Blacks were less likely to be held back a grade and were more likely to graduate high school than Whites when wealth was controlled. Females were advantaged on four outcomes: they were less likely to be held back a grade, suspended or expelled; and more likely to graduate from high school and college. Hofferth et al. (1998) found more specifically that Black females were more likely to complete high school than White males whether their family had high or low income. Also, only Black females from low income families were more likely to complete college than White males. Similarly, Black females from low income families completed more years of schooling overall than White males, but Black females from high income families completed less school overall compared to White males. White females and Black males were not different from White males on any of these outcomes.

Wealth may provide advantages, but lack of wealth may create disadvantages. Persistent poverty has a direct effect on internalized mental health problems, such as anxiety or depression, regardless of race or even if the person is currently in poverty. Even short-term poverty can have an effect on externalizing behaviors such as disobedience, bullying, and temper (McLeod and Shanahan 1993). Obviously, these internalized or externalized problems resulting from poverty can have a significant effect on students' educational achievement and outcomes by either directly affecting the student or the parents.

While wealth may provide financial advantages, it likely provides other social class advantages. One such resource is cultural capital. Cultural capital is the cultural skills and knowledge to negotiate everyday interactions with others that children most often learn from their parents by example and by direct teaching (Bourdieu 1977). The rub is that cultural capital is not valued equally, particularly not in schools which are dominated by middle and upper class Whites. Thus,

> Students with more (and the correct) endowments of cultural capital—students from families with the skills and preferences of the dominant culture—are better able to decode the implicit "rules of the game," are able to adapt and further develop the cultural skills and preferences rewarded in schools, and hence are better able to negotiate their way through the highest educational levels. Social inequalities perpetuated as initial differences in cultural capital become systematically encoded in educational credentials, which then funnel individuals (or rather reproduce individuals) into social class

> positions similar to their parents (Aschaffenburg and Maas 1997, p. 573).

Cultural capital is then just one way in which social class advantages some students and disadvantages others, and facilitates students' educational achievement and outcomes that are consistent with their social class.

Parenting style has been viewed by psychologists as a family resource that is related to educational achievement. Generally, parenting styles have been grouped into three types: authoritarian, permissive, and authoritative. Authoritarian parenting is characterized as high demand of children by parents and low responsiveness by parents to children. Permissive parenting is characterized by few demands by parents, tolerance and acceptance of children's impulses, and child self-regulation rather than parental regulation. Authoritative parenting is characterized by clear rule setting, consistent enforcement and regulation, high expectations of children, open communication between parent and child, and encouragement of independence by children. In general, authoritative parenting is associated with higher educational achievement for both boys and girls from lower, middle, or upper class backgrounds (Dornbusch et al. 1987; Lamborn et al. 1991; Steinberg et al. 1992). This pattern is not consistent across race, however. The positive association between authoritative parenting and educational achievement is strongest for Whites followed by Hispanics. Asian students have the highest educational achievement on average, but their parents are the least authoritative. For Blacks, no parenting style has positive or negative association with educational achievement (Dornbusch et al. 1987; Steinberg et al. 1992; Steinberg et al. 1994).

These confounding results indicate that race is more salient than parenting style. Black youth have been known to reject education because success in education is viewed as being successful in the "White world" and can only be achieved by "acting White" (Fordham and Ogbu 1986). Indeed, there are racial differences in the perceived benefits of education. While all students of all races believe that success in education has benefits, there are differences in the perceived harm of educational failure. Asian students have a much stronger fear that educational failure will have negative consequences than Black or Hispanic students (Steinberg et al. 1992). It would be easy to engage in "blaming the victim" by suggesting that Blacks and Hispanics need to have a greater fear for the negative consequences of educational failure. However, it is more likely that their lower fear of educational failure is rooted in their accurate observation that education makes little difference in keeping Blacks from falling into poverty (Roscigno 1996).

In this section I examined explanations for how the context of an individual's family might effect educational achievement and outcomes. I found that to the extent that family context had an effect on students' educational achievement and outcomes, it was dependent on the class and race of the student's family. Students from higher social classes (as measured by income and wealth) were more likely to complete high school and college and less likely to be held back a grade or suspended/expelled. Coming from a high social class family provides a student with a number of resources which facilitate the student's reaching higher educational achievement and outcomes. Money is just one resource. Money makes a difference in opportunity to attend college, but also may provide other opportunities such as tutoring or educational opportunities outside of school. Lack of money, that is poverty, can

also have negative consequences on behavior and mental health of both parents and students, which can then have a detrimental impact on educational achievement and outcomes. Cultural capital is another resource provided by social class. The cultural capital of the higher social classes is privileged over the cultural capital of other classes. There are likely many other mechanisms by which coming from a high social class family facilitates success in educational achievement and outcomes.

The race of one's family also appears to influence educational achievement and outcomes. Somewhat surprisingly, once social class is considered, Black students are more likely to complete high school than Whites. This may reflect a belief on the part of Blacks that success in education will lead to corresponding benefits in employment, income, and other areas. There does appear, however, to be an interaction by race and gender. Black females from low and high income families were more likely to complete high school and Black females from low income families were more likely to complete college than White males; there was no difference between White females, Black males, and White males (Hofferth et al. 1998). The greater success of low income Black females may reflect the fact that Black females have had greater success in employment and earnings than Black males over the last 25 years (Cotter et al. 1999), and therefore can expect better returns on their investment in education. Conversely, Black males' lower level of educational success relative to Black females may reflect the lower return on their investment in education.

What is not clear from the studies reviewed here is the impact of gender structure within the family on students', particularly female students', educational achievement and outcomes. Gender structure of the family was not considered in any of the research reviewed

here. Given that parents' gender expectations and interactions affect the gender views of children (Risman 1998), I would expect that family gender structure might have a significant impact on educational achievement and outcomes via attitudes and values of family members. For example, parents with a more traditional perspective may not encourage female children to pursue achievement in areas where there are higher financial rewards (e.g., mathematics and sciences) relative to male children because they may not value such a career-orientation for them. More feminist or egalitarian-oriented parents might provide greater encouragement for female children in these areas or seek out additional opportunities to support achievement in these areas so that they will have the option to pursue careers in mathematics or science.

The research presented here while not exhaustive does illustrate that class and race context of the family are significant in determining the educational achievement and outcomes of the children. Now I examine race, class, and gender in the context of schools.

SCHOOL CONTEXT

Schools are an obvious object of research when trying to explain racial, class, and gender differences in educational achievement and outcomes. Like studies of families, some studies of schools have directly addressed differences in race, class, and gender, while other studies have only indirectly addressed these differences. Much of this research has focused on classroom and teacher characteristics and interactions. Other studies have focused more on the organization of schools and how that organization facilitates or does not facilitate differences in race, class, and gender.

Classroom Effects

Teacher and student interactions are affected by race, class, and gender. Teacher judgments about student competence and abilities are influenced by distinctions in appearance, mannerisms, and classroom social behavior (Rist 1970). Research has found that elementary school teachers tend to treat students from low socio-economic (i.e., lower class) backgrounds less favorably than students from high socio-economic backgrounds (Alexander, Entwisle, and Thompson 1987). Students who display appearance, mannerisms, and classroom social behaviors that are more highly valued by teachers, and therefore judged as correct, will elicit a more favorable judgment, as reflected in grading, from teachers (Farkas 1996). As mentioned earlier, children's appearance, mannerisms, and classroom social behavior will depend to a large extent on the cultural capital students receive at home.

These teacher judgments influence educational achievement and outcomes. Teacher judgments of student skills and school habits affect students' achievement as measured by course mastery and course content (Farkas 1996). Teacher judgments based on appearance, mannerisms, and social behavior—and therefore on social class and cultural capital—affect grouping of students by ability for instruction (Thorne 1993). If students are placed in ability groups based on social class rather than actual ability, students placed in ability groups that are lower than their actual ability will be restricted in their opportunity to learn, and therefore, limited in their achievement. Such placements can have cumulative effects over the course of a student's school career (Kerckhoff and Glennie 1999).

Gender is a much more visible basis for teacher grouping of students in elementary school (Thorne 1993). Differences based on gender/bodily differences are made as early as

preschool (Martin 1998). Race, class, and gender are also part of students' interactions with each other. Gender distinctions are most visible and therefore emphasized more than class and race distinctions. Distinction based on gender is so powerful for students, that elementary school males use gender to convey race and class differences and subordination—e.g., forcing boys of a particular race and class to "sit with the girls" (Thorne 1993). Distinguishing children by gender, in overt and subtle ways, gives children the message that differences in gender are relevant to their learning. Such messages might, for example, contribute to girls viewing English/language arts more favorably than boys in middle school which later carries over into high school (Catsambis et al. 1999; Kubitschek and Hallinan 1996).

Teacher feedback to students is different by race and gender (Irvine 1990). Irvine and her associates observed 63 classrooms in 10 K-5 schools in three rural school districts and one urban/suburban school district in the southeastern U.S. The teachers observed were predominately white (92%) and in language arts classes (76%). White females received the least teacher feedback in both lower (grades K-2) and upper (grades 3-5) elementary. In upper elementary grades teacher feedback to Black females was approximately the same as White females, and lower than feedback to Black females in lower elementary. Upper elementary Black females were given less total teacher feedback, less positive feedback, and fewer public response opportunities. Upper elementary Black and White females received less academic feedback than Black and White males.

Male students initiated more positive and negative interactions with teachers and received more academic and non-academic feedback from teachers (Irvine 1990). Blair

(2000) found eighth grade boys in language arts class spoke first and loudest, interrupted the most, made side comments to classmates, or mocked previous ideas.

These patterns seem to indicate that early in school White females are socialized into a subordinate role and that by the end of elementary school Black females have been socialized into the same subordinate role as White females. The finding that females in middle school in general have lower self-esteem than males (Catsambis et al. 1999) may indicate that females accurately perceive this social closure from the education process. Thus, females may not only experience social closure in their interactions with teachers and male students, but they also pay at the individual level psychologically with lower self-esteem. The contrasting behavior of males, along with the fact that they initiate more interaction with and receive more feedback from teachers, is consistent with males being treated as superior by their teachers and with males acting on their superior status by taking control of the "public space" in the classroom. Blair noted females mostly took advantage of pair and small group talk, which is consistent with females being closed out of the "public space" by males and by teachers treating males as superior. Blair noted that a few males monopolized the "public space" and that other males behaved more like females with private conversations. Blair did not note if this pattern was related to race or class. Although only a few males dominated the "public space" that did not prevent other males from being a part of that domination when they chose to be.

Teacher interactions with parents are also affected by race and class. Teachers generally expect trust, deference, partnership, and cooperation. These "rules of the game" are difficult for Black parents to play by because of past discrimination. They cannot trust

that their children will be treated fairly (Lareau and Horvat 1999). Based on the findings presented above they are justified in their concern that their children are not treated fairly. Black parents are treated differently by teachers regardless of class. For example, middle and upper class parents typically display a sense of entitlement to interact with teachers as equals. Teachers tend to be receptive of this expectation and to reciprocate with White, middle and upper class parents, but teachers are much less receptive of this expectation with Black, middle and upper class parents (Lareau and Horvat 1999). The difference in the ways that teachers interact with White versus Black parents likely means, as research has found, that parental involvement on the part of Blacks will be less effective in improving Black students' achievement (Desimone 1999).

Tracking/Ability Grouping

One of the most often cited reasons for differences in educational achievement and outcomes is the placement of students into different curricular courses of study (tracks) or ability groups. As mentioned above, this practice occurs in the classroom in the elementary school. The focus of research on tracking and ability grouping, however, has been on school-wide organizational practices which occur more explicitly in high schools. For an interesting study of the effect of achievement-based grouping on reading and mathematics achievement at the elementary school classroom level, see Leiter (1983).

Track enrollment is a significant determinant of opportunities to learn and achievement in high schools (Kilgore 1991). Students placed in higher level academic tracks are exposed to higher level knowledge and skills (e.g., calculus). Students placed in lower

level academic tracks generally will not have the opportunity to be exposed to the same knowledge and skills that students in higher level tracks will.

On the face of it, placing students into different tracks seems logical, since not every student will be able to master the highest levels of knowledge and skills. The problem is that students are not arbitrarily placed in tracks, nor are they placed in tracks simply based on achievement (Kilgore 1991). High school students from higher socioeconomic status (social class) backgrounds are more likely to be in an academic track even when student characteristics (grades, ability) and school organizational characteristics (electivity, inclusiveness, and school socioeconomic status) are the same (Jones et al. 1995).

Gender and social class are significant in determining initial high school English placement. In Kubitschek and Hallinan's (1996) study of high school placement, females not on free/reduced lunch (i.e., middle class and above) were more likely to be initially placed in a higher level English course compared to males with identical test scores and grades. The advantage was small for females in the lowest eighth grade English track placement, but increased significantly with each higher eighth grade English track placement. For females on free/reduced lunch the pattern was quite different. Males who were in basic English in eighth grade were more likely to be initially placed in a higher level English course than comparable females. Males and females who were in regular English in eighth grade were about equally likely to be initially placed in a higher level English course. Females who were in honors English in eighth grade were more likely to be initially placed in a higher level English course than comparable males. Thus, middle class and higher (i.e., not on free/reduced lunch) females in regular and honors eighth grade English were the most

advantaged, followed by poor females in honors eighth grade English, followed by males, and finally with poor females in basic eighth grade English being the most disadvantaged.

Gender, race, and social class are significant in determining initial high school mathematics placement. White males not on free/reduced lunch (i.e., middle class and above) followed by White males receiving free/reduced lunch (i.e., poor) were most likely to be initially placed in a higher level high school mathematics course than other students with comparable test scores and grades. White females and Black males had a similar likelihood of being initially placed in a higher level mathematics course; the likelihood for both White females and Black males decreased similarly if they were poor. Black females were the least likely to be initially placed in a higher level mathematics course (Kubitschek and Hallinan 1996).

Gender, race, and social class are also significant in initial placement in middle school. Blacks are less likely to be placed in advanced English than Whites with comparable test scores, grades, and family background. In contrast to initial high school English placement there is no advantage for females or for students not on free/reduced lunch. Blacks are less likely to be placed in advanced mathematics and are more likely to be placed in remedial mathematics than Whites with comparable test scores and grades. Students not on free/reduced lunch (i.e., middle class and above) are advantaged further. In contrast to initial high school mathematics placement White females, rather than White males, have a greater likelihood of being placed in an advanced mathematics course (Dauber et al. 1996).

Even if high school students were placed in tracks simply based on achievement, I have presented evidence above that this achievement is itself a function of race, class, and

gender. Thus placement on seemingly meritocratic grounds as achievement would still be placement based on race, class, and gender. Even without considering prior effects of race, class, and gender discrimination on achievement, track placement is a function of race, class, and gender discrimination in the school.

The social class context of the school is also an important factor in track placement. The more students with high socioeconomic status (class) backgrounds in the school, the more likely these same students are in an academic track than a general track, and the more likely they are in a general track than a vocational track. Likewise, the more students with low socioeconomic status (class) backgrounds in the school, the more likely these same students are on a vocational track (Jones et al. 1995).

Organizational differences in schools affect how much difference there is in opportunity to learn for students placed in different tracks or ability groups. Schools that allow more mobility between tracks have smaller gaps in mathematics achievement between students in academic and non-academic tracks, and they have overall higher mathematics achievement. Schools that have more inclusive tracking, that is, allowing more students into academic tracks than expected based on their prior achievement, have higher overall mathematics and verbal achievement (Gamoran 1992). However, schools with more students with high socioeconomic (class) backgrounds in the school, the more pressure there is for exclusive tracking (Kilgore 1991). These findings could be interpreted as evidence that there is pressure from higher class parents to maintain their dominant position by excluding the children of lower class parents from the curricular tracks that lead to higher educational

achievement and outcomes. Thus schools become the instrument of social closure for the higher classes.

Schools with restructuring practices had a positive effect on student academic engagement and achievement gains from grade 8 to grade 10 in reading, mathematics, history, and science, and they had less difference in achievement between students from different socioeconomic status (class) backgrounds. Restructuring practices include having mixed ability classes, interdisciplinary teaching, cooperative learning focus, more mobility, and more inclusive tracking. These organizational characteristics of schools are not distributed randomly, however. Schools with restructuring practices generally had higher socioeconomic (class) students, fewer minorities, and were smaller in size than schools with no restructuring practices (Lee and Smith 1995). Like tracking practices, restructuring practices appear to be implemented where the White higher classes are the majority, and where therefore, few lower class and minority students will pose a threat to their dominant position in the school structure.

In this section I examined explanations for how school context might affect student achievement and outcomes. I found that race, class, and gender structure schools. In elementary school gender appears to be the primary organizing structure in teachers' interactions with students, and with students' interactions with each other. Males appear to be treated preferentially and they appear to assert their dominance in the public space of the elementary school. White females in elementary school have the least interaction, positive or negative, with teachers and are joined in this distinction (or lack thereof) by Black females in the upper elementary grades. Thus, early in their school career, females are being socialized

to a subordinate position. This trend appears to continue into middle school, and females pay for their subordination with the psychological cost of lower self-esteem.

Teacher interactions with parents are affected by race and class. Poor, Black, and Hispanic parents are at a disadvantage in interacting with teachers as peers. This difference has real consequences in that White and middle and upper class students benefit from their parents' involvement and interaction with their teachers whereas poor, Black, and Hispanic students do not get the same level of benefit from their parents' involvement.

In this section I also examined a major organizational feature of schools—curricular tracks. I found that race, class, and gender played a part in determining the track placement of students in elementary, middle, and high school. In general, middle and upper class students, Whites, females in English, and males in mathematics were advantaged over other students. The patterns presented, however, were complex enough to indicate that no single structure—that is, race, class, or gender alone—provides an advantage or disadvantage. Rather, students are advantaged or disadvantaged based on a combination of their race, class, and gender, which varies by subject in the two broad areas of English and mathematics.

Finally, I found that the organizational practices schools choose related to tracking and restructuring practices were organized by class interests. The higher the proportion of students from higher class families in the school, the more likely students are put in curricular tracks that lead to higher achievement and outcomes, and the more likely those tracks will be exclusive and consequently close out students from lower class families. Similarly, restructuring practices that lead to higher achievement are most likely to be implemented in schools dominated by students from higher socioeconomic class families.

One shortcoming of the educational research literature has been the tendency to focus on families or schools in explaining differences in educational achievement. This tendency is with good reason: social processes are extremely complex and it is difficult, if not intimidating, from both a theoretical and practical point of view to try to fully address the complexity of the social processes that result in differences in educational achievement and outcomes. A consequence of this practice is that there is little integration of theory, which sometimes leads to fragmented and confusing findings.

