The Role of School and Neighborhood Context in Patterns of Intergenerational Transmissions of Socioeconomic Status

Karen Gerken
The University of North Carolina at Chapel Hill

<u>Introduction</u>

Social stratification is a key issue in sociological research, one that has grown in relevance as inequality in the United States continues to increase. Since Blau and Duncan's (1967) fundamental work on how parents pass on their socioeconomic status (SES) to their children, the intergenerational transmission of societal status has been often cited as a reason for the limited amount of mobility between social classes. Recent estimates show that parental socioeconomic status predicts a sizeable portion of the variation in their children's SES (Nam 2004, Musick and Mare 2004). Researchers have investigated just how parents are able to pass their SES onto their children, focusing on the importance of education in the production of human capital (Card 1999, Schultz 1961, Becker 1962),

While human capital is undoubtedly important, other realities of social context and background likely matter as well. Social capital likely plays a role in this intergenerational transmission of SES (Laraeu 2003). However, various individual level mechanisms that may build social capital and thus may be important for this intergenerational relationship between parent and child SES have yet to be empirically tested. In addition, another aspect of intergenerational transmissions of SES that has not been fully examined is the impact of context on SES attainment. Adolescence is a key time for development, and as teens spend a good portion of their time away from the home, neighborhood and school context can have profound effects on their transition to adulthood, effecting their human and social capital (Brooks-Gunn et al 1993, Wodtke et al 2011, Page and Solon 2003). Using the National Longitudinal Study of Adolescent Health (Add Health), I study how neighborhoods and

schools, as well as individual characteristics, influence adolescents' trajectories from their parent's socioeconomic status to establish their own socioeconomic status as they move into young adulthood. Add Health's unique nationally representative, clustered sample, rich with contextual and longitudinal data, allows me to examine how adolescents' neighborhoods and schools impact their eventual SES and exactly which features of these contextual structures carry the greatest weight during this transition.

I build multilevel models and find that there is variation in income attainment among respondents across contexts. Some of this variation is explained by contextual composition, as individual and family background characteristics matter a great deal for income attainment. Specifically, children from wealthier families are more likely to participate in activities associated with increased incomes in early adulthood. However, variation between schools still exists, and neighborhood disadvantage and advantage levels significantly impact their adolescent resident's eventual income attainment. School level variables are less important for this relationship. Most interestingly, neighborhood and school effects have varying effects by parental economic background, and by respondent gender. I argue that understanding how family background is related to and interacts with contexts to affect income attainment in the transition to adulthood can help policy makers focus intervention policies to increase mobility and poor children's life chances.

Background

Income Attainment

Studies that have focused on the determinants of adult income often cite the importance of education for improving one's life chances (Card 1999, Boxman et al 1991). Investment in higher education builds human capital: skills and knowledge that can

translate in better jobs and higher income potential (Schultz 1961, Becker 1962). Social capital, or the value of the social resources attributed to one's position in social networks can be connected to human capital and thus possible economic success (Coleman 1988). Human and social capital can both interact to and independently affect income attainment (Boxman et al 1991).

Importance of Parents for Increasing Capital

Of course, human and social capital are not formed in a vacuum, and parents are very important in investing in and supporting both forms of capital. Blau and Duncan (1967) produced a seminal work on how parental social class impacted that of their children. They developed a status attainment model, in which parental socioeconomic status, measured by occupation, is related to one's own status attainment, also measured as occupation. However, the relationship is mediated by children's educational attainment, such that wealthier, higher status parents can invest in better and more education for their children, which thus improves their chances for occupational and economic success.

To explain how parental economic status impacts children's eventual economic success, many build off the Blau and Duncan status attainment model by focusing on the role of human capital. This model maintains that if parents have economic resources, they will thus to be able invest in their children's human capital through education and other means which will eventually increase their children's future income (Hill and Duncan 1987, Mayer and Lopo 2005, Nam 2004, Haverman and Wolfe 1994). On the other hand, poor parents cannot afford the same investments, which results in their children lacking the same returns wealthier children are provided.

The relationship between parent and child's SES isn't purely economic, and social capital can be the product of parental investment as well. The family resource model draws on non-economic resources that poor parents often lack (Nam 2004). Low economic status is often associated with unstable families, and these may be the factors that impact children's potential SES by leaving them with fewer abilities to eventually earn high wages. (See Corcoran 1995 for a review on the consequences of growing up in poverty that extend beyond economics). Childrearing and parenting behaviors also vary based on social class, with lower-class and middle-class parents using different ways to foster certain skills for their children (Lareau 2003). Specifically, middle-class parents practice what Lareau calls "concerted cultivation", encouraging their children to participate in organized activities, which increases their human capital and prepares them to succeed in a middle-class jobs.

How much does parent SES matter?

Researchers have found support for the Blau and Duncan status attainment model, such that parental income is correlated with the educational attainment of their children, such that wealthier families have children who obtain more years of school (Hill and Duncan 1987, Duncan et al 1998, Plug and Vijverberg 2005). Beyond educational attainment, various others have attempted to assess how dependent adult economic attainment is on their parent's income. Peters (1992), using longitudinal data, estimated that only 10% of variation in son's income could be attributed to variation in their fathers' income. One study using data on brothers assessed that between 40 – 45% of adult income was related to family economic backgrounds (Hauser and Sewell 1986). However, others using average parental income regressed on average adult income attainment have found much larger coefficients, as high as .80 (Behrman and Taubman 1990, Solon 1992). Even

controlling for parental education, additional income made by parents is positively

associated with the income earned by their children in adulthood (Hill and Duncan 1987).

The Importance of Context: Effects above and beyond individual risks

In general, while family- and peer-effects are generally larger than school- and

neighborhood- effects, context still matters above and beyond individual characteristics

and is important to consider when examining the intergeneration transmission of SES

(Duncan et al 2001). Several theories connect social environments, especially

disadvantaged settings, to individual outcomes above and beyond the effects of individual

characteristics. While not specifically discussing mobility, Jencks and Mayer (1990)

describe five main types of theories that show how people in neighborhoods might be

influenced by the contexts in which they live. The first three hypothesize why people living

in disadvantaged neighborhoods may be worse off than their peers in more advantaged

areas. Epidemic theories suggest that negative behaviors may be contagious among

residents of a certain area. "Collective socialization" models theorize that actions of the

majority of the residents in a neighborhood influence others to behave in certain ways or

subscribe to certain norms. Finally, they discuss how difference in institutional resources,

like schools, community organizations and public services, may result in worse outcomes

for those living in poor areas with fewer resources (Sampson and Groves 1989, Jencks and

Mayer 1990). Advantage can work in the opposite way, as more social support and positive

collective socialization is associated with better health, less delinquency and better

educational outcomes [Cantillion 2006, Ainsworth 2002].

