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ALL IN THE EXTENDED FAMILY:
GRANDPARENTS, AUNTS, AND UNCLES AND EDUCATIONAL ATTAIINMENT*

Abstract

Previous work on social interactions has analyzed the effects of nuclear family, peer, school, and neighborhood characteristics. This paper complements this research by first showing that individuals from similar nuclear families often differ in extended family member characteristics. It then demonstrates that older extended family members - aunts, uncles, and grandparents – independently affect college attendance probabilities and test score results of their younger relatives. In some cases, the sizes of the estimated effects are large enough to substantially narrow the achievement gap between disadvantaged and other youth.

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I. Introduction

While a substantial body of previous research analyzes the relationship between family background and schooling, the influences of extended family members have received little attention. Extended family members can affect schooling by serving as role models, by sanctioning or encouraging particular patterns of behavior, and by introducing adolescents to experiences and interactions not available elsewhere (Cochran and Brassard, 1979).

This paper shows that older extended family members - aunts, uncles, and grandparents – independently affect the schooling of their younger relatives. This means that previous research focusing only on nuclear family, peer, school, and neighborhood characteristics may not include some important social interactions that alter adolescent behavior. For example, youths from low socioeconomic status families may stay in school longer and have higher test scores if they have more educated extended family members. On the other hand, countervailing extended family influences may lower gains for disadvantaged adolescents in high income neighborhoods and schools.

II. Literature Review

The effects of extended family members on schooling fit into economic models of social interactions. In addition to individual utility from the usual set of personal choices and characteristics, these models include social utility due to norms, identity, or expectations about others' actions.

In some cases, social utility comes from information that individuals gain about alternative choices. Manski (2004) shows that younger cohorts can learn from their predecessors when the distribution of outcomes (for example, earnings) resulting from particular actions (for example, schooling) is initially unknown. If outcome distributions are similar over time, observations of previous cohorts provide information that narrows the range of distributions later generations regard as feasible.

This research implies that extended family members have a larger effect on adolescents when the information conveyed more substantially reduces uncertainty. Gender differences in the occupational distribution imply that grandfathers and uncles would exert greater influence on male adolescents and grandmothers and aunts would have a larger effect on females. In addition, dramatic changes in the role of

women in the labor market imply that grandmothers would provide less pertinent information to granddaughters about educational and career futures than grandfathers would provide for grandsons. In 1960, when many grandmothers for the recent generation of adolescents were themselves young, the labor force participation rate for women ages 25-29 was 35 percent and 40 percent of all working women were employed in just 10 occupations. In 2000, labor force participation rate for women ages 25-29 was 77 percent and only 24 percent of working women were employed in same 10 occupations[1]. Goldin (2006) described change from "jobs" to "careers" that began in the late 1970s as revolutionary.

Besides information gains, social utility can also come from conforming to the behavior of significant others. According to Akerlof (1997), individuals make decisions about schooling based partly on the cost of deviating from the behavior of those closely related to them. This cost increases with higher values of social exchange and lower initial social distance between the individual and his significant others. In Akerlof and Kranton (2000), utility gains or losses from identity depend on how well behavior corresponds to the ideal for the individual's social category type.

The sociology and psychology literatures discuss more details about social exchange with adult extended family members. While adult extended family members make up an important part of even young children's networks (Feiring and Lewis, 1988), the type of interactions with extended family members changes as children grow older. Benson (1993) reported that in-depth conversations with non-parental adults increased from 26% for sixth-graders to 39% for ninth-graders and 60% for twelfth-graders. Case studies from Ianni (1989) found "considerable evidence of turning to adults from information, validation, and guidance for the future" (p. 86) from early to middle adolescence.

The type of social exchange with adult extended family members may also differ by gender. Blyth and Foster-Clark (1987) measured intimacy between adolescents and older extended family members by "how much do you go to this person for advice", "how much does this person accept you no matter what you do", "how much does the person understand what you're really like", and "how much do you share your inner feelings with this person". Boys and girls were equally likely to include extended family adult males (58

percent) as intimates. However, girls were more likely to include extended family adult females (75 versus 57 percent).