One response to this fragmentation has been the development of theories that embrace the larger community within which students, families, and schools are embedded to explain educational achievement and outcomes. These theories examine the influence of economic, political, and social processes and structures outside family and school and their effect on students not only through their effect on family and school, but also on students directly. I characterize these theories as examining the contextual effects of the community for two reasons: 1) community is the next broader level of social space that encompasses both families and schools; and 2) these theories have tended to focus on effects tied to particular spatial areas such as counties or metropolitan areas. In some research these theories are referred to as "local opportunity structure" theorizing. In other research they are referred to as "institutional context" theories. Whatever the term, what these theories have in common is the examination of economic, political, or social structures at a local level—whether that local level is the neighborhood, the county, or the state—and their impact on various outcomes. It is this theory to which I turn in the next section.

COMMUNITY CONTEXT

Many studies overlook the fact that students, families, and schools are embedded within and are affected by a broader community. In recent years, however, a growing number of researchers have incorporated the influence of community economic, political, and social processes and structures into theory. A few researchers have addressed the effects of these local political, economic, or social structures directly in their research on educational achievement and outcomes. Other studies demonstrate the impact of community context on other outcomes such as economic opportunity, residential segregation, adolescent delinquency, and premarital birth which also impact educational achievement and outcomes.

One area of theorizing has been the effect of community socioeconomic structure. Entwisle et al. (1994) theorized that neighborhood social class level has an impact on mathematics achievement of elementary school children. They found that lower elementary school males from higher income neighborhoods had higher mathematics achievement than females even after taking into consideration the individual students' parents' income and education. The higher the neighborhood income level the greater the difference between males and females. The results were the same for neighborhood parental education level except that the difference between males and females was even greater than that based on neighborhood income level. Thus, the higher the class level of the neighborhood, as measured by income and parental education, the higher the mathematics achievement of lower elementary males relative to females. Entwisle et al. speculated that this neighborhood effect was due in part to males in more affluent neighborhoods having greater exposure to the neighborhood environment (e.g., playing outside, interacting with other children and adults,

exploring) and independence that foster development of problem-solving and mathematics skills.

The class structure of the community impacts the achievement of high school students as well. The local family poverty rate, an indication of the socioeconomic class level of the community, has a negative effect on mathematics and reading achievement of tenth graders. While this effect disappears once family income is taken into account, the local family poverty rate has an indirect effect through other class measures—family income and parental education. The higher the local family poverty rate the lower family income and parental education, and consequently the lower reading and mathematics achievement (Roscigno 1996).

The community racial structure has also been theorized to have an effect on educational achievement and outcomes. Local racial (Black/White) inequality has a negative effect on mathematics and reading achievement of tenth graders. As local racial inequality increases, the advantage to Whites in reading and mathematics achievement increases and the *dis*advantage to Blacks increases. This holds true even after family income and local family poverty are taken into consideration. While these effects are mediated through family and school, they are not completely explained by family and school factors. Local racial inequality affects family income, which in turn increases the advantage of Whites and increases the disadvantage of Blacks. Local racial inequality also increases the likelihood of living in a single-parent or other non-traditional household, which lowers achievement and other educational outcomes (Roscigno 1996).

Caldas and Bankston (1999) theorized that the family structure of the community affects educational achievement. They found that the higher the percentage of students with single parents in a school, the lower the school-level achievement on a tenth grade graduation test. The percentage of students with single parents in a school had a negative impact on individual student achievement, even when the student had a two-parent family, and it further depressed the achievement of students in the school with a single parent.

While these studies represent efforts to theorize effects outside family and school, they look at *aggregate effects of inequality rather than causes*. That is, they take individual conditions such as poverty status or family structure and aggregate them to a higher level. While such aggregation begins to get at the conditions above and beyond family and school, they still do not begin to get at *causes* of these conditions. For example, Caldas and Bankston (1999) document the effect of the percentage of students with single parents on individual and school achievement, yet they never discuss what would cause the percent of single-parent families to vary across schools, or what impact this cause might have *in addition* to affecting the number of single-parent families.

There is a body of research that does address causes of these conditions at the community level. Historically the Marxist perspective, whether from a capitalist exploitation (Cox 1948; Reich 1971) or a split labor market perspective (Bonacich 1972), has been the main proponent of the view that class and racial inequalities are rooted in the capitalist economic system. There have been numerous studies that tested this theory and have shown that there is a link between local economic conditions, both contemporarily and historically,

and class and racial inequality (e.g., Tolbert, Horan and Beck 1980; Tomaskovic-Devey 1991; Tomaskovic-Devey and Roscigno 1996; Wilson 1987).

At the same time, the Marxist position that it is class divisions, and therefore class inequality, that drives racial and gender inequality has been contested by both social historians and by feminists. From the socio-historical perspetive, race has been and is a social construction in which both the upper and lower classes have participated. As such, race is a basis of stratification in its own right (Allen 1994; Omi and Winant 1996; Roediger 1999). Feminists too have asserted the standing of gender as a means of organizing society that is independent of class and race. Black feminists (e.g., Collins 1991, Hooks 1984), however, have brought to this debate the perspective that neither gender, nor class, nor race is more fundamental. From their perspective, it is not a matter of which inequality is more fundamental but a matter of "both/and;" that is, *racial, class, and gender inequalities exist, and people experience them, simultaneously*. Along with this perspective was the idea that there are few pure victims or exploiters of inequality because of the overlapping nature of race, class, and gender inequalities. Instead people are often in the social position of being both oppressor and oppressed.

Regardless of the debates within and among Marxists, social historians, and feminists, there is a point of consensus: *inequalities are realized in the local labor market*. Racial and gender inequalities in the labor market are well documented (Cotter et al. 1999; Reskin and Padavic 1994). And these differences vary across communities (Beggs 1995; Cotter et al. 1999). This is not to say that the political, ideological, economic, and social causes of these inequalities are not important. They are important because the contemporary circumstance of

each community is a result of its political, ideological, economic, and social history. A comprehensive analysis of any community would examine the role each of these played in shaping a community's contemporary situation. The focus of my attention, however, is the spatial variation in the contemporary circumstance of communities and the persistence of race, class, and gender differences in educational achievement and outcomes.

Educational outcomes are linked to contemporary local labor market conditions. For example, Beck and Colclough (1988) found that returns on the value of education were in part a function of the organization of the local economy, the race and gender of the available labor, and the education level of labor. They also found that for Blacks and White females the returns to education were more dependent on the local labor market than the returns to education for White males. Willis' (1977) study of sons of White, working-class families in England reveals how students may react to the local employment opportunity structure. In this study, these boys reject school culture and its definition of success because they see little value for it in the world that awaits them when they complete school. MacLeod (1995) found a similar reaction on the part of White inner city youth. What these studies show, especially Willis' and MacLeod's, is that high school age youth, at least, are very cognizant of the local employment opportunity structure and what prospects for future employment it holds for them. The local employment opportunity structure, while not determinative, does provide a reference point that students then use to make decisions about schooling, its value, and how much they are willing to seek what is defined as success within school.

The local labor market inequality, or more appropriately the local employment opportunity, is itself dependent on a number of local factors. The type of industry in the

community, the power of labor relative to employers, the relative concentration of minority racial groups (particularly Blacks) in a local community as well as in neighboring communities, and social support for equality have all been shown to affect local labor market inequality (Beggs 1995; Beggs et al. 1997; Parcel 1979; Tomaskovic-Devey 1987; Tomaskovic-Devey and Roscigno 1996). One might argue that differences in the local labor market reflect differences in choices (e.g., women preferring to work in female dominated jobs) or differences in educational preparation or experience (i.e., human capital). Tomaskovic-Devey (1993) has illustrated that racial and gender differences in job characteristics are less due to differences in human capital than due to employers placing Blacks and women into less skilled jobs than comparably skilled White males. This placement is not by choice on the part of employees. Also counter to the human capital argument, Thomas (1993, 1995) found that Blacks with more education (i.e., human capital) and in professional occupations were actually more disadvantaged than Blacks with less education and in non-professional occupations in relative earnings of similarly situated Whites.

CONCEPTUAL MODEL AND A THEORY OF ACTION

Thus far I have reviewed some of the most proximate causes of race, class, and gender inequality in educational achievement as well as some more distant causes. A conceptual model indicating the hypothesized relationships among these causes are illustrated in Figure 1. Family and school are hypothesized to be the most proximate or immediate causes of race, class, and gender differences in educational achievement and outcomes. Family and school

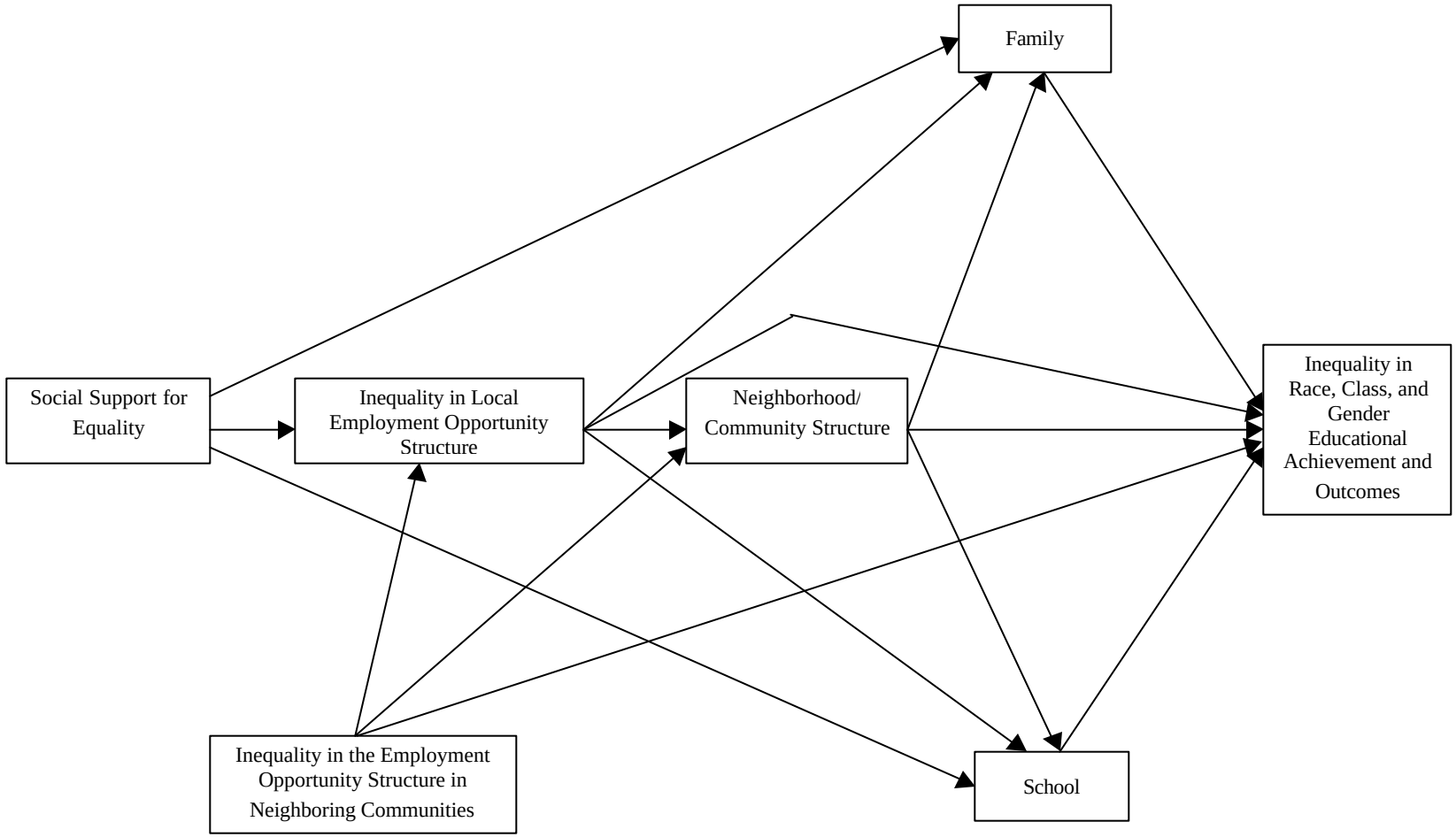

Figure 1. Conceptual Model and Hypothesized Relationships Between the Causes of Variation in Inequality in Local Communities, Their Relationship to Schools and Families, and the Relationship to Race, Class, and Gender Inequalities in Educational Achievement and Outcomes.

are in turn affected by the community context which I have conceptualized as having three distinct parts.

One part of the community context is the condition of the the local community in which the student, family, and school reside. I label this the neighborhood/community structure and it represents that there are aggregate effects of people living in a community. This level is illustrated by Entwisle et al.'s (1994) finding that the higher social class level of the neighborhood the higher the mathematics achievement of early elementary males relative to females, which indicates that neighborhood/community structure may have a direct impact on differences in educational achievement. The neighborhood/community structure captures indirect effects on educational achievement as well. For example, the higher the community rate of unemployment the more likely students are to be involved with fighting or drug use (Bellair and Roscigno 2000). Also, the higher the neighborhood socioeconomic status the higher are childhood IQs, and the lower the rates of adolescent pregnancy and leaving school, even after taking family socioeconomic status into account. White adolescents, however, benefit more from living in a neighborhood with higher socioeconomic status than Black adolescents (Brooks-Gunn et al. 1993). And Black female adolescents living in a highly segregated neighborhood are more likely to become pregnant than those living in more racially integrated neighborhoods (Sucoff and Upchurch 1998). These outcomes—fighting, drug use, adolescent pregnancy—which are affected by the neighborhood/community structure have strong potential effects on educational achievement.

A second part of the community context is the employment opportunity structure. The employment opportunity structure not only represents the types of jobs and occupations

that are available in a community, but also the relative equality of those opportunities based on race, class, and gender. The local labor market has a direct effect on educational achievement. It also has indirect effects. The employment opportunities available, and the differences in those opportunities by race, class, and gender, within a community affect the community levels of unemployment and poverty, individual family incomes, the amount of taxes available to support schools and other social supports, and the quality of labor to work in schools to name a few ways in which the local employment opportunity structure indirectly impacts educational achievement.

Equal employment opportunity in one community likely has an impact on equal employment opportunity in a neighboring or adjacent community. While students attending public schools cannot cross school district boundaries, people working in the labor market can. One way the equal employment opportunity in neighboring communities may affect the local community is by people traveling or moving to a neighboring community if employers in a neighboring community offer better wages, benefits, or opportunities. If enough people make this choice, it will affect the local community. A second way in which the equal employment opportunity in neighboring communities may affect the local community is by employers in the local community adopting employment practices similar to the neighboring communities so as to retain an adequate labor market. Beggs et al. (1997) found such an effect. They found that the concentration of Blacks in adjacent labor market areas did have a negative impact on local occupational equality for men, and occupational and wage equality for women.

The third part of the community context I have labeled the social support for equality. While the social support for equality largely represents the ideological support for equality it also represents expressions of this ideology in the form of laws, resources to enforce such laws, and voting behavior. Beggs (1995) also includes the influence of one organization over another because of normative obligations. For example, when a private sector employer must work closely with a government regulatory agency, the private sector employer may develop business practices that are similar to or viewed favorably by the regulatory agency because it is the "norm" or what is expected within the government agencies. Specifically, one practice the private sector employer might adopt is greater sensitivity to equal employment issues as is required within government agencies. Obviously such a broad ideological concept as social support will have direct and indirect impact on all facets of a community.

There are numerous mechanisms by which these parts of the community context are linked to each other and to family, school, and finally differences in educational outcomes for race, class, and gender groups. There is a fairly strong body of evidence that social support for equality is driven in part by the characteristics of the population, and specifically by the proportion of the population that is Black. Better known as competition theory, many studies have found that as the Black proportion of the population increases, racial antagonism and discrimination against Blacks increases (Blalock 1967; Lieberson 1980; Taylor 1998; Tienda and Lii 1987).[1] Basically, Whites feel threatened as the proportion of the Black population increases and consequently has a negative effect on Whites' support of racial integration

[1] Interestingly, Taylor (1998) did not find that prejudice towards Asians and Latinos increased as they increased as a percentage of the population.

(Fossett and Kiecolt 1989). This suggests that in areas where the proportion of the population that is Black is increasing or high, the social support for equality is likely to be lower. Lower support for equality should translate into greater inequality between Blacks and Whites in employment as well as in other areas.

Social support for equality is also likely shaped by the structure of industry in the area. Beggs (1995) found varying support for the effects of the presence of federal employees, how "public" an industry was, and the occupational structure of the industry. He found that the more federal sector employees there were in an industry the less relative inequality there was between White males and Black males, Black females, and White females. As described above, Beggs described this as a normative obligation effect. Because federal government hiring and employment procedures and practices are structured to provide a high level of equal employment opportunity, industries seeking to maintain favorable relations with their federal government counterparts are likely to have similar employment practices. Thus, in industries or areas in which the proportion of the industries that are "federally influenced" is higher, the more likely there is support for, and in practice, equality in employment.

Beggs found a similar effect for industries that were more "public" as measured by the percent of output spent on advertising and how dependent the industry was on the public for its product. Again, there is likely to be more equality in industries or areas dominated by such industries because they would presumably be more sensitive to national norms. Beggs found such an effect for Black males relative to White males in occupational positions and for Black females relative to White males in earnings. The result, as with the federal

government, is greater equality in occupational positions and in earnings between Whites and minority groups.

The higher percentage of high skill employees in an industry also decreased the relative inequality in occupations between White males and Black females, Black males, and White females (Beggs 1995). High skill jobs (defined by Beggs as professional, managerial, and technical occupations) in most cases require a college degree. Since higher levels of education are generally associated with less prejudice and discrimination, it is likely that the more high skill employees in an industry or area the more support there exists for equality.

Tomaskovic-Devey, Zimmer, and Harding (2002), however, advance a theory that suggests that inequality might increase in the same situation. The reason for the increase in inequality would be that relatively more powerful positions in an organization can make stronger claims on resources, and where there are more resources, there are more resources that can be claimed, resulting in greater inequality. Indeed, this is what they found in a study of gender inequality within organizations. A similar logic may apply to industries or areas with a high proportion of high skill jobs. Such industries or areas will, in general, have to be resource rich to support the higher earnings claimed by people in high skill jobs. In such contexts, it may be that there is more ideological support for equality but the economic reality may be that there is actually greater inequality.

I have briefly described some mechanisms that may change the social support for equality and consequently affect the relative amount of inequality in employment. What then are the mechanisms by which inequality in employment likely affects race, class, and gender inequality in educational achievement and outcomes? As described above and depicted in

Figure 1 inequality in employment has direct effects on inequality in educational achievement and outcomes and indirect effects through family and school. A prime direct effect is through youth evaluating the employment opportunity in their local frame of reference and adjusting their school performance and behavior to match where they think they will be upon completion of their education. Willis' (1977) and MacLeod's (1995) narratives of the experiences of poor and working class White male youth are clear evidence that this process occurs. Teachers also might adjust their expectations of students based on evaluation of their students' employment opportunities. Teacher judgments have been shown to have a significant effect on teacher evaluation of students and interactions with students (Alexander, Entwisle, and Thompson 1987; Farkas 1996). Differences in expectations on the part of students and teachers may be realized in classroom interactions as well as through tracking. Students or teachers may select different courses (e.g., general versus honors or Advanced Placement) based on expectations, which would significantly affect opportunities to learn and achievement (Kilgore 1991).