These first three models of neighborhood effects suggest why living in poor areas

may be especially harmful for the lower SES groups, what Robert (1999) refers to as the

"double jeopardy" hypothesis. However, Jencks and Mayer (1990) also discuss two theories that suggest that low SES people living in advantaged neighborhoods may be worse off than those living in disadvantaged neighborhoods, due to competition for resources and "relative deprivation" (Robert 1999). On a theoretical basis all of these models have the potential to explain how community characteristics may impact individual SES outcomes, but little, if any, research has examined how these theories may parse out in reality.

Above and beyond family background and individual characteristics, community disadvantage has been linked to increased rates of a variety of non-normative behaviors, including dropping out of school, teen pregnancy and leaving home during adolescence (Harding 2003, Harding 2007, Wickrama et al 2005, Ainsworth 2002). Most of the work linking neighborhood context to behavioral and health outcomes is conducted with cross-sectional data sets, showing that current neighborhood disadvantage or advantage is associated with certain individual characteristics (Sampson et al 2002). However, less has been done with longitudinal data, attempting to link later-in-life outcomes with early neighborhood context in adolescence. One recent study did show that prolonged time spent living in disadvantaged neighborhoods in youth does decrease the probability of graduating high school (Wodtke et al 2011), though it did not directly address the themes of intergenerational transmissions of SES.

Surprisingly, school quality effects on student's labor market outcomes are small, once background characteristics are controlled for (see Haushek 1997 for review). However, while the quality of resources and productivity of a school may play a smaller role in affecting educational outcomes, characteristics of schools may interact with family background to influence certain outcomes. One multilevel study linked average school SES

and within-school inequality to higher rates of depression among adolescents (Goodman et al 2003). Others have shown that correlations between peers and others in their schools regarding achievement and delinquency are significant (Duncan et al 2001).

Interactions between Context and Family Background

All in all, neighborhoods and schools impact a variety of outcomes for adolescents. However, recent developments in multilevel modeling have begun to investigate how these effects interact with family background. Poor students living in poor neighborhoods are generally worse off there than children of similar socioeconomic backgrounds in comparatively advantaged contexts. Low-income students are more likely to be depressed, but those attending poor schools are especially at risk (Goodman et al 2003). Similarly, social support protects against depression in teens, but the effects are stronger in advantaged neighborhoods (Wight 2006). While small-classroom size improves test scores for all students, the results were most profound among poor and minority students (Kruger 1999). Others have found that neighborhood disadvantage and advantage may matter more for whites than for minorities (Brooks-Gunn et al 1993, Wickrama et al 2005). One study focused on both family and neighborhood effects on intergenerational transmissions of education demonstrated neighborhoods matter differently for various types of children. Community context is most important for predicting educational attainment of low-educated families, while family matters more for highly educated families (Patacchini and Zenou 2011). Because community contexts seem to matter for poor children above and beyond economic disadvantage, these theories seem to suggest an amount of cross-level interactions that should be further investigated.

Parental selection into neighborhoods/schools

As most researchers who study neighborhood and school effects acknowledge, selection effects can often bias the estimates for how much neighborhoods and schools matter above and beyond individual level factors (Sampson et al 2002, Brooks-Gunn 1993). A number of things influence people's decisions to move into neighborhoods and send their children to certain schools [Sampson and Sharkey 2008]. While SES matters for this selection, a number of other personal variables may also be related to neighborhood and school selection. This poses a problem, as some of these characteristics may be related not only to neighborhood and school selection, but also outcome variables of interest. Even more problematic is that some of these factors are impossible to observe and thus control for. The only true way to control for these unobserved characteristics is through experimental designs, which the Moving To Opportunity study attempted to do (Katz 2010), though random assignment into neighborhoods and schools is generally not a feasible option.

Researchers can try to control for as many observed characteristics as possible that might influence both neighborhoods selection and the outcome variable. Add Health contains a unique set of questions related to neighborhood and school selection and other parental behaviors that I can add in as controls, turning often-unobserved characteristics into observable, controllable variables (see the appendix oft this paper for more information).

Study Design:

Using Add Health, I examine determinants of income attainment in early adulthood, focusing on how parental income is related to these determinants, which include neighborhood and school context. Figure 1 shows my conceptual model. Parental income

impacts adult income, but mostly through individual level mechanisms and selection into schools and neighborhoods. Neighborhoods and schools may also moderate the intergenerational transmission of SES, as Figure 2 shows. With this design, I assess the following hypotheses:

1. Parental income matters for adolescent's eventual income attainment in young adulthood, but only in so much as parent income is associated with a variety of family background and individual characteristics that are correlated with income attainment in early adulthood. Family structure and race will likely be among the variables that influence children's socioeconomic attainment, as the literature suggests. the transmission of SES operating through a variety of individual-level mediating mechanisms: community service, extracurricular sports and clubs and mentors. Higher SES parents may encourage their children to participate in community service and extracurricular activities and connect them with a mentor, examples of what Lareau (2003) calls "concerted cultivation" that serve to build human and social capital. Higher SES children would thus be better equipped for educational attainment and professional and economic success that would lead them to be higher SES adults. I hypothesize that children from high-SES backgrounds will be more likely to participate in community service and many school activities, have a mentor and a higher number of friends. I also hypothesize that these variables will all be positively associated with socioeconomic status attainment. I hypothesize these relationships will persist once race, age, sex and family structure are controlled for.

2. Adult income attainment varies by school context in adolescence. Some of this variation is due to contextual composition of families, though measures of neighborhoods and school disadvantage and advantage will be associated with income attainment in early

adulthood, explaining some of the variation between adolescent school contexts. Neighborhoods can be a mediating mechanism through which wealthy parents select to live in advantaged neighborhoods in order to ensure the transmission of socioeconomic status. Two theories of how neighborhoods effect adolescent development are important for this transmission: institutional resources and collective socialization (Jencks and Mayer 1990). High SES families likely pay more taxes, which build the resources available to children both in the schools and in the neighborhoods that again will likely impact their human and social capital and improve their odds of remaining in high SES brackets. Collective socialization theories suggest that children are socialized not just by their parents but also by other residents of their neighborhood and peers at their school.