In Blythe, Hill, and Thiel (1982), a sample of seventh through tenth graders were asked to list important people in their lives. These included "people you spend time with or do things with", "people you like a lot or who like you a lot or both", "people who make important decisions about things in your life", "people who you go to for advice", or "people you would like to be like". Seventy percent of the boys and 79 percent of the girls listed at least one adult extended family member. For girls, the number of female adult extended family members who were important others (1.63) was substantially higher than male number (1.04). For boys, the number of male adult extended family members who were important others (1.08) was the same as the number of females (1.06).

Gender differences in relationships with extended family members may follow those with mothers and fathers. According to Youniss and Smollar (1985), sons frequently choose fathers as the person with whom they would most likely discuss career goals, hopes and plans for the future, doubts about their abilities, and fears about life. On the other hand, over 50 percent of daughters chose fathers as the person they would be least likely to talk to about doubts about their abilities, problems at school, or fears about life. In addition, many more daughters listed "nothing" as the activity they liked best with fathers (27 percent) than they did with mothers (7 percent). Daughters engaged in more intimate social interaction (such as going places together and talking together) with mothers than with fathers. Daughters chose mothers most often as the person they would be likely to talk to about career goals.

The effects of family background on adolescent schooling can be represented as follows:

(1) $Y = \beta_A' X_A + \beta_U' X_U + \beta_M' X_M + \beta_O' X_O + Z_P + Z_C + \varepsilon$

where Y measures educational attainment, X_A equals schooling of aunts and grandmothers, X_U equals schooling of uncles and grandfathers, X_M is mother's years of schooling, and X_O equals other observed background variables. The Z_P and Z_C are unobserved parent and community characteristics respectively. According to the research on uncertainty and conformity discussed above, both β_A and β_U should be larger for later compared to

earlier educational attainment. In addition, β_A should be larger for females, β_U should be larger for males, and the effects of grandmothers on granddaughters should be lower than the effects of grandfathers on grandsons.

III. Data and Empirical Results

This paper uses data from National Longitudinal Survey of Youth (NLSY) and from the Children of the National Longitudinal Survey of Youth (CNLSY). The NLSY is a nationally representative panel of 12,686 individuals ages 14-22 in 1979 who were interviewed annually to determine information about schooling, work, and other experiences. Beginning in 1986, the CNLSY collected information annually or biennially on children of the original female NLSY respondents. The entire CNLSY sample includes individuals up to age 32 in 2002. The analysis in this paper is restricted to CNLSY sons and daughters were ages 19-26 to reduce the overrepresentation of children who were born to younger mothers. The sample children were age 3 at most in 1979 when NLSY members were ages 14-24[2].

This paper estimates the effects of extended family member schooling on educational attainment of CNLSY members. Educational attainment was measured by whether the individual had attended college by 2002, by combined percentile scores for reading and math tests taken at age 14 and by combined test scores at age 10. Information about grandparents, aunts, and uncles and some of the other background characteristics was obtained through mother's interviews as part of the NLSY. No information was available about extended family members on the father's side.

Table 1 lists means and standard deviations of education attainment and extended family variables. About 31 percent of sons and daughters attended college. They average 102 and 95 points on the age 14 and age 14 tests respectiviely. Roughly half of grandparents had at least 12 years of schooling[3]. The mean number of aunts and uncles with less than 12 years of schooling was about 0.45 each. The mean numbers of aunts and uncles with 12 or more years of schooling were 1.4 and 1.3 respectively.

Table 1 also indicates that low years of parent's schooling do not uniformly imply low years of schooling for extended family members. For example, if mothers had less than 12 years of schooling, about one-fifth of grandparents had graduated from high school and the average number of aunts and uncles with 12

or more years of schooling was roughly one. Similarly, high years of parent's schooling do not uniformly imply high years of schooling for extended family members. If mothers had more than 12 years of schooling, about 60 percent of grandparents had graduated from high school and the average number of aunts and uncles with less than 12 years of schooling was about one-fifth.