Beck and Colclough's (1988) finding that Blacks' and White females' returns on the value of education were more dependent on the local labor market than White males' suggests that these groups will be more affected by inequality in local employment. Thus, the inequality between White males and Black females, Black males, and White females in educational achievement and outcomes is likely to have a high correspondence with inequality between these same groups in local employment.

There are a number of ways in which inequality in local employment may affect inequality in educational achievement. Greater inequality in employment between two

groups (e.g., White college-educated males and Black males with less than a college education) will likely increase the amount of segregation by neighborhood or community. Given the effect of the proportion of the population that is Black on White discrimination described earlier, I would expect this segregation to be greatest between Whites and Blacks. Neighborhood or community segregation can in turn have several impacts on educational inequality. Because most students still attend schools based on where they live, schools become segregated. The consequence is that particular benefits and problems also become segregated. Schools where more affluent (and likely White) students attend will likely have more involvement from parents because either they will have jobs that allow them the flexibility to be involved in school activities or they will have jobs that pay enough to one individual to support a family, allowing one parent to have time to be involved in school. Also, more affluent parents will have more resources and abundance so they can give more support to the school financially, either through school PTAs or through taxing themselves (e.g., Chapel-Hill/Carrboro Schools in North Carolina). Schools where the parents are less affluent will have less parent involvement because parents will have jobs that are not flexible or they may be working more than one job. These parents, of course, will have fewer resources for financially supporting the school directly or for paying higher taxes to support the school. These differences result in a very different quality of education in the more affluent school compared to the less affluent school. These differences are manifest as differences in educational achievement and outcomes.

Even if students are not segregated into separate schools, there is likely segregation within schools. Research suggests that the greater the inequality in the backgrounds of the

students, the greater the segregation within the school through ability grouping and curricular tracks (Jones et al. 1995; Kilgore 1991). The result is that within schools in which there is a large inequality in the background of students (i.e., primarily socioeconomic status) the greater the inequality in educational achievement. Like other areas, I would expect this effect to be stronger when the proportion of the population that is Black is higher.

Segregation by neighborhood or community will have other effects that will likely result in inequality in educational achievement and outcomes. Residential segregation can also result in cultural segregation. Cultural segregation would be more detrimental to Blacks because the more powerful culture has been and continues to be White. White culture of course also dominates institutions, including education, which will put Blacks or other minority groups that are more culturally marginalized at a disadvantage. The greater this cultural marginalization, the greater the disadvantage. One way in which this disadvantage is realized is by a difference in expectations between White culturally-dominant teachers and Black students and their parents (Alexander, Entwisle, and Thompson 1987; Farkas 1996; Lareau and Horvat 1999). Cultural marginalization can also lead to youth peer group antagonism toward school (Fordham and Ogbu 1986).

There are two primary ways in which the amount of inequality in employment in neighboring areas may impact inequality in educational achievement in a local area. One way may be through its impact on the inequality in the local employment opportunity. This action might occur through a normative obligation. If inequality in employment is lower in a neighboring area than the local area, there may be normative pressure on the employers in the local area to lower the employment inequality in order to compete for workers. This effect

may be fairly small given that an industry appears to be strongly influenced by the context of the industry itself (Beggs 1995).

Another way in which the inequality in employment in the neighboring area may affect inequality in educational achievement and outcomes is through employees and therefore families. Presumably, workers at more of a disadvantage in a local area that observe lower inequality in employment in a neighboring area will seek employment in the neighboring area that is more to their advantage. Generally the workers that will be at a greater disadvantage in the local area will be Blacks and White females. There is, however, a cost of seeking employment in a neighboring area that will keep many workers from seeking employment in the neighboring area. While Black males and females may have the most to gain in such a situation, they may be least able to take advantage of it because of family obligations (as a result of higher incidence of single parents) or because of the cost of transportation (or lack of transportation at all). Therefore, disadvantaged White females and males, who although disadvantaged are likely more advantaged than Blacks, may be the best situated to take advantage of lower inequality in employment in a neighboring area. Any decrease in inequality they experience as a result will likely affect the neighborhood where they live with its consequent effects on inequality in achievement as well as effect their youth's assessment of employment opportunities and judgments about the value of education.

HYPOTHESES

Testing the conceptual model described above is a challenge both analytically and empirically. It is doubtful that all the data needed to test such a model exist in the same form, for the same time period, and with the necessary links to connect all the data together.

Attempting such a challenge is beyond the scope of this study. Additionally, the motivation for this study was to demonstrate an empirical link between the larger community context within which schools are embedded and differences in educational achievement among groups of students. While a more encompassing test of the model would be desirable from a standpoint of theoretical development, a more focused study is likely to be more persuasive to policy makers. Therefore, I have focused on a subset of these hypothesized relationships for the purpose of this study. This operational model is depicted in Figure 2.

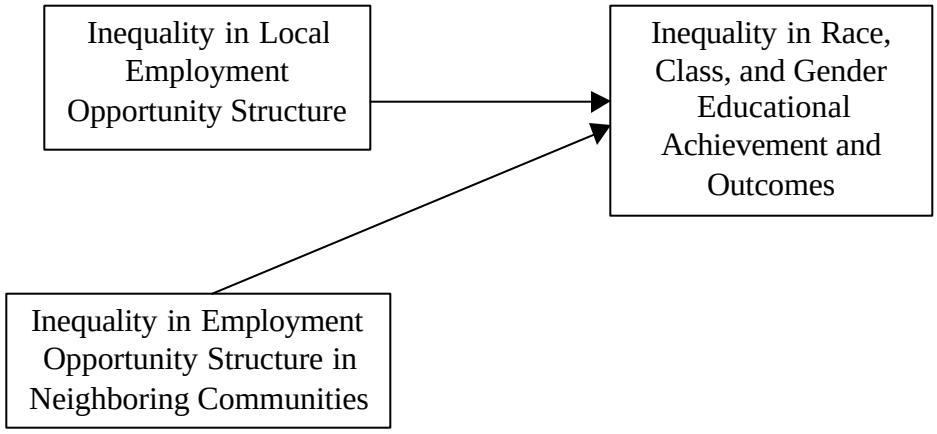

Figure 2. Operational Model of the Relationship Between Inequality in the Local Employment Opportunity Structure, Inequality in the Neighboring Community Employment Opportunity Structure, and Race, Class, and Gender Inequality in Educational Achievement and Outcomes.

Given the relationships hypothesized in this operational model, the proposed study asks is there a relationship between race, class, and gender inequality in the employment opportunity structure and race, class, and gender inequality in educational achievement and outcomes? As mentioned earlier, previous studies have demonstrated a relationship between the local employment opportunity and schooling, at the high school level. Some of these

studies do an excellent job of relating the employment opportunity of one community with a specific group of students (e.g., MacLeod 1995; Willis 1977). These studies often provide insight into one particular intersection of race, class, and gender (e.g., white, working-class males). Other studies have examined the relationship between variation in the employment opportunity in many communities with educational achievement or outcomes, usually examining differences in race or gender or both. What these studies have not done is a) examine the variation in employment opportunity across communities and b) incorporate the insights of Black feminists to examine race, class, and gender inequality as simultaneously experienced rather than as separate inequalities. In this study, I address these issues. Because the main focus of this study is examining the relationship between community context and educational achievement, this study does not address the more proximate causes of differences in educational achievement related to school and family factors. Family and school factors were excluded in part because of limitations of available data and in part because the research on these factors has been more extensive.

Generally, equality in employment has been measured by equality of earnings or by equality of occupations (e.g., managerial, professional, technical). Educational achievement and outcomes have traditionally been measured by standardized test results or by particular outcomes such as graduation, dropping out, retention, or similar measures. I predict that inequality among race, class, and gender groups in employment opportunity will be related to inequality among race, class, and gender groups in educational achievement in the local community. Specifically, I hypothesize:

H_{1A} The greater the equality among race, class, and gender groups in managerial, professional, and technical occupations in the local community, the greater the equality among race, class, and gender groups on high school language arts and science tests in the local community. This effect will be stronger for Black females and males and White females.

H_{1B} The greater the equality among race, class, and gender groups in managerial, professional, and technical occupations in neighboring communities, the greater the equality among race, class, and gender groups on high school language arts and science tests in the local community. This effect will be stronger for lower class status White females and males than for Black females and males.

H_{2A} The greater the equality among race, class, and gender groups in earnings in the local community, the greater the equality among race, class, and gender groups on high school language arts and science tests in the local community. This effect will be stronger for Black females and males and White females.

H_{2B} The greater the equality among race, class, and gender groups in earnings in the neighboring communities, the greater the equality among race, class, and gender groups on high school language arts and science tests in the local community. This effect will be stronger for lower class status White females and males than for Black females and males.

I also expect that some of the differences by gender will be ameliorated by the fact that while men and women are employed individually in the labor market, they often combine resources

in a family unit which provides benefit to both male and female students within that unit. Therefore, I control for this possible effect.

The overall socioeconomic structure of the community has also been shown to have an effect on educational achievement. Roscigno (1996) found that the family poverty rate had an overall depressing effect on achievement. Therefore, I also control for the possible mediating effect of poverty on the relationship between inequality in local employment opportunity and inequality in educational achievement. I expect that in a community with a higher poverty rate the relative inequality in educational achievement will be lower compared to a community with a lower poverty rate.

In the next chapter I specify the data, measures, and analysis strategy to test these hypotheses.

CHAPTER 3

METHODOLOGY: MEASURING RELATIVE INEQUALITY

In the previous chapter I reviewed research that has tried to account for the differences in educational achievement and outcomes by race, class, and gender. I identified family and school as the two social structures that are the most immediate causes of these differences. I also hypothesized a model that related these differences to the community context within which families and schools are embedded. Finally, I specifically hypothesized that there is a relationship between race, class, and gender inequality in the employment opportunity structure and inequality in educational achievement in a community. In this chapter I describe the data, measures, and analysis strategy I used to test this hypothesis.

DATA

The two key concepts in my hypotheses are a) race, class, and gender inequality and b) community variation (or spatial differences). I argue, following Beggs (1995), that inequality is a relation rather than an individual characteristic. This is consistent with theory that argues that any inequality exists because differences are socially constructed in relation to each other. For example, some theorists argue that there is no Black race without a White race, or more appropriately White is what is not defined as Black (e.g., Roediger 1999; Omi & Winant 1994).

To measure this relational character of inequality requires making comparisons between different race, class, and gender groups. Measuring this relational character of inequality has a direct connection to the issue of what is "the community." If neighborhood is defined as the community, there may be little difference in the race, class, and gender

inequality because neighborhoods tend to be fairly homogeneous. Another logical definition of community when examining inequality in educational achievement might be a school district. This definition might be especially appropriate in a school district where there is significant segregation between schools. A neighborhood or school district might not be a meaningful definition of community if you are considering the area in which there is a substantial concentration of employment. In this case one might argue that cities might be a reasonable definition of community. While this might work if you were only interested in large cities, using cities as the measure of community would exclude many people who live in unincorporated urban and suburban fringes or in rural areas. Ultimately, the ability to define a community geographically is limited by available data, and in this study to United States Census data.

I use data from two sources. One source of data is the public use 1989-90 end-of-course testing results from the North Carolina testing program for Biology and English I. The data consists of individual student records with test scores and student characteristics. Student and teacher names and identification numbers were removed from these data. I chose these subjects because there appear to be advantages to females in English/language arts achievement and advantages to males in mathematics and sciences as noted in Chapter 2. These were two (of four) courses that were required for students seeking a high school diploma that have state standardized multiple-choice tests. English I was primarily taken by students in the ninth grade and students typically took Biology in the tenth grade. Most studies comparing educational achievement use a measure of reading/language arts achievement and/or mathematics achievement. English I was the only course taken by

virtually all high school students with a multiple-choice test. Algebra I was the only mathematics course taken by virtually all students with a multiple-choice test. This course was not taken exclusively by high school students, however. About one-fifth of middle school students, mostly in eighth grade, also take Algebra I. Because Algebra I was not taken exclusively by high school students, and because there was no other mathematics course required of all students, I selected a science course, Biology, as an alternative to a mathematics course because it was required of all students graduating with a standard diploma. These data provide a common measure of achievement across schools for the vast majority of high school students. Information on the race, gender, and class status of each student was collected on each test.

The Census Bureau, in cooperation with the National Center for Education Statistics, provides public use school district demographic tabulations. These tabulations, however, do not provide the combination of race, class, and gender characteristics in employment opportunity hypothesized in this study. The 1990 Census microdata provides a five percent sample of the population that includes detailed questions about the household including information about the earnings, occupation, and education of adults in the household. These data on individual occupation, earnings, and education could be used to create the measures of employment opportunity hypothesized. The 1990 public use census data were not made available at the county level, which would have been preferred for this study. Public use census data, however, were made available in units of 100,000 people formally known as public use microdata areas (PUMAs). There were 47 PUMAs for North Carolina in the 1990 Census. While a PUMA cannot be associated with a particular school or schools, the Census

Bureau does provide information that allows a PUMA to be associated with counties, which in turn can be associated with one or more school districts. In cases where a PUMA encompassed more than one entire county, the measures based on the PUMA reflect data for the combined counties and corresponding school district and schools. If more than one PUMA covered a county then data from the corresponding PUMAs were combined to create a unit that encompassed the entire county. Combining PUMAs in this way resulted in there being a total of 40 modified PUMAs. Combining in this way resulted in the following aggregations:

Number where one PUMA equaled one school district/county = 13

Number where more than one PUMA equaled one school district/county = 4

Number where one PUMA equaled more than one school district/county = 23

The cases where one PUMA equaled one school district/county generally represented counties with at least one moderately sized city (e.g., Asheville, Wilmington), and the cases where more than one PUMA equaled one school district/county represented counties with a fairly large city (e.g., Charlotte, Raleigh, Fayetteville). In both cases, these areas represent the places with the best correspondence between the school community and the employment community. In well over half of the cases, however, aggregation of school districts was necessary, making the correspondence between the school community and employment community less than the one-to-one fit desired. Where school districts/counties were combined to equal the area represented by one PUMA, the school districts/counties were contiguous and, therefore, likely had common characteristics in terms of both employment and educational achievement.

MEASURES

Dependent Variables

Relative Inequality in Biology Achievement. Individual students were placed into groups based on race, gender, and class. There were two race groups, Black and White. Native American was the other identifiable racial/ethnic group available in the North Carolina End-of-Course data. When aggregated to the PUMA level, however, there were no more than seven PUMAs for which relative inequality in achievement could be calculated. Therefore, analyses were limited to Black and White students. Class status was dichotomized into students with a parent with a high school education or less and students with a parent with education beyond high school. This parental educational level was the highest category identified on the 1989-90 end-of-course tests. The other categories of parental educational level were a) eighth grade or less; b) eighth to twelfth; and c) high school graduate. This division of class status is at a fairly low level. Division into class status based on a higher educational level would have been preferable since, in general, there is a significant difference in class status measures (e.g., earnings, occupational opportunities) between individuals who have a bachelor's degree or higher and individuals who do not. For Biology students, 57.8% had parents with education beyond high school (55.7% for English I).

There were a total of eight groups (two race groups x two gender groups x two class status groups). A mean test score was calculated for each group at the school and PUMA level. A simple difference in group means could be used to measure the relative inequality. This difference would be expressed in the original unit of measurement for the test, which in

this case is the raw score. It is difficult to compare studies when the original unit of measurement is used because scoring scales vary. Consequently, the most recent edition of the APA *Publication Manual* (2001) states "it is almost always necessary to include some index of effect size or strength of relationship" (p. 25). Reporting effect size is also becoming a requirement in many journals that publish educational research (Thompson, 2002). Thus, differences in means in most educational research are expressed as effect sizes. An effect size (*d* index) is simply a difference expressed in standard deviation units. I used the effect size as my measure of relative inequality or difference in Biology achievement. The effect size was calculated by subtracting the mean raw score for White males with a parent with an education beyond high school from the mean raw score for a race, gender, and class group. The result was divided by the pooled standard deviation of the raw score for the groups of students compared. All effect sizes were calculated at the school and PUMA level using pooled standard deviations calculated at the appropriate school or PUMA level. A negative effect size means that White males with a parent with education beyond high school scored higher on average, a positive effect size means they scored lower than the comparison group. An example of this calculation is provided in Figure 3. To measure the relative inequality in Biology achievement I compared Biology test scores for race, gender, and class groups with White males with a parent with education beyond high school, and divided the result by the pooled standard deviation for the groups compared.

An effect size is exactly equivalent to a z-score, assuming a normal distribution. A more familiar interpretation of the effect size is in terms of the percent under the normal curve that it represents. In the example in Figure 3, an effect size of –1.4 represents 92% of

the area under the normal curve, which could be interpreted as the average Black male would score lower than 92% of White males.

Biology Scores

White Male Student Number	White Male Student Raw Score	Black Male Student Number	Black Male Student Raw Score
W001	65	B001	55
W002	71	B002	61
W003	59	B003	49
W004	67	B004	57
W005	63	B005	53
W006	57		
W007	72		
W008	69		
W009	61		
W010	58		

Effect Size

Mean for White Males	64.2
Mean for Black Males	55.0
Standard Deviation (Pooled)	6.7

$$d = \frac{55.0 - 64.2}{6.7}$$

$$= -1.4$$

Figure 3. Example Data and Calculations for Dependent Variable Measure Effect Size.

Relative Inequality in English I Achievement. The same measure of relative inequality used for Biology was employed for relative inequality in English I achievement.

Independent Variables

Relative Inequality in Quality of Employment, Local Community. To measure the relative inequality in the quality of employment in the local community I contrasted the proportion of a race, class, and gender group that was in managerial, professional, and technical occupations compared to the proportion of White males with education beyond high school in these same occupations aggregated at the PUMA level. Managerial, professional, and technical occupations are generally recognized as high skill occupations. I used the following 1990 Census occupation codes to define these high skill occupations:

001-202 managerial and professional specialty occupations

203-242 technicians and related support occupations

243-252 supervisors and proprietors, sales occupations

253-257 sales representatives, finance and business services

This grouping of occupations has been used in previous studies and they have been the focus of discrimination lawsuits (Beggs 1995; Burstein 1989).[2]

While there are numerous measures of class status available in the census data, the only measure common to both sets of data was educational level (in the case of the achievement data, parental educational level). Class status was dichotomized between those with a high school education or less and those with education beyond high school to be consistent with the categorization of the achievement data.

Beggs (1995) tested three measures of quality of employment as a dependent variable using four race and gender groups (Black men, Black women, White men, and White women). The measure that appeared to be most sensitive in detecting variation was a measure he termed the inequality of relative share (IRS) index. The IRS index was calculated as the ratio of the percentage of a race, gender, and class group in managerial, professional, and technical occupations to the percentage of white males with education beyond high school.[3] The ratio was then transformed into a log. The exponent of the

[2] Additional analyses were conducted that included these occupations and census occupation codes 503-702, precision production, craft, and repair occupations as a broader representation of skilled workers. The regression results were nearly the same, with significant effects occurring slightly more often with managerial, professional, and technical occupations alone. Given that managerial, professional, and technical occupations represent higher status positions, I chose to present the results using these occupations alone.