3. However, neighborhoods and schools may also moderate the relationship between parental and adult SES, as they may impact lower-SES children differently than their higher-SES peers. Two theories offer competing predictions for how poor children might fair in high SES neighborhoods. Such neighborhoods and schools, rich with resources, may be a way for poor children to gain the human and social capital they cannot learn from their own family background. Thus the institutional model would suggest that neighborhoods could impact poor students eventual SES to a greater extent than relatively more advantaged adolescents (Jencks and Mayer 1990). However, the relative deprivation model posits that poor adolescents may be worse off in higher SES environments, as they may not be able to successfully navigate these contexts and therefore miss out on the benefits more resources carry (Jencks and Mayer 1990). Thus, while I am unsure the direction in which contexts may effect high and low SES adolescents differently, I do

propose that neighborhoods and schools moderate the intergenerational transmission of social class for a subset of the population.

Data

I use data from two waves of the National Longitudinal Study of Adolescent Health (Add Health). Add Health is a nationally representative, multistage stratified survey begun in adolescence, sampling students in grades 7 through 12 during the 1994-1995 school year. The sample is drawn from and clustered within 132 schools (80 high schools and the middle schools and junior high schools that feed into them). In addition to the original study, three additional waves of data collection have been conducted, essentially following these students from adolescence through the early portion of their life course.

The main independent, control and explanatory variables come from Wave I of Add Health. I combine information from the original in-school survey, the in-home parental questionnaires, the in-home respondents interviews and the community- and school-level data compiled by the research team. The dependent outcome variables come from the in-home interviews of Wave IV, administered in 2008/2009 when most of the respondents were between 24-34 years old. Previous studies that have examined similar research questions have not had the advantage of detailed, longitudinal data sources like Add Health. Not only do I have information about the socioeconomic characteristics of the respondents and their parents, I also have in-depth details about their characteristics and activities from adolescence through early adulthood. In addition, Add Health contains a wealth of contextual information linked to the respondent's neighborhoods and schools in Wave I.

Measures

Dependent and Independent Variables:

My outcome variable of interest is the socioeconomic status of the respondents in early adulthood. The debate on how to best measure SES is ongoing and complicated, as no single aspect of class (education, earnings, occupation) can fully account for its multifaceted nature. As such, I investigated a number of proxies for socioeconomic status, including educational attainment, household income, occupational prestige, and an index that encompasses all three. I concluded that income is my best option for measuring SES.

I acknowledge that income is a fairly volatile measure of SES and can fluctuate over the life course. Thus, I am limiting my analysis to drawing conclusions about young adulthood, one specific point in which we can examine socioeconomic status. Comparing a respondent to his or her peers in Wave IV is similar to comparing his or her parents to other parents in Wave I. Income data for respondents in adulthood comes from Wave IV of Add Health. Despite the fact that they are just now reaching young adulthood (ages 24- 34), there is still a substantial amount of income variation among the respondents.

Respondent income in early adulthood was collected from the Wave IV in-home questionnaire in response to the question, "Thinking about your income and the income of everyone who lives in your household and contributes to the household budget, what was the total household income before taxes and deductions in {2006/2007/2008}?" The Wave IV in-home survey asked respondents to choose a range in which their household income fell. In order to make it linear, I set their incomes as the midpoint of the categories (which mostly encompassed only a five or ten thousand dollar range).

My main independent variable is parental income, which was collected from the parental questionnaire, in which a parent (most often the mother) responded to the question "About how much income, before taxes, did your family receive in 1994? Include

your own income, the income of everyone else in your household, and income from welfare benefits, dividends, and all other sources." This parental household income was reported in thousand of dollars (range 0 – 999 thousand).

Sociodemographic and Parental Background Controls:

I control for a number sociodemographic variables, including race, sex, age, family structure and immigrant status, that may affect income attainment. While respondents could indicate that they self-identified as several races, I use a five-category combined race and ethnicity variable that categorizes respondents as one race. Hispanics of any race are "Hispanic", while non-Hispanics are placed in one of the other four racial categories: White, Black, Asian or Native American/Other. Age is measured as age at Wave IV. I also control for family structure, which I collapse into five categories: two-parent, biological, two-parent, other (stepfamilies), single mother, single dad, and other (grandparent-headed or foster homes). Immigrant status is also included in my models. Foreign-born respondents are categorized as first generation, native-born respondents with foreign-born parents are indicated as second generation, while all others (native-born respondents with native-born parents) are collapsed into the third generation category. I also control for parental education, specifically whether or not the respondent had at least one parent who completed college.

Wave IV Individual Level Controls

Because my income measure is a household income measure, I considered whether the respondent had been married to attempt to control for dual-income households. I also control for whether the respondent had earned a college degree by Wave IV. Presumably, some of the sample may not have completed their education at the time of the Wave IV

survey, especially some of the younger respondents. Nonetheless, a college degree is likely an important predictor for income attainment levels, and as such I include a dichotomous variable that equals 1 if the respondent reported having a college degree or more.

Individual-Level Mechanism Variables

Add Health has a number of unique variables that have not been examined previously as mediating mechanisms in the intergenerational transmission of SES. These include whether the respondent engaged in community service, the number of school activities (clubs or sports) they participated in, and popularity (the number of friends in the social network). Community service in adolescence is reported in Wave III when respondents were asked, "Between 12 and 18 years old, did you regularly participate in volunteer or community service work?" The community service dichotomous variable excludes respondents whose service was court-ordered. Number of school activities is the sum of the amount of sports or clubs the respondent reported participating in on the Wave I in-school questionnaire. Because most students participated in between one and three activities, I use that category as my reference group and compare those respondents to those who had no school activities and to those who participated in four or more clubs or sports. Finally, popularity, or number of friends, is drawn from the social network data compiled from the in-school survey. All students at the respondents' schools were asked to name up to ten friends (five male and five female). I use the in-degree number of friend nominations (the number of other students who listed the respondent as a friend) as a more objective measure of popularity and friend count.

To control for personal characteristics that may affect eventual income attainment, I include a measure of cognitive ability, AHPVT, which is the respondent's standardized

score on a short vocabulary test that is meant to capture verbal aptitude. I also include a dichotomous measure of college aspiration. Students were asked, "On a scale of 1 to five, where 1 is low and 5 is high, how much do you want to go to college?" For my measure, respondents who answered with a four or a five were recoded as "wanted college".

School- and Neighborhood-Level Variables:

Because students were sampled from the 132 selected schools, data on school quality and characteristics come from the school administrator questionnaires, filled out by representative from each school. Proportion new teachers comes from the question, "Approximately what percentage of your full-time classroom teachers are new (i.e., began teaching at this school during the present school year?" and proportion MA teachers comes from the question, "Approximately what percentage of your full-time classroom teachers hold Master's degrees or higher?". In addition to the school reported data, the Add Health research team also constructed two relevant variables related to the urbanicity and size of the school. My categorical urbanicity variable labels schools as either urban, suburban or rural. Urban schools are located within the central city of Consolidated Metropolitan Statistical Area (CSMA) or Metropolitan Statistical Area (MSA). Suburban cities were either also located in a CSMA or MSA, but not in the central city or non in a CSMA/MSA but in a place with a population larger than 2,500. Rural schools are in places whose small populations do not fall in any of the above categories. School size was also compiled by Add Health, placing schools into three groups: small, medium or large. Small schools had 400 or less students, medium schools have between 401 and 1000 students, and large schools had more than 1,001 students.