Table 2 provides an example showing that extended family characteristics may substantially change educational outcomes. CNLSY sons whose grandfathers had at least 12 years of schooling were 17 percentage points more likely to attend college. This gap is large relative to the overall fraction of sons (28 percent) who attended college.

Table 2 suggests that the correlation between nuclear and extended family characteristics may not account for all of this variation. Differences within mother's schooling groups are similar to the overall gap. Sons with high school dropout mothers were 15 percentage points more likely (0.266-0.111) to attend college if their grandfathers had at least 12 years of schooling. Sons with college-educated mothers were 15 percentage points more likely (0.447-0.297) to attend college if their grandfathers had at least 12 years of schooling[4].

Not all gaps were equally large. College attendance differences by grandmother's schooling were smaller for both sons and daughters. College attendance differences for daughters by grandfather's schooling were smaller than those reported above for sons. Similar calculations can be made for age 14 and age 10 test scores[5].

Table 3 lists results if a commonly-used set of nuclear family characteristics are included in the probit college attendance and OLS test score analyses. Each additional year of mother's schooling increased the likelihood of college attendance by roughly 3 percentage points for both sons and daughters. Each additional year that the family received AFDC had a somewhat smaller impact. The effect of father's schooling on college attendance was higher for sons. The effect of living in two-parent families was larger for daughters. Test score results for age 10 and age 14 were quite similar. Each year of mother's education added 3.6 to 5.6 points to test scores. Each year of father's education added 2.7 to 3.9 points to test scores. African-Americans scored substantially lower than whites. More siblings and AFDC receipt also lowered test scores.

Table 4 shows the results from adding schooling of extended family members, mother's Air Forces Qualifying Test scores (AFQT) and HOME Inventory scores to the analyses[6]. Compared to those with less well-educated grandfathers, CNLSY sons whose grandfathers had at least 12 years of schooling were 13 percentage points more likely to attend college and scored 10 points higher on the age 14 tests (out of a 200 point total possible). While these effects are slightly smaller than those in Table 2, they imply that the large differences reported in Table 2 do not result mainly from differences in these observed nuclear family characteristics.

Other results in Table 4 indicate that the number of aunts who were high school dropouts significantly lowered the probability of CNLSY daughters attending college (9 percentage points) and the number of uncles who graduated from high school significantly raised age 14 test scores for sons (3 points). All of the college attendance and age 14 test score results in Table 4 are consistent with hypothesized gender differences in social interaction. Uncles and grandfathers had larger effect on sons and aunts had larger effects on daughters[7].

One striking finding in Table 4 is the large effect of grandfathers on college attendance and age 14 test scores for sons compared to the insignificant effect of grandmothers on daughters. As indicated earlier, differences in the information conveyed about the schooling and careers between generations may explain this gap. These gender-specific effects are consistent with some related research. Benin and Johnson (1984) reported that the correlation in educational attainment between older and younger brothers was higher than that between older and younger sisters. Loury (2006) showed that young men who found their jobs through older male relatives had higher earnings. However, the same did not apply for young women who found their jobs through older female relatives.

Blacks and whites are included together in these analyses since racial differences in the effects of extended family members were small[8]. In addition, extended family members did not account for differences in educational outcomes between blacks and whites. Holding constant HOME Inventory and mother's AFQT scores, the dummy variables for whether black remained the same in analyses that included or excluded extended family members' schooling[9].

Interpreting the estimated effects in Table 3 is not straightforward since the included parents' and extended family schooling variables may merely measure the impact of unobserved parent and community characteristics (Z). In particular,

(2) $E(\beta_A) = \beta_A + \sigma_{AP} + \sigma_{AC}$

(3) $E(\beta_U) = \beta_U + \sigma_{UP} + \sigma_{UC}$

(4) $E(\beta_M) = \beta_M + \sigma_{MP} + \sigma_{MC}$

where σ_{jk} are the correlations between j's schooling and Z_K holding constant the other variables included in equation (1).

More detailed analyses of the coefficients in Table 3 imply that the biases in the estimated effects of the extended male family member for sons are likely to be small. The first such analysis rests on (1) the estimated effects of mother's schooling are small ($E(\beta_M) = \beta_M + \sigma_{MP} + \sigma_{MC}$) and (2) the estimated effects of mother's schooling are larger than the bias in grandfather and uncle schooling ($\beta_M+\sigma_{MP}+\sigma_{MC}>\sigma_{UP}+\sigma_{UC}$).