[3] The individual weights provided in the Census data were used to estimate the frequency of individuals in the population prior to calculating the percentages for the relative inequality in quality of employment and relative inequality in earnings measures.

absolute value of the log was taken, and the value one was subtracted from the result to recenter the value around zero. Finally, the sign from the original log transformation was assigned to the resulting value. On this measure, a value of zero means that a race, gender, and class group had a share of employment in managerial, professional, and technical occupations equal to that of White males with education beyond high school. A value of +1 indicates that a race, gender, class group has twice the relative share of employment in managerial, professional, and technical occupations of White males with education beyond high school. A value of –1 indicates that White males with education beyond high school have twice the relative share of employment in managerial, professional, and technical occupations compared to the race, gender, and class group.

Relative Inequality in Quality of Employment, Neighboring Communities. As stated earlier, the labor market opportunity in the local community is likely effected by labor market opportunity in neighboring communities. Although many people will work within the local community as defined by the PUMA in which they live, some people will commute to neighboring PUMAs for employment. This measure corrects for the effect of slippage in employment from the local community to neighboring communities. To measure the effect of quality of employment in neighboring communities, I employed the IRS measure of quality of employment in the local community, but aggregated the data based on the PUMAs surrounding the PUMA that is the focus of the local community effect.

Relative Inequality in Earnings, Local Community. A number of different methods of measuring earnings inequality have been used in previous research. These measures have generally used differences in ranks or differences in relative distance of ranks (e.g., Fossett

and South 1983; Lieberson 1976). The IRS index described above for quality of employment captures both of these concepts. Therefore, I employed the IRS index for earnings using mean earnings rather than percentages. This measure is aggregated at the PUMA level.

Relative Inequality in Earnings, Neighboring Communities. To measure the effect of earnings in neighboring communities, I employed the IRS index of earnings, but aggregated based on the PUMAs surrounding the PUMA that is the focus of the local community effect.

Control Variables

Community Family Structure. Ideally the parental status (two-parent, single parent, step-parent and parent) for each individual student would be known. This information was not collected for North Carolina students and the student information cannot be linked to census or other data, which would provide precise information. As an approximation of the family structure in the community, I calculated the percent of two-parent families with children 18 years of age or younger in the PUMA in the 1990 Census microdata weighted by the household weight variable. While this measure may slightly overestimate the percentage of two-parent families because of the inclusion of families with preschool-age children as well as the inclusion of two-parent families with children not enrolled in public schools, it does serve as a close estimate of the actual percentage in the student population. I used the total percent of two-parent families based on Caldas and Bankston's (1999) finding that as the overall percentage of single parents in a school increased, the lower was overall achievement on a tenth-grade graduation test, and lower still was the achievement of children in single-parent families.

Family Poverty Rate. The 1989 family poverty rate was calculated by PUMA from 1990 Census microdata using the household weight variable. For these data, family was defined as families with related children 18 years of age or younger. Poverty status was determined by using the Census variable, POVERTY, which expresses the family's total income for the previous year as a percentage of the poverty threshold in 1990 (adjusted for inflation). Families that had a percentage of the poverty threshold of 100% or less were classified as in poverty. This measure was calculated as a percentage.

ANALYSIS STRATEGY

The Biology and English I achievement data had school-level identifiers, which meant the relative inequality in achievement could be calculated at a school level. As with other studies using achievement data, the greatest variance in individual-level achievement was within schools (approximately 90% for Biology, 92% for English I based on a one-way analysis of variance). In other words, only 10% of the variance in individual-level Biology achievement was attributable to differences between schools (8% for English I achievement).

Because the independent variables were grouped according to the modified PUMAs, aggregating the individual achievement data to the PUMA level was another possibility for purposes of analysis. Not surprisingly, because PUMAs represent a much larger number of students over a larger geographic area than schools, the individual-level variance in achievement was even larger within PUMAs than within schools (97% for Biology; 98% for English I).

Since the focus of this study was differences in educational achievement *between* spatial areas rather than *within* spatial areas, these analyses of variance results suggest that

there was a small, although educationally significant, amount of variance to be explained by any analysis model. This represents variance in the absolute level of achievement in Biology and English I and not relative inequality in achievement that was the focus of this study. The lowest level at which *relative* inequality in achievement could be measured was the school level. The school is also the level at which most relative inequality would actually be experienced by students. The lowest level at which relative inequality in employment opportunity could be measured was at the (modified) PUMA level. Having these two levels suggested a hierarchical approach would be more appropriate. Thus, the analysis model was actually attempting to explain the relative inequality in school-level achievement between PUMAs. An estimate of the amount of variance in relative inequality in school achievement between spatial areas (PUMAs) that the analysis model could explain is presented in Table 1.

Table 1. Amount of Variance in School-Level Relative Inequality in Achievement Explained by Differences in PUMAs.

Group	Biology R^2	English I R^2
Black females with parents with education beyond high school (BFHS+)	0.23	0.22
Black females with parents with high school education or less (BFHS)	0.30 **	0.23
Black males with parents with education beyond high school (BMHS+)	0.32 *	0.25
Black males with parents with high school education or less (BMHS)	0.33 **	0.20
White females with parents with education beyond high school (WFHS+)	0.18 *	0.13
White females with parents with high school education or less (WFHS)	0.20 **	0.15
White males with parents with high school education or less (WMHS)	0.15	0.14

F-test probability *p<0.10 **p<0.05 ***p<0.01

As shown in Table 1, the amount of variance between PUMAs ranged from 14% and 33%. These results indicated there was more variance between PUMAs in relatively inequality in achievement to be explained than variance between PUMAs in absolute achievement. These

results also indicated that there was a moderate amount of relative inequality in achievement that could be explained by models of differences between spatial areas, and certainly enough to have important policy implications if the models were supported.

There was generally more variance in relative inequality in school-level achievement between PUMAs for Black females and males compared to White females and male groups. This result is consistent with the expectation that relative inequality would be less between White females (WFHS+ and WFHS) and males (WMHS) relative to White males with parents with education beyond high school (WMHS+), than between Black females and males and WMHS+ students. There was also generally more variance between PUMAs in relative inequality in Biology achievement than English I achievement for each of the groups. This difference may be due to a difference in the importance of school-level processes, including student effort, in Biology compared to English I, since Biology knowledge and skills are likely to be almost completely learned in school while English knowledge and skills are more likely to be learned through a combination of school and family experiences.

These analyses of variance results suggested that a hierarchical analysis would be most appropriate. However, there were a large number of schools in which one of more of the groups of Black females or males were not represented, and therefore, school-level relative inequality in achievement could not be calculated. For example, in Biology there were 327 schools with Biology achievement results, but only 139 (42.5%) in which relative inequality could be calculated between BFHS+ students and WMHS+ students (for BFHS students it was 50.8%, for BMHS+ students 44.0%, and for BMHS students 48.6%). On the other hand, relative inequality in Biology achievement could be calculated for 80% or more

of the schools for White females and males. When relative inequality in achievement was aggregated to the PUMA level, there was much better representation of all groups. Of the 40 modified PUMAs, BFHS+ students were represented in 39, BFHS and BMHS+ students in 38, and BMHS students in 37. White females and males were represented in all PUMAs. This disparity in school-level versus PUMA-level representation suggests that there was a fairly high level of segregation between schools that would not be captured if relative inequality in school-level achievement alone was the focus of analysis. Therefore, I analyzed two sets of models. One set of models represented the hierarchical approach using relative inequality in school-level achievement as the dependent variable and relative inequality in PUMA-level quality of employment and earnings. A second set of models used an ordinary least squares approach with relative inequality in PUMA-level achievement as the dependent variable and relative inequality in PUMA-level quality of employment and earnings to better capture effects of relative inequality in achievement that could not be captured at the school-level alone.

Hierarchical Linear Models

The analysis of the effect of PUMA-level relative inequality in employment opportunity structure on school-level relative inequality in educational achievement required a multilevel analysis. I used the SAS MIXED procedure to estimate the effects of the independent and control variables on school-level relative inequality in educational achievement. Specifically, I analyzed the following general equations.

Equation 1: $SUBJECT_{ij} = \gamma_{00} + u_{0j} + r_{ij}$

where:

$SUBJECT_{ij}$ is the inequality in the subject, either English I or Biology, for a particular race, class, and gender group (e.g, Black females with a parent with education beyond high school) relative to White males with parents with education beyond high school for the *i*th school in the *j*th PUMA;

γ_{00} is the intercept or grand mean of school-level relative inequality in achievement;

u_{0j} is the effect of the PUMA on the school-level relative inequality in achievement; and

r_{ij} is the variation in SUBJECT that is unexplained by PUMA for the *i*th school in the *j*th PUMA.

This equation is equivalent to a one-way analysis of variance and is useful in evaluating hierarchical models by providing a baseline set of covariance parameter estimates to which models with estimated coefficient effects can be compared.

Equation 2: $$SUBJECT_{ij} = \gamma_{00} + \gamma_{01}EMPL_j + \gamma_{02}EMPN_j + u_{0j} + r_{ij}$$

Equation two adds the effect (γ_{01}) of relative inequality in quality of employment in the local area (EMPL) and the effect (γ_{02}) of relative inequality in quality of employment in the neighboring area (EMPN) for the same race, class, gender group as the relative inequality for SUBJECT. Both EMPL and EMPN were measured at the PUMA level.

Equation 3: $$SUBJECT_{ij} = \gamma_{00} + \gamma_{01}EMPL_j + \gamma_{02}EMPN_j + \gamma_{03}FAMSTRUC_j + \gamma_{04}FAMPOV_j + u_{0j} + r_{ij}$$

Equation three adds the effects of controlling for the community family structure (FAMSTRUC) and family poverty rate (FAMPOV) in the equation.

Equation 4: $$SUBJECT_{ij} = \gamma_{00} + \gamma_{01}EARNL_j + \gamma_{02}EARNN_j + u_{0j} + r_{ij}$$

Equation 5: $SUBJECT_{ij} = \gamma_{00} + \gamma_{01}EARNL_j + \gamma_{02}EARNN_j + \gamma_{03}FAMSTRUC_j + \gamma_{04}FAMPOV_j + u_{0j} + r_{ij}$

Equations four and five are the same as equations two and three except the relative inequality in earnings (EARNL and EARNN) are substituted for the relative inequality in the quality of employment.

Ordinary Least Squares Models

The analysis of the effect of PUMA-level relative inequality in employment opportunity structure on PUMA-level relative inequality in educational achievement was straightforward since all the variables were measured at the same level. I used the SAS REG procedure to obtain ordinary least squares multiple regression estimates of the effects of the independent and control variables on educational achievement. Specifically, I analyzed the following general equations.

Equation 1: $SUBJECT_j = \beta_0 + \beta_1 EMPL_j + \beta_2 EMPN_j + e$

where:

SUBJECT is the inequality in the subject, either English I or Biology, for a particular race, class, and gender group (e.g, Black females with a parent with education beyond high school) relative to White males with parents with education beyond high school for the *j*th school;

β_0 is the intercept or the mean relative inequality across PUMAs;

β_1 is the effect on SUBJECT of the relative inequality in the quality of employment in the local community (EMPL) for the same race, class, and gender group as SUBJECT;

β_2 is the effect on SUBJECT of the relative inequality in the quality of employment in neighboring communities (EMPN) for the same race, class, and gender group as SUBJECT; and

e is the variation in SUBJECT that is unexplained by the quality of employment measures.

Equation 2: $SUBJECT = \beta_0 + \beta_1 EMPL + + \beta_2 EMPN + \beta_3 FAMSTRUC + \beta_4 FAMPOV + e$

Equation two adds the effects of controlling for the community family structure (FAMSTRUC) and family poverty rate (FAMPOV) in the equation.

Equation 3: $SUBJECT = \beta_0 + \beta_1 EARNL + \beta_2 EARNN + e$

Equation 4: $SUBJECT = \beta_0 + \beta_1 EARNL + \beta_2 EARNN + \beta_3 FAMSTRUC + \beta_4 FAMPOV + e$

Equations three and four are the same as equations one and two except the relative inequality in earnings (EARNL and EARNN) is substituted for the relative inequality in the quality of employment.

The regressors in the ordinary least squares models were checked to insure that there was not a high degree of correlation between them, especially between percent of two-parent families (FAMSTRUC) and percent of families in poverty (FAMPOV). The degree of correlation was assessed using a variance inflation factor. A variance inflation factor of one would indicate no correlation between regressors, while a variance inflation factor of five would indicate a relatively high correlation between regressors. For these models, the variance inflation factor for relative inequality in quality of employment and relative inequality in earnings (local and neighboring area) generally ranged from 1.0 to 2.0. These

values indicated that local and neighboring area relative inequality in quality of employment or earnings had relatively little correlation with each other or with the family measures. The variance inflation factor for percent of two-parent families and percent of families in poverty ranged from 1.9 to 3.5 with most values 2.6 or less. These values indicated that these family measures were moderately correlated with each other, but distinct enough that they were measuring different factors.

In the next chapter, I present descriptive statistics for variables in this study and the results of the regression analyses.

CHAPTER 4

TESTING A THEORY OF INEQUALITY

My central hypothesis is that the greater the equality among race, class, and gender groups in employment in their local community and in neighboring communities, the greater the equality among race, class, and gender groups on high school language arts and science tests in the local community. In this chapter I present descriptive statistics for the measures of equality of employment and achievement, and the results of regressing measures of equality of employment on equality of achievement.

DESCRIPTIVE STATISTICS

Dependent Variables

Relative Inequality in Achievement, School-Level. The school-level relative inequality in achievement on the North Carolina Biology and English I End-of-Courses tests for 1989-90 is presented in Table 2. Presented is the relative inequality in achievement between White male students with a parent educated beyond high school (WMHS+) and seven other race, class, and gender groups. Across all the schools, the mean effect size for Biology was negative, indicating that the average achievement of all seven groups was below the achievement of WMHS+ students. The greatest difference as indicated by effect size was between WMHS+ students and Black male students with a parent with a high school education or less (BMHS). The effect size of –1.28 indicates that the average BMHS student scored lower than 90.0% of the comparison group of WMHS+ students. The average effect size for Black females with parents with a high school education or less (BFHS) was similar. The average effect size for both the WFHS and WMHS groups was -0.60 indicating that they

Table 2. Descriptive Statistics for School-Level Relative Inequality (Effect Size) in Biology and English I Achievement Compared to White Males with a Parent with More than High School Education (WMHS+).

Relative Inequality in Biology Achievement (Effect Size)

Group	N	Mean	Min	Max	SD	Skewness	Kurtosis
Black Females, More than High School Educated Parents (BFHS+)	139	-0.76	-1.65	-0.05	0.32	0.09	-0.12
Black Females, High School Educated or Less Parents (BFHS)	166	-1.19	-1.86	-0.41	0.29	0.03	-0.33
Black Males, More than High School Educated Parents (BMHS+)	144	-0.78	-1.48	0.10	0.30	0.53	0.12
Black Males, High School Educated or Less Parents (BMHS)	159	-1.28	-1.96	-0.68	0.28	0.00	-0.58
White Females, More than High School Educated Parents (WFHS+)	293	-0.08	-1.17	0.75	0.25	-0.49	2.04
White Females, High School Educated or Less Parents (WFHS)	268	-0.60	-1.57	0.21	0.27	0.05	0.49
White Males, High School Educated or Less Parents (WMHS)	264	-0.60	-1.39	0.18	0.27	-0.07	-0.16

Relative Inequality in English I Achievement (Effect Size)

Group	N	Mean	Min	Max	SD	Skewness	Kurtosis
Black Females, More than High School Educated Parents (BFHS+)	166	-0.24	-1.38	0.66	0.33	0.24	0.60
Black Females, High School Educated or Less Parents (BFHS)	185	-0.72	-1.52	0.28	0.32	0.31	0.14
Black Males, More than High School Educated Parents (BMHS+)	162	-0.70	-1.47	0.29	0.33	0.22	0.08
Black Males, High School Educated or Less Parents (BMHS)	187	-1.16	-2.33	-0.22	0.33	-0.14	0.81
White Females, More than High School Educated Parents (WFHS+)	319	0.38	-0.31	1.09	0.23	0.21	0.41
White Females, High School Educated or Less Parents (WFHS)	301	-0.17	-1.05	0.78	0.28	0.07	0.42
White Males, High School Educated or Less Parents (WMHS)	298	-0.62	-1.28	0.02	0.26	-0.17	-0.02

scored lower than 72.6% of WMHS+ students. The average effect sizes for BFHS+ and BMHS+ students were slightly higher at –0.76 and –0.78 respectfully. The effect size for WFHS+ students was –0.08, indicating their average achievement was most nearly like the achievement of WMHS+ students.

The pattern of results for relative inequality in English I achievement was somewhat different. Unlike the Biology results, one group, WFHS+ students had a positive effect size, indicating that on average they scored higher than WMHS+ students. WFHS and BFHS+ had similar average effect sizes (–0.17 and –0.22 respectfully). WFHS students on average scored lower than 56.8% of WMHS+ students, and BFHS+ students scored lower than 58.7% of WMHS+ students.

Like Biology, BMHS students had the lowest average effect size compared to WMHS+ students. The next lowest groups, with similar average effect sizes, were WMHS, BMHS+, and BFHS students with average effect sizes of –0.62, -0.70, and –0.72 respectively.

Relative Inequality in Achievement, PUMA-Level. The PUMA-level relative inequality in achievement on the North Carolina Biology and English I End-of-Courses tests for 1989-90 is presented in Table 3. The pattern of average effect sizes was the same as for the school-level relative inequality in Biology and English I achievement. In some cases the average effect size for PUMA-level relative inequality in achievement was identical to the school-level effect size. Consistent with there being less variance between PUMAs, the standard deviations for PUMA-level relative inequality in achievement were smaller than the school-level standard deviations.

Table 3. Descriptive Statistics for PUMA-Level Relative Inequality (Effect Size) in Biology and English I Achievement Compared to White Males with a Parent with More than High School Education (WMHS+).