Neighborhood level data comes from census-tract data from the 1990 United States Census linked to respondents in Wave I. With this census tract information, I build two indexes, one of neighborhood disadvantage (NDI) and neighborhood advantage (NAI). The aspects of neighborhood disadvantage I am most concerned about include proportion of households that are headed by females, proportion of families receiving public assistance, proportion of poor families (with incomes under the poverty line), proportion of affluent families (families with household incomes over $40,000), proportion of male who are unemployed, and proportion of residents over age 25 without a high school degree. For each measure, a census tract can have one count of disadvantage if it falls in the top quartile of all census tracts. I formed the NDI by summing all the dummy measures for each tract such that the index can range from 0 (no disadvantage) to 5 (high disadvantage). The NAI is constructed similarly, but from four measures of neighborhood advantage, thus ranging from 0 (no advantage) to 4 (high advantage). The four variables that form the NAI are proportion of households who own their homes, proportion of wealthy families (with incomes above $75,000), proportion of residents employed in managerial or professional occupations, and the proportion of residents 25 and above with a college degree.

Methods

To assess whether schools and neighborhoods have an effect on how parental background matters for adult income attainment, I construct multilevel models to test for and explain between context variation. While I would ideally be able to use multilevel models with both neighborhoods and schools as level-2 clusters, the structure of the Add Health data and the sampling weights that are necessary to adjust the standard errors correctly can only be used for school level clustering. As such, I use the school in Wave I as

the level 2 cluster variables. Neighborhoods are clustered within schools, so I am able to include neighborhood variables to explain variation in income attainment across schools, even though I am unable to cluster further by neighborhood.

I first test a null model to test for variation between schools. I then add individual-level explanatory variables to examine correlations that occur between variables at the individual level. Next, I include level 2 school and neighborhood variables to attempt to explain some of the school level variation. Finally, I include interaction terms that assess if the effect of such school and neighborhood variables varies by parental income.

Results

Table 1 describes the characteristics of my final full sample (n = 5,890) in addition to how the various subsamples (determined by parental income quartile) differ by the various variables . Mean income in adulthood is 65.395 thousand dollars, though there is significant difference in mean outcome by parental background. Those who grew up in the highest quartiles on average make more than 30 thousand dollars in early adulthood than those who grew up in the bottom quartile. While 72.56% of the sample is white, 15.03% is black and 8.82% is Hispanic, the differences by parental income quartile are profound. Both the third and fourth quartiles are over 80% white and less than 10% black, while nearly a third of the lowest quartile is black (29.28%). The largest proportion of Hispanics is also found in the bottom quartile (13.05%).

In addition to clear racial patterns, other family background characteristics are strongly associated with parental income quartile. While 60% of the sample was living with both biological parents at Wave I, less than a third of the lowest quartile lived in two biological parents. 17.55% of the sample lived with one biological parent and a step-parent,

but this doesn't vary significantly across the quartiles. Single mother families made up nearly half of the first quartile (44.84%), while less than a fifth of the whole sample grew up with just a mother at home. College education of parents is also very related to parent income quartile. While on average 36.01% of families have at least one parent with a college degree, those in the highest quartile are nearly seven times more likely to be in that category than those the first quartile.

Several of my hypothesized important individual level variables at Wave I also vary by parental income quartile. The wealthiest children had almost 1.5 more friends than the poorest children. Those in the bottom two quartiles were nearly twice as likely to participate in no school activities than those in the highest quartile. While a fourth of the sample participated in four or more school activities, the highest quartile is twice as likely to do so than the lowest. A large portion of all respondents did some sort of community service as an adolescent, though the amount of participation increased as parent income increases. The large majority of all students had college aspirations, and while the lowest quartile had lowest proportion with college aspirations, nearly four-fifths still indicated college was in their plans.

In Wave IV, it is clear actual college completion varies dramatically by parental income quartile. While over a third of the whole sample graduated from college, only 16.44% of the lowest quartile did so. College graduation increased with parental income quartile, peaking with well over half of the respondents from the highest quartile graduating from college by Wave IV. While college completion varies significantly, the proportion ever married does not. Slightly over half the sample has been married.

As the school and neighborhood context descriptive statistics in Table I show, children of different backgrounds are living in different areas and attending different types of schools. While most live in neighborhoods with little disadvantage (average NDI = 1.07), those in the lowest quartile live in neighborhoods with twice that level of disadvantage (NDI = 2.10) and those in the highest quartile experience less than half the disadvantage (NDI = 0.44). In terms of advantage, the average NAI for all respondents is less than 1 (.92%). NAI does increase as parental income increases, from less than .5 in the lowest quartile (0.46) to nearly three times that in the highest quartile (1.48).

On average, the sample attended schools that had about 9.32% new teachers and about half teachers with masters degrees. The highest quartile was slightly more likely to have both new and MA teachers than respondents in the other three quartiles. Most of the whole sample (59.21%), and of each subsample, attended a suburban school, though the two highest quartiles also had the two highest proportions of suburban students. The poorest two quartiles were also the most likely to be attending rural schools. And while on average most students attend a medium size school, the upper two quartiles were more likely to attend a large school, while the lowest two quartiles were the most likely to attend small schools.

As demonstrated above, parental income is correlated with a number of other family background characteristics, individual student qualities and contextual variables. In order to test whether these differences begin to explain the variation in adult income attainment, I use multilevel models. First, I tested a null model to see if there is variation in income attainment by school in adolescence. The null model is presented in Table 2, and does show significant variation between schools. Models 1-5 in Table 2 assess whether this variation

can be explained by individual level factors, and to what extent these matter for adult income attainment.

As Model 1 shows, there is a small but very significant bivariate relationship between parental income in Wave I and adult income attainment in Wave IV. For every additional 1,000 dollars of parental income, adult income increases 75 dollars. Controls for additional background characteristics added in Model 2 reduce the coefficient to .055, though these is still a significant relationship demonstrated between parent and adult income. Being female, Black and growing up in a household without two biological parents all have large negative effects on eventual income attainment. Older respondents are more likely to have higher incomes. Model 3 introduces parental education, showing that children with at least one parent with a college degree have much higher household incomes in early adulthood.