The Table 3 large effects of mother's schooling on son's later educational attainment (whether attended college and age 14 test scores) dropped to insignificance in Table 4 when mother's Armed Forces Qualifying Test (AFQT) and HOME Inventory scores were included in the analysis. The coefficients fell partly because parent characteristics such as mother's and father's schooling proxy for many family characteristics that the HOME Inventory measures directly. The HOME Inventory gauges the amount and quality of the stimulation and support in the child's family environment (Bradley et al, 2000). These includes indicators of the physical environment, learning materials, modeling, instructional activities, regulatory activities, variety of experience, acceptance and responsivity in the child's home.

The effects of mother's scores on the Armed Forces Qualifying Test can be interpreted in a similar way. Currie and Thomas (1999) found that both mother's AFQT scores and mother's family background had large positive effects on their children's Peabody Picture Vocabulary Test (PPVT) scores. However, when they compared PPVT scores of children whose mothers are sisters (and thus shared the same family background while growing up), they find a negative and insignificant relationship between mother's AFQT and the child's

PPVT. One interpretation of this result is that AFQT measures family background differences in models that use imperfect background proxies (see also Heckman, 1995 and Neal and Johnson, 1996). Similarly, the large estimated coefficients for AFQT and HOME scores combined with insignificant effects of mother's schooling in Table 4 imply that HOME Inventory and mother's AFQT scores include all of the family background effects previously measured by mother's schooling in Table 3.

Not only is the estimated effect of mother's schooling ($\beta_M+\sigma_{MP}+\sigma_{MC}$) small, but it is larger than the bias in grandfather and uncle schooling ($\sigma_{UP}+\sigma_{UC}$)[10]. Since family choice of neighborhood is partly determined by observed parent's characteristics, the correlation between mother's schooling and unobserved community characteristics (σ_{MC}) would be relatively large. On the other hand, given that extended family members generally do not live in the same neighborhoods (see Logan and Spitze, 1994), the correlation between extended family member schooling and community unobservables (σ_{UC}) would probably be much smaller. In addition, mother's schooling is more highly correlated with her own unobserved characteristics and those of her spouse (as measured by σ_{MP}) than is the schooling of her male relatives (as measured by σ_{UP}). These two observations imply that $\sigma_{MP}+\sigma_{MC} > \sigma_{UP}+\sigma_{UC}$ and, therefore, $\beta_M+\sigma_{MP}+\sigma_{MC} > \sigma_{UP}+\sigma_{UC}$. Since $\beta_M+\sigma_{MP}+\sigma_{MC}$ is not significantly different from zero in Table 3 and since $\beta_M+\sigma_{MP}+\sigma_{MC} > \sigma_{UP}+\sigma_{UC}$, the biases in the effects of grandfather and uncle schooling ($\sigma_{UP}+\sigma_{UC}$) are small.

The second analysis supporting small bias for sons is based on assuming that either no age-specific or male-specific sources of the bias. The results for tests at age 10 and at age 14 reveals no age pattern in the effects of observed variables (parents' schooling, number of years received AFDC, mother's AFQT score, HOME Inventory score) and no statistically significant differences across age groups. If the correlation between the extended family schooling and unobservables similarly does not systematically increase as sons and daughters grow older, then the size of the bias in early education coefficients would equal the bias for later educational attainment. According to Table 4, the estimated effects of extended family member schooling, $\beta_U+\sigma_{UP}+\sigma_{UC}$, and thus $\sigma_{UP}+\sigma_{UC}$ are both small for age 10 test scores. If the bias does not increase with age, then the bias for age 14 test scores and for college attendance would also be close to zero.

A similar argument applies in the absence of male-specific correlations between extended family variables and parent unobservables. That is, if σ_{UP} for daughters is not significantly different from σ_{UP} for sons, the small effects estimated effects of grandfathers and uncles on daughters in Table 4 would similarly imply no bias in their effects on sons. Male-specific correlations are not present in the analysis because (1) data is available only on the grandfathers and uncles from the mother's family and (2) the mother's characteristics would not include male-specific unobservables common only to men in her family.