Relative Inequality in Biology Achievement (Effect Size)

Group	N	Mean	Min	Max	SD	Skewness	Kurtosis
Black Females, More than High School Educated Parents (BFHS+)	39	-0.72	-1.00	-0.15	0.16	1.16	2.97
Black Females, High School Educated or Less Parents (BFHS)	38	-1.18	-1.58	-0.69	0.17	0.23	1.42
Black Males, More than High School Educated Parents (BMHS+)	38	-0.82	-1.37	-0.51	0.18	-0.72	1.17
Black Males, High School Educated or Less Parents (BMHS)	39	-1.28	-1.63	-0.72	0.20	0.79	1.60
White Females, More than High School Educated Parents (WFHS+)	40	-0.07	-0.22	0.16	0.08	0.57	0.08
White Females, High School Educated or Less Parents (WFHS)	40	-0.65	-0.87	-0.42	0.12	0.17	-0.87
White Males, High School Educated or Less Parents (WMHS)	40	-0.65	-0.91	-0.46	0.11	-0.13	-0.17

Relative Inequality in English I Achievement (Effect Size)

Group	N	Mean	Min	Max	SD	Skewness	Kurtosis
Black Females, More than High School Educated Parents (BFHS+)	39	-0.22	-0.48	0.02	0.16	-0.11	-1.13
Black Females, High School Educated or Less Parents (BFHS)	39	-0.68	-1.05	-0.37	0.17	-0.16	-0.25
Black Males, More than High School Educated Parents (BMHS+)	38	-0.68	-1.02	-0.30	0.16	-0.22	-0.10
Black Males, High School Educated or Less Parents (BMHS)	39	-1.11	-1.45	-0.68	0.17	0.48	1.00
White Females, More than High School Educated Parents (WFHS+)	40	0.38	0.26	0.49	0.07	-0.13	-1.45
White Females, High School Educated or Less Parents (WFHS)	40	-0.22	-0.49	0.03	0.12	-0.10	-0.68
White Males, High School Educated or Less Parents (WMHS)	40	-0.67	-0.82	-0.43	0.10	0.47	-0.64

Independent Variables

The independent variables were measured using the inequality of relative share (IRS) index, which is analogous to a ratio of proportions with a mean of zero. Descriptive statistics for quality of employment and earnings measures are presented in Tables 4 and 5.

Relative Inequality in Quality of Employment, Local Community. All groups had a lower average proportion of managerial, professional, and technical occupations than WMHS+ workers, except for WFHS+ workers, which had a very slight advantage (translated into percentages it would be an advantage of 51% to 49%). WMHS+ workers had approximately an 18 to 1 advantage on average over BMHS workers in the proportion in managerial, professional, and technical occupations. WMHS+ workers had approximately an 8 to 1 advantage on average over BFHS workers, a 4 to 1 advantage over WMHS workers, and a 3 to 1 advantage over WFHS workers. WMHS+ workers had approximately a 2 to 1 advantage on average over BFHS+ and BMHS+ workers.

Relative Inequality in Quality of Employment, Neighboring Communities. The relative inequality in employment in managerial, professional, and technical occupations in neighboring communities was nearly the same as in local communities (PUMAs). The advantage of WMHS+ workers over other White males and White females was about the same in neighboring communities as it was in local communities. The pattern of advantage for WMHS+ workers over Black females and males in neighboring communities was the same as the pattern in local communities, except that advantage in neighboring communities was somewhat attenuated (see Table 4).

Table 4. Descriptive Statistics for Inequality of Relative Share Index of Quality of Employment in Local and Neighboring Communities Compared to White Males with More than a High School Education.

Relative Inequality in Quality of Employment in the Local (PUMA) Community (IRS Index)

Group	N	Mean	Min	Max	SD	Skewness	Kurtosis
Black Females, More than High School Educated (BFHS+)	40	-1.05	-20.48	0.05	3.19	-6.09	37.91
Black Females, High School Educated or Less (BFHS)	39	-6.97	-20.89	-1.27	3.86	-1.55	3.44
Black Males, More than High School Educated (BMHS+)	40	-0.87	-2.78	0.28	0.64	-1.03	1.48
Black Males, High School Educated or Less (BMHS+)	38	-17.31	-123.00	-1.30	24.77	-3.31	10.85
White Females, More than High School Educated (WFHS+)	40	0.04	-0.18	0.42	0.12	0.97	1.54
White Females, High School Educated or Less (WFHS)	40	-2.11	-3.63	-0.86	0.69	-0.13	-0.34
White Males, High School Educated or Less (WMHS)	40	-2.95	-4.84	-1.39	0.77	-0.34	0.02

Relative Inequality in Quality of Employment in Neighboring (PUMA) Communities (IRS Index)

Group	N	Mean	Min	Max	SD	Skewness	Kurtosis
Black Females, More than High School Educated (BFHS+)	40	-0.50	-0.97	-0.19	0.20	-0.59	0.00
Black Females, High School Educated or Less (BFHS)	40	-6.55	-9.51	-2.70	1.21	0.23	2.46
Black Males, More than High School Educated (BMHS+)	40	-0.77	-1.36	-0.25	0.24	-0.34	-0.02
Black Males, High School Educated or Less (BMHS+)	40	-10.18	-17.44	-4.85	2.63	-0.79	0.70
White Females, More than High School Educated (WFHS+)	40	0.01	-0.14	0.25	0.08	0.74	1.47
White Females, High School Educated or Less (WFHS)	40	-2.22	-3.11	-1.11	0.52	0.58	-0.60
White Males, High School Educated or Less (WMHS)	40	-3.09	-3.93	-1.89	0.58	0.36	-1.00

Relative Inequality in Earnings, Local Community. The pattern of results for relative inequality in earnings was quite different from the patterns for relative inequality in quality of employment. Whereas WFHS+ workers had the least relative inequality in quality of employment compared to WMHS+ workers, BMHS+ workers had the least relative inequality in earnings. WMHS+ workers had on average a 1.6 to 1 advantage in average earnings compared to BMHS+ workers. The relative inequality in earnings of BMHS+ workers was only slightly better than that of WMHS workers; the range of relative inequality for BMHS+ workers was actually greater (see Table 5).

Black and White females with a high school education or less had the greatest relative inequality in earnings relative to WMHS+ workers (3.3:1 and 2.7:1 respectively). The relative inequality in earnings for BFHS+ and for BMHS workers was about the same at ratios of 1.4:1 and 1.3:1 respectively.

Relative Inequality in Earnings, Neighboring Communities. The pattern of relative inequality in earnings for neighboring communities was nearly identical to the pattern for relative inequality in earnings in the local community. Except for Black females with education beyond high school, the relative inequality in earnings in neighboring communities was slightly greater than in the local community.

Table 5. Descriptive Statistics for Inequality of Relative Share Index of Earnings in Local and Neighboring Communities Compared to White Males with More than a High School Education.

Relative Inequality in Earnings in the Local (PUMA) Community (IRS Index)

Group	N	Mean	Min	Max	SD	Skewness	Kurtosis
Black Females, More than High School Educated (BFHS+)	40	-1.37	-1.97	-0.71	0.33	-0.15	-0.61
Black Females, High School Educated or Less (BFHS)	40	-2.27	-3.55	-0.75	0.53	-0.17	1.25
Black Males, More than High School Educated (BMHS+)	40	-0.58	-1.00	0.00	0.24	0.49	-0.21
Black Males, High School Educated or Less (BMHS+)	40	-1.34	-2.15	-0.69	0.30	-0.29	0.40
White Females, More than High School Educated (WFHS+)	40	-0.91	-1.16	-0.59	0.16	-0.07	-1.04
White Females, High School Educated or Less (WFHS)	40	-1.66	-2.43	-1.25	0.26	-0.72	0.88
White Males, High School Educated or Less (WMHS)	40	-0.60	-0.87	-0.26	0.13	0.33	0.44

Relative Inequality in Earnings in the Neighboring (PUMA) Communities (IRS Index)

Group	N	Mean	Min	Max	SD	Skewness	Kurtosis
Black Females, More than High School Educated (BFHS+)	40	-1.36	-1.71	-1.13	0.13	-0.55	0.28
Black Females, High School Educated or Less (BFHS)	40	-2.34	-3.01	-1.42	0.35	1.00	0.51
Black Males, More than High School Educated (BMHS+)	40	-0.63	-0.82	-0.41	0.10	0.25	-0.59
Black Males, High School Educated or Less (BMHS+)	40	-1.43	-1.77	-0.93	0.20	0.51	-0.11
White Females, More than High School Educated (WFHS+)	40	-0.93	-1.16	-0.82	0.07	-0.87	1.63
White Females, High School Educated or Less (WFHS)	40	-1.74	-2.43	-1.53	0.15	-2.59	10.92
White Males, High School Educated or Less (WMHS)	40	-0.66	-0.82	-0.48	0.09	0.23	-0.91

Control Variables

Community Family Structure. The community family structure was measured using the percent of two-parent families with children 18 years old or less. This percentage ranged from 55.8% to 80.5% with a mean of 70.6%.

Family Poverty Rate. The mean 1989 poverty rate across PUMAs was 15.4%. The poverty rate ranged from a low of 7.5% to a high of 28.4%. See Table 6.

Table 6. Descriptive Statistics for Percent of Two-Parent Families with Children 18 years-old or younger and Family Poverty Rate in the Local (PUMA) Community.

Group	N	Mean	Min	Max	SD	Skewness	Kurtosis
Percent of Two-Parent Families	40	70.58	55.83	80.48	5.18	-0.51	0.67
Percent of Families in Poverty	40	15.36	7.54	28.39	5.26	0.55	-0.43

REGRESSION RESULTS

Hierarchical Linear Models

Relative Inequality in Quality of Employment and Relative Inequality in Biology Achievement. The mixed model estimates of relative inequality in Biology achievement relative to WMHS+ students on relative inequality in quality of employment, community family structure, and family poverty rate are presented in Table 7. An analysis of variance and two hierarchical linear regression equations are shown for each of the seven race, class, and gender comparisons. The one-way analysis of variance shows the partialling of the

Table 7. Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate.

	Black Females, More than High School Educated Parents (BFHS+)			Black Females, High School Educated or Less Parents (BFHS)			Black Males, More than High School Educated Parents (BMHS+)			Black Males, High School Educated or Less Parent (BMHS)		
	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2
Relative Inequality in Quality of Employment												
Local (PUMA) Area		0.198 *	-0.021		-0.004	-0.005		0.007	0.059		0.000	0.000
Neighboring (PUMA) Areas		0.279	-0.066		-0.007	-0.011		-0.097	0.035		-0.007	-0.011
Controls												
Percent of Two-Parent Families Local (PUMA) Area			0.010			0.026 **			0.009			0.018 *
Percent of Families in Poverty Local (PUMA) Area			0.026 *			0.026 **			0.025 **			0.021 **
Intercept		-0.549 ***	-1.920 *		-1.260 ***	-3.500 ***		-0.855 ***	-1.688 *		-1.355 ***	-2.993 ***
Covariance Estimates												
Between PUMAs	0.002	0.000	0.000	0.008	0.010	0.003	0.010	0.012	0.000	0.007	0.007	0.004
Schools Within PUMA	0.100 ***	0.099 ***	0.095 ***	0.076 ***	0.076 ***	0.076 ***	0.080 ***	0.081 ***	0.083 ***	0.070 ***	0.068 ***	0.068 ***
N	139	139	139	166	166	166	144	144	144	159	159	159

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

Table 7 (continued). Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate.

	White Females, More than High School Educated Parents (WFHS+)			White Females, High School Educated or Less Parents (WFHS)			White Males, High School Educated or Less Parent (WMHS)		
	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2
Relative Inequality in Quality of Employment									
Local (PUMA) Area		0.045	-0.018		0.050	0.052		-0.016	-0.010
Neighboring (PUMA) Areas		-0.352	-0.362		-0.063	-0.135 *		0.057	0.061
Controls									
Percent of Two-Parent Families Local (PUMA) Area			0.012 **			0.012 *			0.005
Percent of Families in Poverty Local (PUMA) Area			0.007			0.016 **			0.003
Intercept		-0.072 ***	-1.017 **		-0.635 ***	-1.890 ***		-0.466 ***	-0.834 *
Covariance Estimates									
Between PUMAs	0.004	0.004	0.001	0.005	0.006	0.003	0.001	0.001	0.001
Schools Within PUMA	0.059 ***	0.059 ***	0.060 ***	0.070 ***	0.070 ***	0.070 ***	0.074 ***	0.073 ***	0.073 ***
N	293	293	293	268	268	268	264	264	264

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

variance in school-level relative inequality in Biology achievement between spatial areas (PUMAs) and the variance in school-level relative inequality in Biology achievement within a spatial area. For all groups, the covariance estimate for variance in school-level relative inequality between PUMAs was extremely small and non-significant, indicating there was no statistically significant variance between spatial areas in the amount of school-level relative inequality in Biology achievement.

Equation one for each group shows the effect of the primary theoretical variables of interest, local and neighboring area (PUMA) relative inequality in quality of employment. Equation two for each group shows the effect of the relative inequality in quality of employment with controls for the mediating family factors of percent of two-parent families and percent of families in poverty.

There was one group for which the relative inequality in quality of employment had a significant effect on relative inequality in Biology achievement as hypothesized: Black females with parents with a high school education or more (BFHS+). Relative inequality in the local area quality of employment had a positive effect on the relative inequality in Biology achievement. The effect of a 2:1 increase in relative inequality in quality of employment was about a two-tenths of a standard deviation increase in the relative inequality in Biology achievement. This effect does appear to be mediated by the percent of families in poverty, so much so that it was no longer significant.

Among White females with parents with a high school education or less (WFHS) students it was the relative inequality in quality of employment in neighboring areas that had an effect on relative inequality in Biology achievement. The effect, however, was not in the direction expected. For this group, as the relative inequality in quality of employment in

neighboring areas decreased, the relative inequality in Biology achievement increased. Given that this effect was not significant until the mediating family factors were introduced into the model, it is likely that neighboring area relatively inequality in quality of employment reached significance by chance.

For six of the seven comparison groups, the percent of two-parent families and/or the percent of families in the local area had positive effects on school-level relative inequality in Biology achievement. Thus, in local areas where there was a greater proportion of two-parent families, school-level relative inequality in Biology achievement decreased. Likewise, in local areas where there was a greater proportion of families in poverty, school-level relative inequality in Biology achievement decreased. Neither percent of two-parent families nor percent of families in poverty had an effect on school-level relative inequality in Biology achievement for WMHS students.

Relative Inequality in Quality of Employment and Relative Inequality in English I Achievement. Like relative inequality in Biology achievement, the covariance estimates for variance in school-level relative inequality in English I achievement between PUMAs was extremely small and non-significant, indicating there was no statistically significant variance between spatial areas in the amount of school-level relative inequality. The PUMA-level relative inequality in quality of employment, in the local area or neighboring area, had a significant effect on school-level relative inequality in English I achievement for three of the comparison groups (see Table 8).

Table 8. Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate.

	Black Females, More than High School Educated Parents (BFHS+)			Black Females, High School Educated or Less Parents (BFHS)			Black Males, More than High School Educated Parents (BMHS+)			Black Males, High School Educated or Less Parent (BMHS)		
	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2
Relative Inequality in Quality of Employment												
Local (PUMA) Area		0.171	0.068		-0.005	-0.006		-0.082	-0.049		-0.002	-0.002
Neighboring (PUMA) Areas		-0.003	-0.170		0.053 *	0.052 *		-0.006	0.066		-0.010	-0.015 *
Controls												
Percent of Two-Parent Families Local (PUMA) Area			0.012			0.012			0.006			0.019 *
Percent of Families in Poverty Local (PUMA) Area			0.017			0.012			0.022 **			0.029 ***
Intercept		-0.163	-1.376		-0.386	-1.398		-0.773 ***	-1.427 *		-1.286 ***	-3.105 ***
Covariance Estimates												
Between PUMAs	0.006	0.005	0.004	0.007	0.006	0.005	0.008	0.008	0.002	0.003	0.002	0.000
Schools Within PUMA	0.105 ***	0.106 ***	0.106 ***	0.098 ***	0.098 ***	0.099 ***	0.100 ***	0.100 ***	0.098 ***	0.106 ***	0.107 ***	0.101 ***
N	166	166	166	183	183	183	162	162	162	187	186	186

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

Table 8 (continued). Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate.

	White Females, More than High School Educated Parents (WFHS+)			White Females, High School Educated or Less Parents (WFHS)			White Males, High School Educated or Less Parent (WMHS)		
	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2
Relative Inequality in Quality of Employment									
Local (PUMA) Area		0.226 *	0.236		-0.008	0.004		0.037 *	0.043 *
Neighboring (PUMA) Areas		-0.193	-0.176		0.043	-0.014		-0.003	0.010
Controls									
Percent of Two-Parent Families Local (PUMA) Area			0.009 **			0.015 ***			0.005
Percent of Families in Poverty Local (PUMA) Area			0.003			0.015 **			0.001
Intercept		0.378 ***	-0.320		-0.086	-1.489 ***		-0.519 ***	-0.863 *
Covariance Estimates									
Between PUMAs	0.001	0.002	0.000	0.001	0.002	0.000	0.001	0.000	0.001
Schools Within PUMA	0.052 ***	0.052 ***	0.052 ***	0.078 ***	0.078 ***	0.076 ***	0.067 ***	0.067 ***	0.067 ***
N	319	319	319	301	301	301	298	298	298

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

There was a moderately-sized positive effect of two-tenths of a standard deviation of local area relative inequality in quality of employment on relative inequality in English I achievement for White females with parents with more than a high school education (WFHS+). With the introduction of family structure and family poverty factors, the effect of local area relative inequality in quality of employment was no longer significant. There was a small but significant positive effect of the percent of two-parent families for WFHS+ students, but this effect did not mediate the effect of local area relative inequality in quality of employment.

For Black females with parents with a high school education or less (BFMS) the neighboring area relative inequality in quality of employment had a positive effect on relative inequality in English I achievement. The effect, however, was fairly small at five hundredths of a standard deviation. There was no mediating effect of family structure or family poverty. There was an equally small positive effect of local area relative inequality on relative inequality in English I achievement for WMHS students. There was no mediating effect of family structure or family poverty for WMHS students.

Among Black males with parents with a high school education or less (BMHS) there was a negative effect of neighboring area relative inequality in quality of employment on relative inequality in English I achievement. The effect was extremely small and given that this effect was not significant until the mediating family factors were introduced into the model, it is likely that neighboring area relatively inequality in quality of employment reached significance by chance.

For four of the seven comparison groups, the percent of two-parent families and/or the percent of families in the local area had positive effects on school-level relative inequality

in English I achievement. As with relative inequality in Biology achievement, neither percent of two-parent families nor percent of families in poverty had an effect on school-level relative inequality in English I achievement for WMHS students, and in addition BFHS+ and BFHS students.

Relative Inequality in Earnings and Relative Inequality in Biology Achievement. There was a large positive effect of PUMA-level relative inequality in local earnings on school-level relative inequality in Biology achievement for WMHS and BMHS+ students. For WMHS students, the effect of a 2:1 increase in relative inequality in earnings was about a four-tenths of a standard deviation increase in the relative inequality in Biology achievement (see Table 9). The effect was about one-third of a standard deviation for BMHS+ students. These effects were by far the largest of any of the groups. For WMHS students, relative inequality in earnings does not appear to be mediated by the percent of two-parent families or percent of families in poverty. For BMHS+ students, relative inequality in earnings does appear to be mediated by the percent of families in poverty.

There was also a positive effect (approximately one-seventh of a standard deviation) of relative inequality in local earnings on relative inequality in Biology achievement for BMHS and WFHS students. Like WMHS students, relative inequality in earnings does not appear to be mediated by the percent of two-parent families or percent of families in poverty for WFHS students. Like BMHS+ students, relative inequality in earnings for BMHS students does appear to be mediated by the percent of two-parent families or percent of families in poverty, although neither effect reaches the level of statistical significance.