Model 4 includes my hypothesized individual level mechanisms, which completely attenuate the effect of parental income on adult income. Higher PVT scores have a small association with higher adult incomes. Each in-degree friend nomination carries more than an additional one thousand dollar increase in income (1.049). Those who participated in no school activities had lower incomes, and those with more than four activities had much higher incomes than those who participated in an average number of activities. College aspirations and voluntary community service in adolescence both are associated with large increases in adult income attainment. When I control for marital status and college degree status in Wave IV in Model 5, the effects of these individual level mechanisms shrink slightly but all but PVT score still remain significant.

However, despite these additional level 1 variables reducing the variation between schools, there is still some variation between schools (ICC = .0378). Model 6 shows that in addition to individual characteristics, NDI and NAI do have an effect on eventual income attainment. Each additional marker of disadvantage is associated with a relatively large, significant decrease in income while an increase in advantage has a slightly larger, significant increase. Model 7 introduces school characteristics, demonstrating that children who attend urban or suburban schools have equally positive increases in income compared to those in rural schools. While the proportion of new and master's degree teachers is insignificant, attending large schools is significantly beneficial for students.

Model 8 includes an interaction effect between NDI, NAI and parental income. In doing so, the effects of living in disadvantaged or advantaged neighborhood increases, positively or negatively respectively. However, wealthier respondents actually do slightly better in disadvantaged neighborhoods compared to poor adolescents. Figure 3 plots the mean predicted income based on Model 8 by parental income category and NDI score.

At the school level, there is a small but significant interaction between parental income and the proportion of new teachers in a school. In Model 9, as parental income increases, there is a more negative effect in increasing the percentage of new teachers. In Model 10, I include both neighborhood and school variables and interactions. The NDI and NAI effects persist, as does the interaction between NDI and parent income. For the school level variables, the school size effect disappears, but a positive interaction between parental income and the proportion of teachers at one's school with master's degrees.

I also ran separate multilevel models for males and females. Table 2 shows gender differences in how contextual variables affect eventual income, in addition to cross-level

interaction differences by sex. While most of the individual level variables had qualitatively

similar effects on income attainment in young adulthood, there are significant differences

for the effects neighborhood advantage and disadvantage had on men and women. As

Model 6 for women shows, the positive effect of NAI decreases as parental income

increases, while there is no interaction between NDI and parent income. Figure 4 shows

this interaction by plotting mean predicted probabilities by income quartile and NAI score.

For males, the effect of both aspects of neighborhoods increases relative to women

and to the full model. Each additional marker of disadvantage reduces income attainment,

while each extra neighborhood advantage increase is correlated with higher incomes in

early adulthood. The interaction effect for males between parent income and

neighborhoods is only significant for NDI and is shown in Figure 5.

Discussion

At first glance, it may seem that parental income in adolescence has little effect on

one's eventual income attainment. The correlation coefficient between parent and child

income is tiny compared to other background characteristics, yet still significant once the

model is adjusted for other sociodemographic variables. In Model 3 for the full sample, the

predicted increase in adult income for just one additional year of age is approximately the

same as an additional $35,000 in parental income. Essentially, the bivariate and adjusted

bivariate relationships between parental and early adulthood income are unremarkable.

However, despite this lack of a direct strong relationship, it is impossible to ignore

the way in which parental income is correlated with a number of mediating mechanisms at

both the individual and contextual levels to significantly impact eventual income

attainment in early adulthood. Race and family structure are closely related to income in

adulthood, and both are also strongly associated with parental income. Growing up with a single parent has a significant negative penalty for eventual income attainment, and the poorest families are most likely to have a single parent (over half of the lowest income quartile was a single mother or single father family). Parental education is also highly, positively correlated with their children's income attainment, a relationship that is completely attenuated when Wave IV college degree is added in. Therefore higher education is very important for income attainment, and more common among the most advantaged children, confirming Blau and Duncan's class status attainment model (1967).

In addition to confirming a variety of background traits that the literature has deemed important to the relationship between the income parents and children, my analysis also illuminates the role that certain individual mechanisms in adolescence have in transmitting SES between generations. Friendships, school activities and community service all operate in the direction I expected them to. More friends and more activities in adolescence are associated with higher incomes in adulthood, as is volunteering in the community. Participating in no activities is negatively correlated with income attainment. These activities and relationships are all ways in which adolescents can build social capital, which they can translate into human capital and eventually higher income in early adulthood. Not only are these activities important, but it is important to remember who is mostly likely to participate in schools activities, have the most friends or volunteer: adolescents with wealthier parents. Presumably, these children are encouraged to make friends, participate in activities and volunteer by their middle and upper class parents, what Lareau calls "concerted cultivation" (Lareau 2003). Thus, the transmission of SES is not direct, but instead operates through these individual level mechanisms in adolescence.

But while individual level mechanisms explain a large portion of the transmission of SES between parents and their children, there still is some variation in income attainment between contexts. While the clustering structure allows me to confirm that variation exists between schools, I use neighborhood measures in addition to school characteristics in order to assess the impact of contextual disadvantage and advantage. Both the NDI and NAI has strong, significant effects on resident's eventual income attainment. As disadvantage increases, income is likely to decrease. Conversely, more advantage is associated with more income in early adulthood. This confirms my hypothesis that one reason parental income is important for their children's income is the types of neighborhoods parents either choose to live in (or are unable to choose to leave). Higher income parents lived in, on average, more advantaged and less disadvantaged neighborhoods. Poor parents, on the other hand, live in more disadvantaged and less advantaged neighborhoods. As such, neighborhood selection by wealthier parents is one way they can transmit their high SES across generations.

Surprisingly, though a certain amount of variation exists between schools, the variables I used to attempt to illuminate the variation did not have great explanatory power. Larger schools were associated with the higher income, perhaps because these schools are able to offer a wide variety of school activities and possible friends to their students. Urbanicity mattered, but only so far as rural schools were associated with lower eventual income, which might be reflecting neighborhood disadvantage rather than school disadvantage. The composition of the teaching staff, in terms of new and highly-educated teachers, was insignificantly related to adult income.

To see whether parental income can have a differential effect across neighborhood contexts, I tested an interaction term between parent income and NDI and NAI. For the full sample, this interaction term is small but positive, suggesting that wealthier children do better in disadvantaged neighborhoods than others. Essentially, while everyone from disadvantaged neighborhoods is tend to have lower incomes, those with wealthier parents are not as penalized, suggesting a protective factor of wealthy parents exists. This confirms a "double jeopardy" hypothesis, as children from disadvantaged families and disadvantaged neighborhoods are likely to have the lowest incomes.