Table 9. Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate.

	Black Females, More than High School Educated Parents (BFHS+)			Black Females, High School Educated or Less Parents (BFHS)			Black Males, More than High School Educated Parents (BMHS+)			Black Males, High School Educated or Less Parent (BMHS)		
	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2
Relative Inequality in Quality of Employment												
Local (PUMA) Area		0.056	0.064		0.065	0.066		0.338 **	0.251 *		0.176 *	0.141
Neighboring (PUMA) Areas		0.068	0.113		-0.011	-0.011		0.346	0.065		0.094	0.029
Controls												
Percent of Two-Parent Families Local (PUMA) Area			0.010			0.025 **			0.001			0.007
Percent of Families in Poverty Local (PUMA) Area			0.025 **			0.026 ***			0.016 *			0.010
Intercept		-0.593 *	-1.576 *		-1.055 ***	-3.231 ***		-0.347 *	-0.884		-0.892 ***	-1.687 *
Covariance Estimates												
Between PUMAs	0.002	0.004	0.000	0.008	0.009	0.003	0.010	0.004	0.000	0.007	0.003	0.004
Schools Within PUMA	0.100 ***	0.100 ***	0.094 ***	0.076 ***	0.076 ***	0.760 ***	0.080 ***	0.082 ***	0.081 ***	0.070 ***	0.072 ***	0.071 ***
N	139	139	139	166	166	166	144	144	144	159	159	159

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

Table 9 (continued). Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate.

	White Females, More than High School Educated Parents (WFHS+)			White Females, High School Educated or Less Parents (WFHS)			White Males, High School Educated or Less Parent (WMHS)		
	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2
Relative Inequality in Quality of Employment									
Local (PUMA) Area		0.140	0.129		0.145 *	0.148 *		0.400 **	0.434 *
Neighboring (PUMA) Areas		0.103	0.281		0.280 *	0.294 *		0.035	0.117
Controls									
Percent of Two-Parent Families Local (PUMA) Area			0.011 *			0.011 *			0.003
Percent of Families in Poverty Local (PUMA) Area			0.002			0.010 *			-0.001
Intercept		0.151	-0.480		0.127	-0.780 *		-0.329 *	-0.464
Covariance Estimates									
Between PUMAs	0.004	0.004	0.002	0.005	0.003	0.001	0.001	0.000	0.000
Schools Within PUMA	0.059 ***	0.059 ***	0.059 ***	0.070 ***	0.070 ***	0.071 ***	0.074 ***	0.073 ***	0.073 ***
N	293	293	293	268	268	268	264	264	264

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

For BFHS+, BFHS, and WFHS+ students, there was no significant effect of relative inequality in earnings on relative inequality in Biology achievement. For these groups, the percent of two-parent families and/or the percent of families in the local area had positive effects on school-level relative inequality in Biology achievement.

Relative Inequality in Earnings and Relative Inequality in English I Achievement. For four out of the seven comparison groups, the PUMA-level relative inequality in earnings had no effect on relative inequality in English I achievement (see Table 10). There was a relatively large positive effect (approximately one-quarter of a standard deviation) of relative inequality in local earnings on relative inequality in English I achievement for BMHS students. Like the results for relative inequality in earnings and Biology achievement, with relative inequality in earnings in the equation alone, relative inequality in local earnings had a positive effect which was mediated (and no longer significant) with the introduction of the controls for local family structure and families in poverty.

There was a positive one-tenth of a standard deviation effect of local area relative inequality in earnings on relative inequality in English I achievement for BFHS students. There was no mediating effect of local family structure or families in poverty.

Surprisingly, PUMA-level relative inequality in earnings had a negative effect on school-level relative inequality in English I achievement for BMHS+ students. The size of this negative effect was fairly large at nearly one-third of a standard deviation. It may be that for these students that an overall decrease in relative inequality in earnings is associated with worsening job prospects for Black and White males with education beyond high school. In

Table 10. Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate.

	Black Females, More than High School Educated Parents (BFHS+)			Black Females, High School Educated or Less Parents (BFHS)			Black Males, More than High School Educated Parents (BMHS+)			Black Males, High School Educated or Less Parent (BMHS)		
	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2
Relative Inequality in Quality of Employment												
Local (PUMA) Area		0.041	0.037		0.109 *	0.113 *		-0.095	-0.300 *		0.240 **	0.126
Neighboring (PUMA) Areas		-0.048	0.002		0.031	0.039		0.388	-0.079		0.013	-0.113
Controls												
Percent of Two-Parent Families Local (PUMA) Area			0.010			0.009			0.012			0.016 *
Percent of Families in Poverty Local (PUMA) Area			0.015 *			0.012			0.030 **			0.024 **
Intercept		-0.243	-1.132		-0.377	-1.160		-0.511 *	-2.262 **		-0.790 **	-2.642 **
Covariance Estimates												
Between PUMAs	0.006	0.007	0.005	0.007	0.006	0.005	0.008	0.009	0.000	0.003	0.000	0.000
Schools Within PUMA	0.105 ***	0.106 ***	0.106 ***	0.098 ***	0.098 ***	0.098 ***	0.100 ***	0.099 ***	0.098 ***	0.106 ***	0.105 ***	0.101 ***
N	166	166	166	185	185	185	162	162	162	187	187	187

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

Table 10 (continued). Hierarchical Linear Modeling Estimates of School-Level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on PUMA-Level Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate.

	White Females, More than High School Educated Parents (WFHS+)			White Females, High School Educated or Less Parents (WFHS)			White Males, High School Educated or Less Parent (WMHS)		
	One-Way ANOVA	1	2	One-Way ANOVA	1	2	One-Way ANOVA	1	2
Relative Inequality in Quality of Employment									
Local (PUMA) Area		0.010	-0.036		-0.036	-0.028		-0.090	-0.072
Neighboring (PUMA) Areas		-0.031	-0.005		-0.014	0.000		0.307	0.354
Controls									
Percent of Two-Parent Families Local (PUMA) Area			0.011 **			0.015 ***			0.003
Percent of Families in Poverty Local (PUMA) Area			0.007 *			0.014 **			0.000
Intercept		0.366	-0.513		-0.249	-1.498 **		-0.470 **	-0.617
Covariance Estimates									
Between PUMAs	0.001	0.002	0.000	0.001	0.002	0.000	0.001	0.001	0.001
Schools Within PUMA	0.052 ***	0.052 ***	0.052 ***	0.078 ***	0.078 ***	0.076 ***	0.067 ***	0.067 ***	0.067 ***
N	319	319	319	301	301	301	298	298	298

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

such a situation, the relative inequality may be decreasing, but so are the family resources. Decreases in family resources are likely to lead to decreasing English I achievement since success is more dependent on family processes relative to Biology.

Ordinary Least Squares Models

Relative Inequality in Quality of Employment and Relative Inequality in Biology Achievement. The ordinary least squares estimates of PUMA-level relative inequality in Biology achievement relative to WMHS+ students on PUMA-level relative inequality in quality of employment, community family structure, and family poverty rate are presented in Table 11. Two regression equations are shown for each of the seven race, class, and gender comparisons. Equation one for each group shows the effect of the primary theoretical variables of interest, local and neighboring area relative inequality in quality of employment. Equation two for each group shows the effect of the relative inequality in quality of employment with controls for the mediating family factors of percent of two-parent families and percent of families in poverty.

There were three groups for which the relative inequality in quality of employment had a significant effect on relative inequality in Biology achievement: 1) White males with a parent with a high school education or less (WMHS); 2) Black females with a parent with a high school education or less (BFHS); and 3) Black females with parents with education beyond high school (BFHS+). Among WMHS students the relative inequality in quality of employment in both local and neighboring areas had an effect on relative inequality in Biology achievement. This effect was positive and in the expected direction for the neighboring area relative inequality in quality of employment, meaning that as the relative inequality in quality of employment increased so did the relative inequality in Biology

achievement. More specifically, if the relative inequality in employment in neighboring areas decreased by a factor of 2 to 1, the relative inequality in Biology achievement was expected to decrease by 0.113 standard deviations or approximately seven percent, holding all other factors constant. When the controls for family structure and family rate of poverty in the local community were introduced, there was a mediating effect with the effect of neighboring area relative inequality in quality of employment being reduced to 0.098 standard deviations or approximately six percent, holding all other factors constant. Local area relative inequality in quality of employment had a negative, but small effect on relative inequality in Biology achievement. Given the small size of the effect, it may be that this effect reached statistical significance by chance. An alternative possibility for this finding is that WMHS students are making relative comparisons. It may be that WMHS students are making a relative comparison between local employment prospects and employment prospects in neighboring areas. If WMHS students believe their future employment is more tightly tied to the local labor market and it compares less favorably to neighboring employment markets, they may be making an evaluation of schooling, and specifically Biology achievement, as less important because of the local labor market comparing less favorably to the neighboring labor market.

For WMHS students, an increase in the percent of two-parent families resulted in a decrease in the relative inequality in Biology achievement consistent with previous research that has found a positive effect of two-parent families on achievement. An increase in the family poverty rate also resulted in a decrease in the relative inequality in Biology achievement. Or in other words, as the percentage of families in poverty decreased, the

Table 11. Ordinary Least Squares Estimates of PUMA-level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on PUMA-level Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate.

	Black Females, More than High School Educated Parents (BFHS+)		Black Females, High School Educated or Less Parents (BFHS)		Black Males, More than High School Educated Parents (BMHS+)		Black Males, High School Educated or Less Parents (BMHS)	
	1	2	1	2	1	2	1	2
Relative Inequality in Quality of Employment								
Local (PUMA) Area	0.038	0.039	-0.019 **	-0.021 ***	-0.042	-0.040	0.000	0.000
Neighboring (PUMA) Areas	-0.228	-0.391 **	-0.018	-0.031	-0.143	-0.142	0.009	0.004
Controls								
Percent of Two-Parent Families Local (PUMA) Area		0.020 **		0.026 ***		-0.006		0.030 **
Percent of Families in Poverty Local (PUMA) Area		0.026 ***		0.022 ***		-0.004		0.027 **
Intercept	-0.806 ***	-2.698 ***	-1.439 ***	-3.682 ***	-0.973 ***	-0.480	-1.201 ***	-3.765 ***
R-Square	0.077	0.400 **	0.232 *	0.508 ***	0.042	0.058	0.018	0.289 *
Adjusted R-Square	0.026	0.329	0.187	0.446	-0.013	-0.056	-0.040	0.200
N	39	39	37	37	38	38	37	37

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

Table 11 (continued). Ordinary Least Squares Estimates of PUMA-level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on PUMA-level Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate.

	White Females, More than High School Educated Parents (WFHS+)		White Females, High School Educated or Less Parents (WFHS)		White Males, High School Educated or Less Parents (WMHS)	
	1	2	1	2	1	2
Relative Inequality in Quality of Employment						
Local (PUMA) Area	0.031	0.040	-0.020	-0.022	-0.041 *	-0.039 *
Neighboring (PUMA) Areas	-0.037	-0.036	0.041	-0.050	0.113 ***	0.098 **
Controls						
Percent of Two-Parent Families Local (PUMA) Area		0.009 *		0.014 **		0.003
Percent of Families in Poverty Local (PUMA) Area		0.004		0.021 ***		0.004
Intercept	-0.069 ***	-0.791 *	-0.598 ***	-2.112 ***	-0.420 ***	-0.704
R-Square	0.002	0.206	0.016	0.316 **	0.286 **	0.301 *
Adjusted R-Square	-0.052	0.116	-0.037	0.238	0.247	0.221
N	40	40	40	40	40	40

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

relative inequality in Biology achievement increased. The percent of variation explained in both equations was fairly significant.

For BFHS students, it was the local relative inequality in employment that was significant. The effect, however, was not in the direction expected. For this group, as the relative inequality in quality of employment decreased, the relative inequality in Biology achievement increased. The amount of increase was about one percent for each decrease of 2 to 1 in the relative inequality in quality of employment. The negative effect of relative inequality in quality of employment increased slightly with the introduction of the controls in equation two. As with WMHS students, an increase in the percent of two-parent families or an increase in the percent of families in poverty both led to a decrease in the relative inequality in Biology achievement. The relatively large increase in r-square from equation one to equation two indicates that these control variables explain a substantial portion of the variation in relative inequality in Biology achievement. The significance of these variables is also seen by comparing the size of the effects in equation two for BFHS students with equation two for WMHS students. The control variables, however, did not have a mediating effect on the relative inequality in quality of employment on the relative inequality in Biology achievement.

The results for BFHS+ students were similar to BFHS students, except that it was the neighboring area relative inequality in quality of employment that was significant. Since the effect of neighboring area inequality was only significant after the introduction of the family structure and family poverty variables, it is likely that significance was reached by chance.

For the other four groups, relative inequality in quality of employment did not have significant effects on inequality in Biology achievement. Percent of two-parent families and

percent of families had positive effects, however, on relative inequality in Biology achievement for both WFHS and BMHS students.

Relative Inequality in Quality of Employment and Relative Inequality in English I Achievement. The pattern of results for the relative inequality in English I achievement regressed on the inequality in quality of employment, community family structure, and family poverty rate were somewhat different from the regression of relative inequality in Biology achievement on these factors (see Table 12). Like the results for Biology, there was a significant relationship between quality of employment and relative inequality in English I for the BFHS+ and BFHS groups. For BFHS+ students, the relative inequality in the local quality of employment was significant, in contrast to the results for Biology where it was the neighboring area quality of employment that was significant. For both Biology and English I the sign of the coefficients for inequality in local and neighboring quality of employment were in the same direction, even if they were not always significant. Relative inequality in local quality of employment had a positive effect on relative inequality in English I achievement, meaning that as inequality in quality of employment increased so did the relative inequality in English I achievement. The effect size for a 2:1 increase in the inequality in quality of employment was 0.143, or about a four percent increase in the relative inequality in English I achievement.

Like the Biology results, inequality in local quality of employment had a relatively small negative effect on inequality in English I achievement for BFHS students that was likely due to chance. There was a very small negative effect of local area relative inequality on relative inequality in English I achievement for BMHS students. The effect was so small that it likely due to chance. The results for WMHS students were also similar to the results

Table 12. Ordinary Least Squares Estimates of PUMA-level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on PUMA-level Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate.

	Black Females, More than High School Educated Parents (BFHS+)		Black Females, High School Educated or Less Parents (BFHS)		Black Males, More Than High School Educated Parents (BMHS+)		Black Males, High School Educated or Less Parents (BMHS)	
	1	2	1	2	1	2	1	2
Relative Inequality in Quality of Employment								
Local (PUMA) Area	0.120 *	0.143 **	-0.011	-0.016 *	-0.034	-0.020	-0.002 *	-0.002 *
Neighboring (PUMA) Areas	-0.016	-0.027	0.034	0.012	0.062	0.107	0.007	0.001
Controls								
Percent of Two-Parent Families Local (PUMA) Area		0.018 **		0.030 ***		0.030 ***		0.032 ***
Percent of Families in Poverty Local (PUMA) Area		0.014 *		0.024 ***		0.031 ***		0.029 ***
Intercept	-0.161 *	-1.661 **	-0.536 **	-3.201 ***	-0.661 ***	-3.193 ***	-1.084 ***	-3.815 ***
R-Square	0.151	0.329 **	0.080	0.457 ***	0.030	0.498 ***	0.110	0.524 ***
Adjusted R-Square	0.104	0.250	0.027	0.392	-0.026	0.437	0.058	0.465
N	39	39	38	38	38	38	37	37

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

Table 12 (continued). Ordinary Least Squares Estimates of PUMA-level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on PUMA-level Relative Inequality in Quality of Employment, Community Family Structure, and Family Poverty Rate.

	White Females, More than High School Educated Parents (WFHS+)		White Females, High School Educated or Less Parents (WFHS)		White Males, High School Educated or Less Parents (WMHS)	
	1	2	1	2	1	2
Relative Inequality in Quality of Employment						
Local (PUMA) Area	0.110	0.092	-0.054	-0.047	-0.006	0.000
Neighboring (PUMA) Areas	0.033	0.023	0.104 *	0.032	0.058 *	0.089 *
Controls						
Percent of Two-Parent Families Local (PUMA) Area		0.008 **		0.016 ***		0.003
Percent of Families in Poverty Local (PUMA) Area		0.004		0.018 **		-0.003
Intercept	0.371 ***	-0.291	-0.102 **	-1.690 ***	-0.503 ***	-0.548
R-Square	0.042	0.273 *	0.096	0.380 **	0.095	0.139
Adjusted R-Square	-0.010	0.190	0.048	0.309	0.046	0.041
N	40	40	40	40	40	40

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

for WMHS students' Biology achievement except that only neighboring area relative inequality in quality of employment was significant. Additionally, there was no mediating effect of family structure or family poverty.

For WFHS students, neighboring area relative inequality in quality of employment had a significant positive effect on relative inequality in English I achievement. The effect was mediated, and no longer significant, once percent of two-parent families and percent of families in poverty were introduced.

For all groups, except WMHS students, the local percent of two-parent families and percent of families in poverty had significant positive effects on relative inequality in English I achievement. These were the only significant effects for the BMHS+ students.

Relative Inequality in Earnings and Relative Inequality in Biology Achievement. There was a large positive effect of relative inequality in local earnings on relative inequality in Biology achievement for WMHS students relative to WMHS+ students. The effect of a 2:1 increase in local area relative inequality in earnings was about a half a standard deviation increase in the relative inequality in Biology achievement (see Table 13). This effect was by far the largest of any of the groups. For WMHS students, this effect did not appear to be mediated by the percent of two-parent families or percent of families in poverty. There was also a positive effect of local area relative inequality in earnings on relative inequality in Biology achievement for WFHS+ and BMHS+ students, also without a mediating effect of percent of two-parent families or percent of families in poverty. For WFHS+ students the positive effect of local area relative inequality in earnings was approximately one-sixth of a standard deviation; for BMHS+ students the positive effect was one-quarter to one-third of a standard deviation.

Table 13. Ordinary Least Squares Estimates of PUMA-level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on PUMA-level Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate.

	Black Females, More than High School Educated Parents (BFHS+)		Black Females, High School Educated or Less Parents (BFHS)		Black Males, More than High School Educated Parents (BMHS+)		Black Males, High School Educated or Less Parents (BMHS)	
	1	2	1	2	1	2	1	2
Relative Inequality in Earnings								
Local (PUMA) Area	0.198 *	0.169 *	0.089	0.065	0.237 *	0.329 *	0.232 *	0.105
Neighboring (PUMA) Areas	0.132	0.173	-0.005	0.000	0.016	0.140	0.182	0.041
Controls								
Percent of Two-Parent Families Local (PUMA) Area		0.018 **		0.020 *		-0.015 *		0.028 **
Percent of Families in Poverty Local (PUMA) Area		0.018 **		0.017 *		-0.011		0.025 **
Intercept	-0.271	-1.834 **	-0.989 ***	-2.699 ***	-0.670 **	0.689	-0.701 **	-3.421 ***
R-Square	0.156 *	0.352 **	0.080	0.242	0.098	0.176	0.170 *	0.377 **
Adjusted R-Square	0.109	0.276	0.028	0.150	0.046	0.077	0.123	0.303
N	39	39	38	38	38	38	39	39

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

Table 13 (continued). Ordinary Least Squares Estimates of PUMA-level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education on PUMA-level Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate.

	White Females, More than High School Educated Parents (WFHS+)		White Females, High School Educated or Less Parents (WFHS)		White Males, High School Educated or Less Parents (WMHS)	
	1	2	1	2	1	2
Relative Inequality in Earnings						
Local (PUMA) Area	0.157 *	0.163 *	0.092	0.107 *	0.453 ***	0.454 **
Neighboring (PUMA) Areas	0.168	0.293	0.164	0.156	0.187	0.195
Controls						
Percent of Two-Parent Families Local (PUMA) Area		0.009 **		0.014 **		0.002
Percent of Families in Poverty Local (PUMA) Area		0.002		0.015 ***		0.001
Intercept	0.233	-0.297	-0.210	-1.410 **	-0.255 *	-0.378
R-Square	0.096	0.318 **	0.081	0.355 **	0.375 ***	0.378 **
Adjusted R-Square	0.047	0.240	0.031	0.281	0.341	0.307
N	40	40	40	40	40	40

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

There was a positive effect of relative inequality in local earnings on inequality in Biology achievement for BFHS+ and BMHS students (about one-fifth of a standard deviation), with both having these effects mediated by the percent of two-parent families and percent of families in poverty. This pattern appeared to be the same for BFHS students, except that neither equation reached significance. For all groups except WMHS students, the percent of two-parent families and/or the percent of families in poverty had a positive effect on the relative inequality in Biology achievement.

Relative Inequality in Earnings and Relative Inequality in English I Achievement. Relative inequality in earnings had no effect on relative inequality in English I achievement for White students, but did have a positive effect for Black students (see Table 14). For BMHS, BFHS+, and BFHS students, the results were similar to the Biology results. With inequality in earnings in the equation alone, local earnings inequality had a positive effect. This effect was mediated with the introduction of the controls for local family structure and families in poverty. This pattern was the same for BMHS+ students, unlike the Biology results for BMHS+ students, where there was no mediating effect of family structure or families in poverty. The positive effect of local area relative inequality in earnings on relative inequality in English I achievement for BFHS+, BMHS+, and BMHS students was about one-fifth of a standard deviation for each group.

Like the relative inequality in earnings and relative inequality in Biology results, the percent of two-parent families and/or the percent of families had positive effects on the relative inequality in English I achievement for all groups except WMHS students.

Table 14. Ordinary Least Squares Estimates of PUMA-level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on PUMA-level Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate.

	Black Females, More than High School Educated Parents (BFHS+)		Black Females, High School Educated or Less Parents (BFHS)		Black Males, More than High School Educated Parents (BMHS+)		Black Males, High School Educated or Less Parents (BMHS)	
	1	2	1	2	1	2	1	2
Relative Inequality in Earnings								
Local (PUMA) Area	0.159 *	0.139	0.105	0.111 *	0.221	0.059	0.259 **	0.141
Neighboring (PUMA) Areas	-0.100	-0.073	0.101	0.031	0.127	-0.164	0.104	-0.027
Controls								
Percent of Two-Parent Families Local (PUMA) Area		0.013		0.026 ***		0.030 ***		0.026 ***
Percent of Families in Poverty Local (PUMA) Area		0.013		0.022 ***		0.030 ***		0.024 ***
Intercept	-0.139	-1.213	-0.200	-2.510 ***	-0.466 *	-3.308 ***	-0.606 **	-3.119 ***
R-Square	0.122	0.225	0.155 *	0.454 ***	0.092	0.484 ***	0.229 **	0.476 ***
Adjusted R-Square	0.073	0.133	0.108	0.389	0.040	0.422	0.186	0.415
N	39	39	39	39	38	38	39	39

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

Table 14 (continued). Ordinary Least Squares Estimates of PUMA-level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education on PUMA-level Relative Inequality in Earnings, Community Family Structure, and Family Poverty Rate.

	White Females, More than High School Educated Parents (WFHS+)		White Females, High School Educated or Less Parents (WFHS)		White Males, High School Educated or Less Parents (WMHS)	
	1	2	1	2	1	2
Relative Inequality in Earnings						
Local (PUMA) Area	-0.029	-0.062	-0.043	-0.026	-0.034	-0.016
Neighboring (PUMA) Areas	-0.001	-0.006	-0.054	-0.059	0.261	0.304
Controls						
Percent of Two-Parent Families Local (PUMA) Area		0.009 ***		0.017 ***		0.002
Percent of Families in Poverty Local (PUMA) Area		0.007 *		0.017 ***		0.000
Intercept	0.348 *	-0.455	-0.385	-1.826 ***	-0.514 ***	-0.588
R-Square	0.005	0.278 *	0.012	0.356 **	0.045	0.052
Adjusted R-Square	-0.049	0.195	-0.041	0.282	-0.007	-0.057
N	40	40	40	40	40	40

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed tests)

In this chapter I presented descriptive statistics and regression results to test the hypotheses that greater equality in quality of employment and equality in earnings is related to greater equality in achievement. The hypotheses were supported for some race, class, and gender groups and in some subjects, but not all. In the next chapter I discuss the interpretation of these results and future implications for research.

CHAPTER 5

SUMMARY AND CONCLUSION

In Chapter 2 I specified a theoretical model that linked community context to inequality in educational achievement. I addressed one aspect of this theoretical model asking, is there a relationship between race, class, and gender inequality in the employment opportunity structure and race, class, and gender inequality in educational achievement? This study addressed some shortcomings of previous contextual studies of inequality in educational achievement. First, the study examined a possible cause of inequality in educational achievement, employment opportunity structure, rather than aggregations of effects, such as percent of families in poverty, that result from other conditions. Second, this study was implemented in a manner consistent with more recent theoretical understandings of inequality, which specify the simultaneous nature of race, class, and gender inequality. Third, the study addressed the contextual nature of inequality, linking inequality in labor market conditions in a spatial area to inequality in educational achievement in the same area. In this chapter I present an overall summary of the results and evaluate the hypotheses followed by a set of conclusions.

SUMMARY OF RESULTS

I hypothesized that the greater the equality among race, class, and gender groups in quality of employment and in earnings in the local community and in neighboring communities, the greater the equality of achievement among race, class, and gender groups on high school language arts and science tests in the local community. *I found the strongest support for the hypothesis that the greater the equality among race, class, and gender groups in earnings in the local community, the greater the equality among race, class, and gender groups in*

educational achievement (Hypothesis 2A). Table 15 shows the groups for which there was a significant positive relationship between local area (PUMA-level) relative inequality in earnings and relative inequality in Biology achievement measured at the school level and the PUMA level. The positive effect of local area relative inequality in earnings on relative inequality in Biology achievement is consistent with students evaluating their employment opportunities in their local frame of reference and adjusting their school performance to match those opportunities as described by MacLeod (1995) and Willis (1977). The fact that there was a positive effect of local area relative inequality in earnings on relative inequality in Biology achievement for some groups at the PUMA level that were different from the groups at the school level likely indicates that students are not making comparisons to other students in the school, but to their employment opportunities in the local area. It is also possible that teachers adjust their expectations for students based on evaluation of their students' employment opportunities. These differences in expectations on the part of students and teachers may be played out in classroom behavior as well as through tracking. Students or teachers may select different Biology courses (e.g., general Biology versus honors or Advanced Placement Biology) based on expectations that would affect the level of achievement.

For White students, relative inequality in Biology achievement appears to be a school level process. This conclusion is suggested by the lack of a mediating effect of family structure or family poverty for any of the White student groups. For Black students, there does appear to be a mediating effect of family structure or family poverty in addition to any school–level processes.

Table 15. Summary of Significant Effects PUMA-Level Relative Inequality in Earnings on School-Level and PUMA-Level Relative Inequality in Biology Achievement Relative to White Males with a Parent with More than High School Education.

	School-Level Relative Inequality			PUMA-Level Relative Inequality		
Inequality Between White Males with More than High School Educated Parents Relative to:	Local Area	Neighboring Area	Mediated by Family Structure or Family Poverty	Local Area	Neighboring Area	Mediated by Family Structure or Family Poverty
Black Females, More than High School Educated Parents (BFHS+)				+		Yes
Black Females, High School Educated or Less Parents (BFHS)						
Black Males, More than High School Educated Parents (BMHS+)	+		Yes	+		No
Black Males, High School Educated or Less Parents (BMHS)	+		Yes	+		Yes
White Females, More than High School Educated Parents (WFHS+)				+		No
White Females, High School Educated or Less Parents (WFHS)	+		No			
White Males, High School Educated or Less Parents (WMHS)	+		No	+		No

A plus sign (+) indicates a significant positive effect ($p<0.05$, one-sided).

Table 16. Summary of Significant Effects of PUMA-Level Relative Inequality in Earnings on School-Level and PUMA-Level Relative Inequality in English I Achievement Relative to White Males with a Parent with More than High School Education.

	School-Level Relative Inequality			PUMA-Level Relative Inequality		
Inequality Between White Males with More than High School Educated Parents Relative to:	Local Area	Neighboring Area	Mediated by Family Structure or Family Poverty	Local Area	Neighboring Area	Mediated by Family Structure or Family Poverty
Black Females, More than High School Educated Parents (BFHS+)				+		Yes
Black Females, High School Educated or Less Parents (BFHS)	+		No	+		No
Black Males, More than High School Educated Parents (BMHS+)				+		Yes
Black Males, High School Educated or Less Parents (BMHS)	+		Yes	+		Yes
White Females, More than High School Educated Parents (WFHS+)						
White Females, High School Educated or Less Parents (WFHS)						
White Males, High School Educated or Less Parents (WMHS)						

A plus sign (+) indicates a significant positive effect ($p<0.05$, one-sided).

The positive effect of local area relative inequality in earnings on relative inequality in Biology achievement was strongest for Black and White lower class status males (approximately one-quarter and one-half a standard deviation respectfully), and was consistent when relative inequality in Biology achievement was measured at the school level and the PUMA level. Local area relative inequality in earnings had a positive effect on school-level and PUMA-level relative inequality in Biology achievement for BMHS+ students as well. For BMHS+ students, however, there was a mediating effect of family poverty on school-level relative inequality in Biology, but not for PUMA-level relative inequality in Biology.

The results for the effect of local area relative inequality in earnings on relative inequality in English I achievement were even more consistent than for relative inequality in Biology (see Table 16). There were positive effects of PUMA-level relative inequality in earnings on school-level and PUMA-level relative inequality in English I achievement for Black students. Like the results for relative inequality in Biology, these results suggest that students and/or teachers adjust their expectations based on local area employment opportunities. The effect on school-level and PUMA-level relative inequality in English I was consistent for lower class status Black females and males. The fact that there were two additional groups for which there was a positive effect of local area relative inequality in earnings on relative inequality in English I achievement at the PUMA-level compared to the school-level suggests that students are not just making comparisons to other students in the school, but to their employment opportunities in the local area.

Unlike the other groups of Black students, there was no mediating effect of family structure or family poverty on English I achievement of BFHS students. Family structure and family poverty were significantly positively related to PUMA-level relative inequality in English I achievement, and significantly increased the explained variance. This indicates that the effects of local area relative inequality were nearly all direct effects for BFHS students. It may be that BFHS students believe their employment prospects are more tightly tied to the local area compared to other Black students, which may be true considering that these students are more often single parents limited in the employment opportunities they can seek because of the need to rely on support from others.

There was no effect of relative inequality in earnings on relative inequality in English I achievement for White students. There were positive effects of family structure and family poverty for White female students but not for WMHS students. This finding seems to indicate that for White females relative inequality compared to WMHS+ students in English I achievement is much more dependent on family factors. These results also suggest that relative inequality between WMHS and WMHS+ students is dependent on other processes, such as tracking, that were not measured in these analyses.

I had expected that inequality in earnings would have a stronger effect on inequality in educational achievement for Black males and females and lower class status White females and White males. This was based largely on Beck and Colclough's (1988) finding that the returns to education for Black females and males and White females were more dependent on the local labor market, and Willis' (1977) and MacLeod's (1995) case studies of lower class White males. This expectation was generally supported for Black students for Biology and English I achievement. For White students, this expectation was generally

supported for Biology achievement but not for English I achievement. These differences between Black and Whites students in Biology and English I achievement may be due to differences in the nature of these two subjects. Biology achievement is likely more dependent on high school processes than English I achievement. School processes would include student effort, quality of instruction, and tracking. If Biology achievement is more dependent on school processes, then factors that affect Biology achievement will likely affect both Black and White students, as was found in these results.

On the other hand, it is much more likely that students will have developed a foundation for English achievement over the course of elementary and middle school and in their family context, making it less dependent on high school processes than Biology achievement. Additionally, White students may have an advantage over Black students in English because presumably the accepted rules of the English language are dominated by White culture. Therefore, White students' achievement in English I may be less dependent on factors that affect student effort or other school-level processes. On the other hand, Black students may be faster to reject the conventions of White-dominated English language if they see little relevance for future employment.

It is less clear why there was no effect of relative inequality in earnings on relative inequality in Biology achievement of BFHS students. Theory suggests that these students do not make a direct evaluation of the local earnings inequality. BFHS students may believe their employment opportunities will be the same no matter what happens (i.e., limited to lower status positions and earnings) and therefore they do not change their school behavior based on changes in the relative inequality of earnings in the local area. It may be that the

models in this study did not include measures of other processes that are more important for this group of students.

There was little support for the hypothesis that the greater the equality among race, class, and gender groups in quality of employment in the local community the greater the equality among race, class, and gender groups in educational achievement (Hypothesis 1A). With the exception of WMHS students, there was no consistent relationship between relative inequality in quality of employment and relative inequality in Biology or English I achievement at the school or PUMA level. For WMHS students there was a consistent positive effect of local area relative inequality in quality of employment on relative inequality in English I achievement at the school and PUMA level. These results seem to generally indicate that quality of employment is not as effective a measure of relative inequality as earnings. The ineffectiveness of quality of employment as a measure of relative inequality may have also been affected by the measure of class status being at a low level of educational status (high school or less versus more than high school education) while most of the jobs defined as high quality in this measure require a college education. Although inclusion of craftworker jobs in the definition of high quality jobs did not significantly change any of the results (analyses not presented here). Most likely the occupational categories were too broad and heterogeneous to capture the actual inequality experienced by workers.

There was little support for the hypotheses that the greater the equality among race, class, and gender groups in quality of employment or in earnings in neighboring communities the greater the equality among race, class, and gender groups in educational achievement (Hypotheses 2A and 2B). Support for the hypotheses was limited to PUMA-

level relative inequality in achievement for WFHS and WMHS students. I had expected that that any effect of neighboring area relative inequality in quality of employment or in earnings would be stronger for White females and males because they would be better able to take advantage of employment opportunities in neighboring areas because of family support (more two-parent families) and because of having better access to transportation than Black workers. It was not surprising that there was little support for these hypotheses since the spatial area representing the local area (the modified PUMA) represented a fairly large (more than one county) area in most cases, and the neighboring area then represented an even larger area. It would not be surprising then that students may not have any knowledge of or be affected by employment opportunities in a neighboring area given these measures.

For most groups, the community family structure and/or the family poverty rate were significant or the only significant positive effects on equality in educational achievement. The positive relationship between the percent of two-parent families and equality in achievement in Biology and English I is consistent with previous research that found a negative effect of the percent of single-parent families on school-level achievement (Caldas and Bankston 1999). The positive relationship between the family poverty rate and inequality in achievement indicates that as the family poverty rate increased the relative inequality in achievement decreased. This finding is consistent with Roscigno's (1996) finding that the family poverty rate had an overall depressing effect on achievement. From another perspective this finding indicates that inequality in educational achievement was greatest in the most affluent areas (i.e., areas with the least poverty). Thus, while more affluent areas are generally associated with higher educational achievement, these areas are also the areas likely to have the highest inequality in achievement. This finding is also

consistent with research which found that the higher the proportion of students with higher socioeconomic status backgrounds in a school, the greater the pressure for exclusive tracking, which in turn was associated with greater inequality in achievement (Gamoran 1992; Kilgore 1991).

CONCLUSIONS

These results suggest generally that the relative inequality in earnings is related to inequality in educational achievement in Biology for Black and White students and for Black students in English I. The significance of these results is not that differences in the *level* of earnings are an important factor in inequality in educational achievement. As noted earlier, the relationship between higher socioeconomic status and higher educational achievement has been well documented in the literature. The significance of these results is that *relative inequality* in earnings in a defined spatial area had a significant positive relationship with relative inequality in educational achievement in that same area.

It is best to think of this finding in terms of an illustration. If community A and community B have the same high average earnings relative to other areas, both communities would be expected to have high average achievement relative to other areas as well. If there is more equality in earnings within community A compared to community B, however, these results indicate I can expect greater equality in achievement in community A than in community B, for Biology and other more school-dependent subjects (e.g., algebra) for Black and White students, and for Black students alone in English I and other less school-dependent subjects (e.g., U.S. History). Thus, while two spatial areas may overall have higher average earnings and higher average achievement, they may have very different rates of inequality in achievement.

Human capital has been commonly given as a reason for inequality in earnings and other employment characteristics. Racial and gender inequality in earnings, however, exists even after taking into account differences in human capital and preferences (Tomaskovic-Devey 1993). This study controlled for potentially important human capital differences through the assignment of class status. If differences in human capital alone produced inequality, then I would have expected the relative inequality in earnings for Black females with high school education or less, for example, to have little variation across different spatial areas. What this study found was relative inequality in earnings varied across geographic areas even when race, class (human capital), and gender were controlled, and that the variation in relative inequality was enough that it had a positive relationship with educational achievement for two high school subjects.

Another important finding of this study was the mediating effect of percent of families in poverty for most groups of Black students on Biology and English I achievement. This study found that in local areas where there was a greater proportion of families in poverty, school-level and local area relative inequality in Biology and English I achievement decreased. This finding suggests a more general sociological principle: where there are more resources, there is greater inequality. An area high in poverty is indicative of an area in which there are few resources—specifically, jobs or jobs that pay well. An area that is low in poverty is indicative of an area in which there are more resources—jobs or well-paying jobs. While an improvement in jobs or well-paying jobs could result in "all boats rising" (i.e., everyone's relative economic position improving equally), these results suggest that this does not happen. Instead, some people benefit more than others do. It would be like boats being able to rise to many different levels in a deep lake. If the water is 10 feet deep the best

off and worst off boats are all within ten feet of each other. If the water is 100 feet deep all boats might be higher than ten feet, but the best off and the worst off can still be 90 feet apart. Given that the mediating effect of percent of families in poverty affected Black students, but not White students, indicates that Whites are the beneficiaries of improved economic situations (i.e., less poverty). This process is consistent with Tilly's (1998) notion of opportunity hoarding by more powerful actors. Opportunity hoarding is facilitated by powerful people making use of status identities to make claims for resources against the claims of other people that do not share the same status identities. This is exactly what happens with tracking. As the proportion of students with higher socioeconomic status backgrounds in a school increases, the greater the pressure for exclusive tracking (i.e., opportunity hoarding), with the result being greater inequality in achievement (Gamoran 1992; Kilgore 1991). Similarly, the higher the class status of a neighborhood, as measured by income and parental education, the greater the difference between lower elementary males and females in mathematics achievement (Entwisle et al. 1994). While less obviously an example of opportunity hoarding, it is an example of an increase in resources (in this case, neighborhood socioeconomic status), providing more benefits to one group than another.