When I ran separate models for both genders, it is apparent that this double jeopardy situation is driven entirely by males, who are most effected by neighborhood context, disadvantage and advantage. The interaction between parent income and NDI is much larger than in the full model, and as Graph 2 shows, boys in the poorest neighborhoods but wealthiest families actually have the highest predicted mean incomes. This may be in part due to a small cell size, but nonetheless is an unexpected and intriguing finding. Perhaps these boys are able to combine the protective nature of their family background and the additional advantage to being relatively wealthy in an otherwise poor neighborhood to uniquely benefit from this type of situation.

Girls, on the other hand, are not as effected by neighborhoods, but when they are, their parental background interacts especially with NAI, unlike the male subsample. While the NDI interactions confirm a double jeopardy theory, the female NAI interaction suggests that poor women benefit more from contextual advantage than their wealthier neighbors. Advantage is associated with higher incomes for female adolescents, but the slope is larger for girls from poor families.

Conclusion

Parental socioeconomic background is important in determining young adults economic success. Building off of Blau and Duncan's traditional status attainment model (1967), I show that while a college education is important for higher incomes in early adulthood, a variety of other choices adolescents make while growing up, including participating in school activities, community service, and social networks, are both important for income attainment and associated with parental income level. As Lareau (2003) hypothesized, middle-class and upper class parents likely encourage and assist college attendance to build human capital, but also a variety of activities in youth that aid the formation of social capital, which is equally as important for future success.

While family and individual level factors certainly explain a large portion of income attainment, this analysis shows that neighborhood context and school qualities do have an additional effect on income attainment in early adulthood. Above and beyond individual characteristics, disadvantaged neighborhoods are associated with lower income attainment, while advantaged neighborhoods have a positive association with income levels in early adulthood. Because well off children are more likely to live in relative advantage, I argue that neighborhood selection is one way in which middle- and upper-parents pass on their high SES to their children. Conversely, children whose parents are unable to move out of disadvantage are even more likely to remain poor themselves.

The cross-level interaction effects between parent income and neighborhood reveal that the long-term effects neighborhoods have on their adolescent residents are not uniform, and vary by parental income status. Poor boys especially are especially negatively impacted as disadvantage increases, while wealthier boys are protected from the

consequences of living in disadvantage. On the other hand, poor girls disproportionately benefit from increasing neighborhood advantage. Further examination into these cross-level interactions and gender effects is needed, but nonetheless this analysis shows how neighborhood effects may not be the same across the board for all adolescents. In addition, these findings may only be applicable for income attainment in early adulthood. As such, further analysis would do well to continue to asses if income attainment in later life is as related to early life contexts and choices.

Policy to aid mobility would be well served to focus on encouraging low-income children to participate in these social capital building activities. While college graduation is undoubtedly a key factor in economic mobility, supporting other policy interventions that focus on building social capital as well as human capital can improve the economic attainment of adolescents. In addition, focusing these programs at the community level may be especially important, as neighborhood level disadvantage and advantage in adolescence are each associated with later life economic success. Finally, as these findings show, neighborhood context may impact boys and girls and adolescents of different socioeconomic backgrounds in different ways, and any intervention program would be wise to take this into account.

<u>Appendix?</u>

        To attempt to control for selection bias regarding neighborhood choice, I looked at parent's responses to why did they live in their current neighborhood. A variety of options are available for parents to choose including "because the schools here are better than they are in other neighborhoods" or "because there is less drug use and other illegal activity by adolescents in this neighborhood". Parents are also asked, "how disappointed would you be if [your child] did not graduate from college?", indicating their expectations for their child's education. Controlling for their answers to these types of questions can illuminate a better model of how neighborhood effects differ above and beyond observable parental characteristics, regardless of why a family moved to a neighborhood. When added to the fully adjusted models, none of these variables were correlated with my outcome variables or impacted the model significantly. As such, I do not include them in my final models, despite their theoretical implications.

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	Total	1st Quartile (lowest)	2nd Quartile	3rd Quartile	4th Quartile (highest)
	Mean	Mean	Mean	Mean	Mean
Dependent Variable					
Wave IV Income	65.395	48.721	61.228*	71.258*	79.388*
Main Explanatory Variable					
Parent Income	46.582	12.154	29.775*	49.106*	99.981*
Background Characteristics					
White	0.726	0.549*	0.692*	0.809*	0.829*
Black	0.150	0.293	0.165*	0.086*	0.079*
Asian	0.032	0.025	0.030	0.034	0.039
NA/Other	0.004	0.002	0.004	0.004	0.005
Hispanic	0.088	0.131	0.110	0.067*	0.048*
Two Parent Bio	0.605	0.311	0.570*	0.725*	0.779*
Two Parent, One non bio	0.175	0.170	0.187	0.178	0.162
Single Mom	0.184	0.448	0.202*	0.080*	0.041*
Single Dad	0.007	0.013	0.007	0.004	0.007
Other	0.028	0.057	0.034*	0.013*	0.012*
First Generation	0.033	0.058	0.038*	0.019*	0.022*
Second Generation	0.091	0.091	0.092	0.104	0.069
Third+ Generation	0.877	0.851	0.870	0.878	0.909*
Age (Wave IV)	28.096	28.146	28.015	28.106	28.130
Parent College	0.360	0.107	0.241*	0.422*	0.682*
Wave I					
In Degree Friend Nominations	4.725	3.994	4.369	5.055*	5.448*
No School Activities	0.191	0.245	0.232	0.162*	0.127*
4 or more School Activities	0.242	0.168	0.208*	0.257*	0.338*
Voluntary Community Service	0.423	0.333	0.385*	0.460*	0.512*
Wanted College	0.854	0.791	0.801	0.894*	0.926*
PVT Score	103.632	97.614	102.079*	105.909*	108.507*
Wave IV					
College Degree	0.351	0.164	0.234*	0.415*	0.596*
Ever Married	0.510	0.494	0.529	0.523	0.485
Neighborhood Variables					
NDI Wave I	1.067	2.099	1.205*	0.646*	0.441*
NAI Wave I	0.919	0.457	0.679*	1.070*	1.479*
School Variables					
New Teacher %	9.318	8.038	8.883	8.918	11.799
MA Teacher %	50.283	50.120	48.014	50.490	52.989
Urban	0.216	0.237	0.238	0.184	0.214
Suburban	0.592	0.541	0.550	0.640*	0.627
Rural	0.192	0.222	0.212	0.176	0.159
Small School	0.170	0.231	0.194	0.146*	0.110*
Medium School	0.495	0.488	0.511	0.503	0.472
Large School	0.335	0.281	0.295	0.351	0.418*