It is likely that these spatial differences in inequality of earnings were related to the types of industry in the community, the power of labor relative to employers, relative concentration of minority racial groups, and social support for equality, as has been found previously (Beggs 1995; Beggs et al 1997; Parcel 1979; Tomaskovic-Devey 1987; Tomaskovic-Devey and Roscigno 1996). This suggests that greater equality in earnings may be best realized through economic development policies that support industries with more equitable wages, laws which provide labor rights that balance the power of workers vis-a-vis

employers, and through enforcement of equal employment laws. These latter two strategies could be implemented much more quickly, and potentially have benefits across an entire state, which would be more difficult to realize with changes in economic development policies.

Local and state policy makers should acknowledge these strategies as not only important for increased equality of earnings, but for the potential impact on reducing inequality in educational achievement. Policy makers should be especially encouraged by a) the impact of local relative inequality in earnings on Black students' achievement in both Biology and English; and b) the strength of this relationship for Black male students in particular. The educational achievement gap between Black and White students is larger than the gap between White students and other racial/ethnic groups. Closing such a large gap will require a significant effort. The findings of this study indicate that while policy makers may be appropriately focused on the importance of policies that directly affect the classroom and the school in reducing the inequality in achievement, they need to consider the impact of policies that affect the larger community within which families, schools, and students exist as a part of the solution.

LIMITATIONS AND FUTURE RESEARCH

One shortcoming of this study was the limitation of examining areas defined by PUMAs. While the modified PUMAs in this study did represent contiguous counties, or an individual county in some instances, PUMAs did not correspond necessarily to traditional geo-political boundaries such as counties, legislative districts, or regional government compacts. As such, PUMAs did not represent a unit of analysis that is useful for most local or state policy makers. The large spatial areas represented by the modified PUMAs also likely had an

impact on the concept of relative inequality in employment opportunity in neighboring areas being able to affect local inequality in achievement. Being able to replicate this analysis at the county level would be a significant improvement toward this end. From an educational policy perspective, it might be helpful to conduct this study at the level of school district or school attendance zones.

Another important limitation was the measure of class status for students. The only indicator of class status was parental education level. Additionally, the highest distinguishable parental education level was education beyond high school. Certainly additional measures of class status, such as parental occupation, as well as better division of parental education level into higher levels, such as some college, four-year degree, and graduate degree, would have greatly improved the assignment of class status.

While this study was limited in focus to a specific policy question, the larger theoretical model presented here should be tested for the benefit of social theory. Even with the limits of the data used in this study, some additional pieces of the theoretical model could be tested. In particular, mechanisms of social support for equality such as Black population concentration, concentration of industries with more federal workers, concentration of national industries that market directly to the public, and concentration of high skill employees in the industries in the local area could be evaluated. Other important contextual factors such as school size, pupil-teacher ratio, per pupil expenditures, community and support of public schools through taxation could also be included in the analyses. Inclusion of these additional factors would allow a more complete specification and testing of the theoretical model.

Ideally, future studies would attempt to measure all parts of the theoretical model. The purpose of testing the complete theoretical model would be to show support for the hypothesized relationships, but also to show the mechanisms by which these relationships come to exist. Such a study may not be possible with existing data. Testing the complete model may require a fully encompassing data collection or a series of data collections that would fill a strategic gap between existing data sources to make such a study possible.

References

Alexander, Karl L., Doris R. Entwisle, and Maxine S. Thompson. 1987. School Performance, Status Relations, and the Structure of Sentiment: Bringing the Teacher Back In. *American Sociological Review* 52:665-682.

Allen, Theodore W. 1994. *The Invention of the White Race : Racial Oppression and Social Control*. New York: Verso.

Alwin, Duane F. 1991. Family of Origin and Cohort Differences in Verbal Ability. *American Sociological Review* 56:625-638.

American Psychological Association. (2001). *Publication manual of the American Psychological Association* (5th ed.). Washington, DC: Author.

Aschaffenburg, Karen and Ineke Maas. 1997. Cultural and Educational Careers: The Dynamics of Social Reproduction. *American Sociological Review* 62:573-587.

Astone, Nan Marie and Sara S. McLanahan. 1991. Family Structure, Parental Practices, and High School Completion. *American Sociological Review* 56:309-320.

Beck, E.M. and Glenna S. Colclough. 1988. Schooling and Capitalism: The Effects of Urban Economic Structure on the Value of Education. Pp. 113-139 in *Industries, Firms, and Jobs: Economic and Sociological Approaches,* edited by G. Farkas and P. England. New York: Plenum.

Beggs, John J. 1995. The Institutional Environment: Implications for Race and Gender Inequality in the U.S. Labor Market. *American Sociological Review* 60:612-633.

Beggs, John J, Wayne J. Villemez, and Ruth Arnold. 1997. Black Population Concentration and Black-White Inequality: Expanding the Consideration of Place and Space Effects. *Social Forces* 76:65-91.

Bellair, Paul E. and Vincent J. Roscigno. 2000. Local Labor-Market Opportunity and Adolescent Delinquency. *Social Forces* 78:1509-1538.

Biblarz, Timothy J. and Adrian E. Raftery. 1993. The Effects of Family Disruption on Social Mobility. *American Sociological Review* 58:97-109.

Blair, Heather A. 2000. Genderlects: Girl Talk and Boy Talk in a Middle-Years Classroom. *Language Arts* 77:315-322.

Blake, Judith. 1989. Number of Siblings, Family Background, and the Process of Status Attainment. *Social Biology* 33:5-21.

Blalock, Hubert M. 1967. *Toward a Theory of Minority Group Relations*. New York: Wiley.

Bonacich, Edna. 1972. A Theory of Ethnic Antagonism: The Split Labor Market. *American Sociological Review* 5:547-559.

Bourdieu, Pierre. 1977. *Reproduction in Education, Society, and Culture*. Beverly Hills, CA: Sage.

Brooks-Gunn, Jeanne, Greg J. Duncan, Pamela Kato Klebanov, and Naomi Sealand. 1993. Do Neighborhoods Influence Child and Adolescent Development? *American Journal of Sociology* 99:353-395.

Burstein, Paul. 1989. Attacking Sex Discrimination in the Labor Market: A Study in Law and Politics. *Social Forces* 67:641-665.

Caldas, Stephen J. and Carl L. Bankston. 1999. Multilevel Examination of Student, School, and District-Level Effects on Academic Achievement. *Journal of Educational Research* 93:91-100.

Catsambis, Sophia, Lynn M. Mulkey, and Robert L. Crain. 1999. To Track or Not to Track? The Social Effects of Gender and Middle School Tracking. *Research in Sociology of Education and Socialization* 12:135-163.

Collins, Patricia Hill. 1991. *Black Feminist Thought*. New York: Routeledge.

Conley, Dalton. 1999. *Being Black, Living in the Red: Race, Wealth, and Social Policy in America*. Berkeley, CA: University of California Press.

Cotter, David A., Joan M. Hermsen, and Reeve Vanneman. 1999. Systems of Gender, Race, and Class Inequality: Multilevel Analyses. *Social Forces* 78:433-460.

Cox, Oliver C. 1948. *Caste, Class, and Race: A Study in Social Dynamics.* Garden City: NY: Doubleday.

Dauber, Susan L., Karl L. Alexander, and Doris R. Entwisle. 1996. Tracking and Transitions through the Middle Grades: Channeling Educational Trajectories. *Sociology of Education* 69:290-307.

Desimone, Laura. 1999. Linking Parent Involvement with Student Achievement: Do Race and Income Matter? *Journal of Educational Research* 93:11-30.

Dornbusch, Sanford M., Phillip J. Ritter, P. Herbert Leiderman, Donald F. Roberts, and Michael J. Fraleigh. 1987. The Relation of Parenting Style to Adolescent School Performance. *Child Development* 58:1244-1257.

Downey, Douglas B. 1995. When Bigger Is Not Better: Family Size, Parental Resources, and Children's Educational Performance. *American Sociological Review* 60:746-761.

Duncan, Greg J., Jeanne Brooks-Gunn, W. Jean Yeung, and Judith R. Smith. 1998. How Much Does Childhood Poverty Affect The Life Chances of Children? *American Sociological Review* 63:406-423.

Entwisle, Doris R. and Karl L. Alexander. 1992. Summer Setback: Race, Poverty, School Composition, and Mathematics Achievement in the First Two Years of School. *American Sociological Review* 57:72-84.

Entwisle, Doris R. Karl L. Alexander, and Linda Steffel Olson. 1994. The Gender Gap in Math: Its Possible Origins in Neighborhood Effects. *American Sociological Review* 59:822-838.

Farkas, George. 1996. *Human Capital or Cultural Capital? Ethnicity and Poverty Groups in an Urban School District*. New York: Aldine de Gruyter.

Fordham, S. & J.U. Ogbu. 1986. Black Students' School Success: Coping with the burden of "acting White". *Urban Review* 18:176-206.

Fossett, Mark A. and K. Jill Kiecolt. 1989. The Relative Size of Minority Populations and White Racial Attitudes. *Social Science Quarterly* 70:820-835.

Fossett, Mark and Scott J. South. 1983. *Workers' Earnings and Corporate Economic Structure*. New York: Academic Press.

Gamoran, Adam. 1992. The Variable Effects of High School Tracking. *American Sociological Review* 57:812-828.

Hedges, Larry V. and Amy Nowell. 1999. Changes in the Black-White Gap in Achievement Test Scores. *Sociology of Education* 72:111-135.

Hofferth, Sandra L., Johanne Boisjoly, and Greg J. Duncan. 1998. Parents' Extrafamilial Resources and Children's School Attainment. *Sociology of Education* 71:246-268.

Hooks, Bell. 1984. *Feminist Theory: From Margin to Center*. Boston: South End Press.

Irvine, Jacqueline Jordan. 1990. *Black Students and School Failure: Policies, Practices, and Prescriptions*. New York: Greenwood Press.

James, Estelle, Nabeel Alsalam, Joseph C. Conaty, and Duc-LeTo. 1989. College Quality and Future Earnings: Where Should You Send Your Child to College? *American Economic Review* 79:247-252.

Jones, James D., Beth E. Vanfossen, and Margaret E. Ensminger. 1995. Individual and Organizational Predictors of High School Track Placement. *Sociology of Education* 68:287-300.

Kerckhoff, Alan C. and Elizabeth Glennie. 1999. The Matthew Effect in American Education. *Research in Sociology of Education and Socialization* 12:35-66.

Kilgore, Sally B. 1991. The Organizational Context of Tracking in Schools. *American Sociological Review* 56:189-203.

Kubitschek, Warren N. and Maureen T. Hallinan. 1996. Race, Gender, and Inequity in Track Assignments. *Research in Sociology of Education and Socialization* 11:121-146.

Lamborn, Susie D., Nina S. Mounts, Laurence Steinberg, and Sanford M. Dornbusch. 1991. Patterns of Competence and Adjustment Among Adolescents from Authoritarian, Indulgent, and Neglectful Families. *Child Development* 62:1049-1065.

Lareau, Annette and Erin McNamara Horvat. 1999. Moments of Social Inclusion and Exclusion: Race, Class, and Cultural Capital in Family-School Relationships. *Sociology of Education* 72:37-53.

Lee, Jaekyung. 2002. Racial and Ethnic Achievement Gap Trends: Reversing the Progress Toward Equity? *Educational Researcher* 31(1):3-12.

Lee, Valerie E. and Julia B. Smith. 1995. Effects of High School Restructuring and Size on Early Gains in Achievement and Engagement. *Sociology of Education* 68:241-270.

Leiter, Jeffrey. 1983. Classroom Composition and Achievement Gains. *Sociology of Education* 56:126-132.

Liberson, Stanley. 1976. Rank-Sum Comparisons Between Groups. *Sociological Methodology* 6:276-91.

Liberson, Stanley. 1980. *A Piece of the Pie: Black and White Immigrants Since 1980*. Berkeley, CA: University of California Press.

Loury, Linda D. and David Garman. 1995. College Selectivity and Earnings. *Journal of Labor Economics* 13:289-308.

MacLeod, Jay. 1995. *Ain't No Makin' It*. Boulder, CO: Westview Press.

Martin. 1998. Becoming a Gendered Body: Practices of Preschools. *American Sociological Review* 63:494-511.

McLeod, Jane D. and Michael J. Shanahan. 1993. Poverty, Parenting, and Children's Mental Health. *American Sociological Review* 58:351-366.

National Commission on Excellence in Education. 1983. *A Nation at Risk: The Imperative for Educational Reform*. Washington, DC: U.S. Government Printing Office.

Oliver, Melvin L. and Thomas M. Shapiro. 1995. *Black Wealth/White Wealth: A New Perspective on Racial Inequality.* New York: Routledge.

Omi, Michael and Howard Winant. 1994. *Racial Formation in the United States: From the 1960s to the 1990s*. New York: Routledge.

Parcel, Toby L. 1979. Race, Regional Labor Markets and Earnings. *American Sociological Review* 44:262-269.

Powell, Brian and Lala Carr Steelman. 1993. The Educational Benefits of Being Spaced Out: Sibship Density and Educational Progress. *American Sociological Review* 58:367-381.

Price, Jeremy N. 1999. Schooling and Racialized Masculinities: The Diploma, Teachers, and Peers in the Lives of Young African American Men. *Youth & Society* 31:224-263.

Reich, Michael. 1971. The Economics of Racism. In *Problems of Political Economy,* edited by David M. Gordon. Lexington, MA: Heath.

Reskin, Barbara F. and Irene Padavic. 1994. *Women and Men at Work*. Thousand Oaks, CA: Pine Forge Press.

Risman, Barbara J. 1998. *Gender Vertigo: American Families in Transition*. New Haven: CT: Yale.

Rist, Ray C. 1970. Student Social Class and Teacher Expectations: The Self-Fulfilling Prophecy in Ghetto Education. *Harvard Educational Review* 40: 411-451.

Roediger, David R. 1999. *The Wages of Whiteness : Race and the Making of the American Working Class* (Revised Ed.). New York: Verso.

Roscigno, Vincent J. 1996. *Race, Place, and the Reproduction of Educational Disadvantage: The Black-White Gap and Local Structures of Opportunity.* Raleigh: NC: Unpublished doctoral dissertation.

Ross, Catherine E. and Chia-ling Wu. 1995. The Links Between Education and Health. *American Sociological Review* 60:719-745.

Steelman, Lala Carr. 1985. A Tale of Two Variables: The Intellectual Consequences of Sibship Size and Birth Order. *Review of Educational Research* 55:353-386.

Steinberg, Laurence, Sanford M. Dornbusch, and B. Bradford Brown. 1992. Ethnic Differences in Adolescent Achievement. *American Psychologist* 47:723-729.

Steinberg, Laurence, Susie D. Lamborn, Nancy Darling, Nina S. Mounts, and Sanford M. Dornbusch. 1994. Over-Time Changes in Adjustment and Competence Among Adolescents from Authoritative, Indulgent, and Neglectful Families. *Child Development* 65:754-770.

Sucoff, Clea A., and Dawn M. Upchurch. 1998. Neighborhood Context and the Risk of Childbearing Among Metropolitan-Area Black Adolescents. *American Sociological Review* 63:571-585.

Taylor, Marylee C. 1998. How White Attitudes Vary with the Racial Composition of Local Populations: Numbers Count. *American Sociological Review* 63:512-535.

Thomas, Melvin E. 1993. Race, Class, and Personal Income: An Empirical Test of the Declining Significance of Race Thesis, 1968-1988. *Social Problems* 40:328-342.

Thomas, Melvin E. 1995. Race, Class, and Occupation: An Analysis of Black and White Earning Differences for Professional and Non-Professional Males, 1940-1990. *Research in Race and Ethnic Relations* 8:139-156.

Thompson, Bruce. 2002. What Future Quantitative Social Science Research Could Look Like: Confidence Intervals for Effect Sizes. *Educational Researcher* 31(3): 25-32.

Thorne, Barrie. 1993. *Gender Play: Girls and Boys in School*. New Brunswick, NJ: Rutgers University Press.

Tienda, Marta and Ding-Tzann Lii. 1987. Minority Concentration and Earnings Inequality: Blacks, Hispanics, and Asians Compared. *American Journal of Sociology* 93:141-165.

Tilly, Charles. 1998. *Durable Inequality.* Berkeley, CA: University of California Press.

Tolbert, Charles M., Patrick M. Horan, and E.M. Beck. 1980. The Structure of Economic Segmentation: A Dual Economy Approach. *American Journal of Sociology* 85:1096-1116.

Tomaskovic-Devey, Donald. 1987. Labor Markets, Industrial Structure, and Poverty: A Theoretical Discussion and Empirical Example. *Rural Sociology* 52:56-74.

Tomaskovic-Devey, Donald. 1991. A Structural Model of Poverty Creation and Change: Political Economy, Local Opportunity, and U.S. Poverty 1959-1979. *Research in Social Stratification and Mobility* 10:289-322.

Tomaskovic-Devey, Donald. 1993. *Gender and Racial Inequality at Work : The Sources and Consequences of Job Segregation*. Ithaca, NY: ILR Press.

Tomaskovic-Devey, Donald and Vincent J. Roscigno. 1996. Racial Economic Subordination and White Gain in the U.S. South. *American Sociological Review* 61:565-589.

Tomaskovic-Devey, Donald, Catherine Zimmer, and Sandra Harding. 2002. Gender Segregation and the Generation of Organizational Inequality: A Comparison of Australian and U.S. Organizations. Raleigh: NC: Unpublished draft.

U.S. Department of Education. 1999. *The Condition of Education.* Washington, DC: U.S. Government Printing Office.

Walters, Pamela Barnhouse and Carl M. Briggs. 1993. The Family Economy, Child Labor, and Schooling: Evidence from the Early Twentieth-Century South. *American Sociological Review* 58:163-181.

Willis, Paul. 1977. *Learning to Labor*. New York: Columbia University Press.

Wilson, William J. 1987. *The Truly Disadvantaged : The Inner City, the Underclass, and Public Policy*. Chicago: University of Chicago Press.

Zajonc, Robert B. 1975. Birth Order and Intelligence: Dumber by the Dozen. *Psychology Today* 8:37-43.