Table 1: Descriptive Statistics, for Total Sample and by Parental Income Quartile (N = 5,890)

* indicates statistically significantly from 1st quartile mean at p<.05

# Table 2: Regression of Wave IV Income Attainment on Individual and Contextual Level Variables

	Null	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Parent Income		0.0750**	0.0553**	0.0437*	0.0296	0.0192	0.0117	0.0186	0.00824	-0.0165	-0.0383
Female			-2.952*	-2.560	-4.930***	-6.521***	-6.624***	-6.534***	-6.655***	-6.497***	-6.598***
Black			-11.20***	-11.46***	-8.996***	-7.326***	-3.900*	-7.794***	-4.154*	-7.827***	-4.813**
Asian			10.14	9.186	8.957	9.905	11.54	9.525	11.68*	9.812	11.70
NA/Other			29.77**	32.84**	38.80**	39.59**	38.42**	39.41**	38.05**	40.11**	38.40**
Hispanic			-0.580	0.501	1.747	2.672	4.461	2.121	4.551	1.891	3.666
Age at Wave IV			1.459***	1.536***	1.769***	1.015*	1.128**	1.026*	1.155**	0.979*	1.144**
Step Parent			-6.264***	-5.238***	-4.073**	-3.689**	-3.681**	-3.655**	-3.590**	-3.647**	-3.573**
Single Mom			-11.29***	-10.29***	-9.620***	-9.192***	-9.131***	-9.405***	-8.385***	-9.660***	-8.800***
Single Dad			-22.80***	-22.36***	-21.19***	-15.30***	-15.23***	-15.23***	-14.36***	-14.99***	-13.97***
Other Family Structure			-11.53**	-9.621**	-5.641	-3.852	-3.687	-3.584	-3.094	-3.463	-2.785
First Generation			3.888	3.421	6.294	3.810	4.586	2.957	4.576	2.618	3.230
Second Generation			4.245	4.006	4.309	3.638	3.807	3.479	4.024	3.333	3.447
Parent College Degree				7.683***	3.302	0.853	-0.138	0.673	-0.328	0.781	-0.326
PVT Score					0.163**	0.125	0.111	0.125	0.106	0.121	0.104
In degree friend nominations					1.049***	0.943***	0.937***	0.981***	0.914***	0.975***	0.940***
No School Activities					-4.714***	-3.590**	-4.079**	-3.923**	-3.877**	-3.911**	-4.067**
4 or more School Activities					7.945***	6.930***	6.528***	7.020***	6.544***	6.962***	6.530***
Voluntary Community Service					7.710***	5.658***	5.723***	5.759***	5.658***	5.818***	5.850***
Wanted College					7.259***	5.986***	5.803***	5.697***	5.956***	5.740***	5.733***
Ever Married						10.37***	10.47***	10.54***	10.48***	10.58***	10.74***
College Degree						12.34***	12.02***	12.19***	11.94***	12.23***	11.77***
NDI Wave I							-1.568***		-2.573***		-2.234***
NAI Wave I							2.092***		2.353**		2.690**
Urban								7.900**		7.678**	7.193**
Suburban								7.026***		6.905***	5.372**
New Teacher %								-0.0441		0.0679	0.000979
MA Teacher %								-0.0262		-0.0621	-0.0667
Medium School								3.688		3.632	2.153
Large School								5.651*		5.811*	3.250
NDI x Parent Income									0.0337**		0.0277*
NAI x Parent Income									-0.00323		-0.0126
MA Degree Teacher % x Parent Income										0.000960	0.00150*
New Teacher % x Parent Income										-0.00204*	-0.00161
Constant	62.77***	59.53***	26.39*	21.47	-15.69	4.080	3.100	-2.071	2.920	0.742	0.587
Rho (ICC)	0.0673	0.0559	0.0413	0.037	0.0317	0.0378	0.0267	0.0289	0.0269	0.0282	0.0218
Comparison to previous model											
Chi-square		6.30**	142.39***	6.85***	88.04***	31.82***	21.16***	37.62***	6.97**	5.46*	14.56**

Table 3: Sex Differences in Contextual Effects

	Model 6		Model 7		Model 8		Model 9		Model 10	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Parent Income	0.00783	0.0245	0.0122	0.0376	0.0592	-0.0617	-0.00533	0.0132	0.00958	-0.0662
NDI Wave I	-2.114***	-1.101*			-1.688**	-3.618***			-1.113	-3.594***
NAI Wave I	0.295	4.423***			1.563	3.510**			1.772*	3.381**
Urban			7.788**	5.839			7.523**	5.778	8.080**	4.962
Suburban			10.16***	3.732			10.09***	3.699	9.291***	1.934
New Teacher %			0.0430	-0.0970			0.164	0.00212	0.0977	-0.102
MA Teacher %			-0.0777*	0.0337			-0.105*	0.0107	-0.107*	0.0231
Medium School			3.680	4.015			3.562	4.047	2.148	1.916
Large School			4.909	6.888*			4.998	7.139*	3.134	3.569
NDI x Parent Income					-0.00830	0.0798***			-0.0135	0.0778***
NAI x Parent Income					-0.0227**	0.0204			-0.0278***	0.0173
MA Degree Teacher % x Parent Income							0.000727	0.000651	0.00145	0.000307
New Teacher % x Parent Income							-0.00231*	-0.00173	-0.00176	-0.000833
Constant	-11.78	11.83	-22.33	13.70	-13.85	17.04	-20.76	16.05	-19.95	16.61

+All models adjust for sociodemographic background characteristics, Wave I mechanisms and Wave IV mechanisms

Figure 1: Mediating Mechanisms in the Intergenerational Transmission of SES
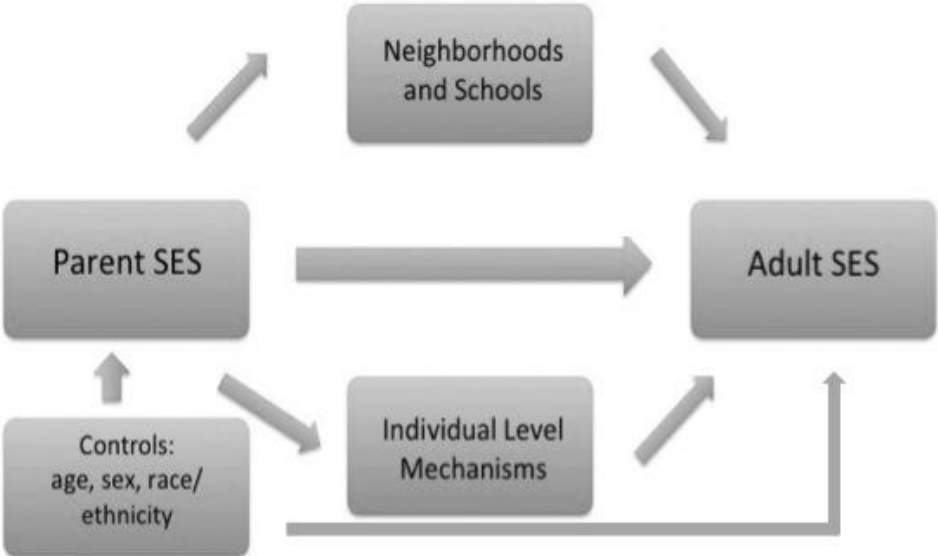
Figure 2: Neighborhoods and Schools also Moderate the Transmission of SES
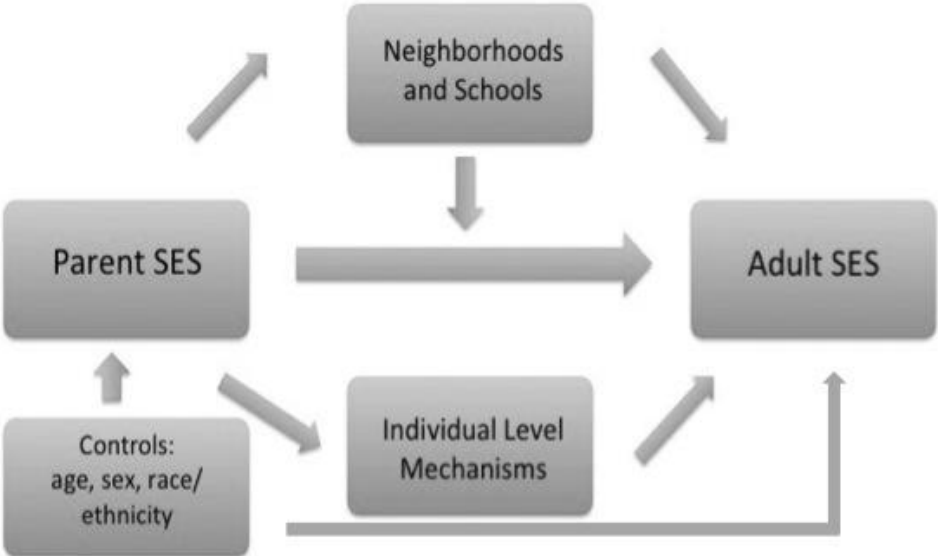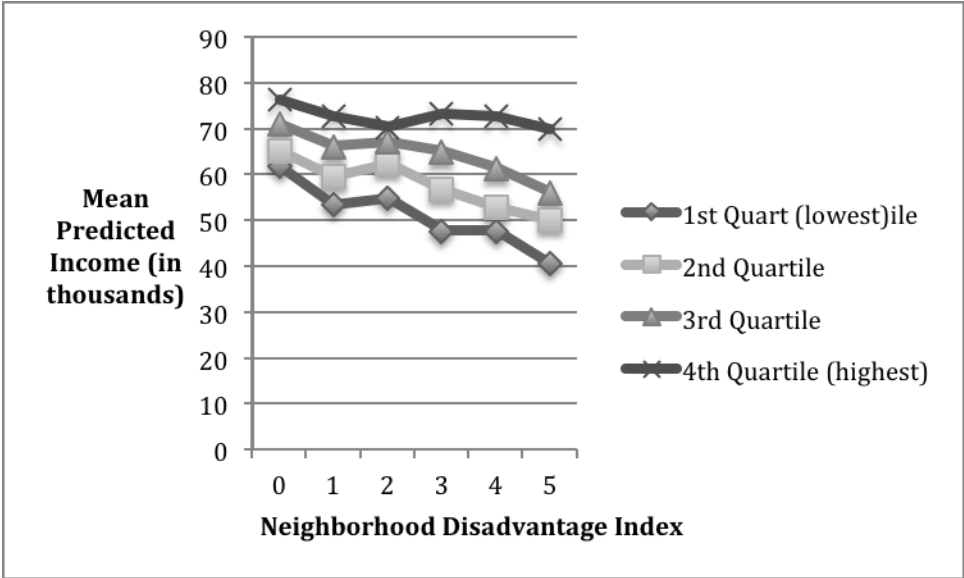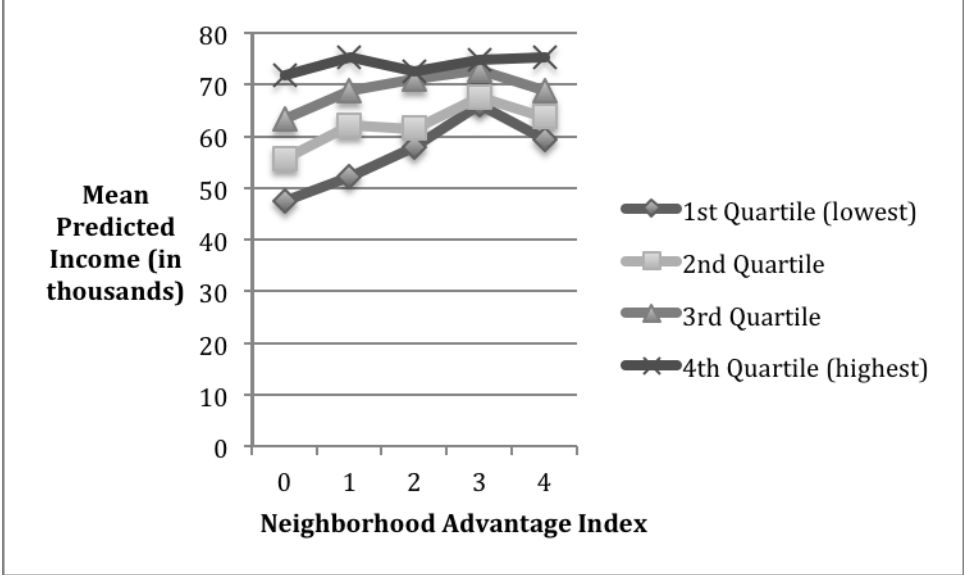
Figure 3: Full Model NDI Interaction Effect on Predicted Income, by Parental Income Quartile and Neighborhood Disadvantage Index

Figure 4: Female NAI Interaction Effect on Predicted Income, by Parental Income Quartile and Neighborhood Advantage Index

Figure 5: Male NDI Interaction Effect on Predicted Income, by Parental Income Quartile and Neighborhood Disadvantage Index