The third argument supporting small bias for sons comes from examining estimated effects for those whose grandfathers were dead as of 1979 or whose mothers lived in a different state as adults than the one where they grew up. These adolescents would have had little or no contact with grandfathers that would affect their behavior. Any estimated effects from these grandfathers would merely measure spurious correlation with unobservables. The coefficient for absent grandfathers in the college attendance analysis was significantly smaller at -0.097 (0.192) than that for grandfathers living near their grandsons at 0.442 (0.132). This implies that grandfathers had no effect on grandsons unless they had opportunities to interact. Comparisons for the other significant effects for sons in Table 4 yield similar qualitative results. However, the coefficients for those likely to have little contact were not precisely estimated.

The evidence of small bias in the estimated values of the aunts on college attendance for daughters is less persuasive than the extended family effects for sons. It is based on assuming that the bias does not growth with age. In this case, the small estimated effects of aunt's schooling for age 10 test scores would imply little bias for later schooling. The other arguments for sons do not apply for daughters. Mother's schooling remains significant at the 10 percent level for daughters in Table 4. In addition, when mothers lived in a different state as adults than the one where they grew up, the effects of aunts are similar to the effects of aunts when mothers did not move out of state[11].

IV. Discussion

The results in this paper have implications for related research. For example, estimates of the overall effects of background on men's schooling based on nuclear family, peer, and neighborhood characteristics alone

underestimate the overall effect of social interactions. For example, while the fraction of the variance in college attendance accounted for by observed background characteristics is small in this analysis, adding extended family variables raised this fraction by one-third. The pseudo-R^2 increased to 0.084 from 0.063 in the college attendance probit[12].

In addition, the results in this paper indicate that sibling correlations in college attendance may understate family effects if brothers and sisters are grouped together[13]. Due to grandfather and uncle effects, brothers share more similarities among themselves than with sisters. Using sibling differences to control for unobserved family characteristics would then be valid only within gender groups or only for educational attainment at younger ages.

The paper also points to potential importance of non-spatial aspects of networks. Participants in the *Moving To Opportunity* Experiment were moved to neighborhoods with lower poverty rates to improve socioeconomic outcomes for adults and children. Social interactions with extended family members, not based on immediate proximity, may remain important and act as a drag on potential gains from improved neighborhoods. These continuing connections may partly account for insignificant gains in educational achievement for experiment participants (Sanbonmatsu, Kling, Duncan, Brooks-Gunn, 2006).

In different contexts, a review of mentoring programs (DuBois et al, 2002) and a review of programs to limit second births among welfare mothers (Loury, 1999) found that successful ventures mimic some characteristics of relationships with extended family members. Mentoring programs with support for parental involvement and with expectations of frequent contacts generated more positive adolescent outcomes. Home visitation by nurses was the only pregnancy prevention program that consistently resulted in fewer subsequent births to welfare mothers. Part of the success of the program was attributed to empathetic relationship that the nurses explicitly developed with the mother and other family members. The home visitation outcomes contrast with the negligible impact of other approaches which relied on direct or indirect monetary incentives to avoid future pregnancies and of the typical case management approach which simply provided information about birth control and which included only limited contact between case workers and clients.

More generally, the results in the paper suggest that one approach to successful interventions in the lives of adolescents hinges on creating relationships similar to those maintained by older extended family members. The results also suggest that such interventions may substantially alter adolescent outcomes.

V. Summary

Previous research on background characteristics concludes that family history matters. This paper indicates that this history encompasses more than parents' characteristics. Table 1 shows that individuals from similar nuclear families often do not have the same extended family member characteristics. Table 4 reports gender-matched effects of extended family member schooling on adolescence educational attainment. In some cases, the sizes of the estimated effects are large enough to substantially narrow the achievement gap between disadvantaged and other youth. Furthermore, the difference analyses indicate that the estimated effects for sons result from contact with extended family members and not from spurious correlation with unobservables.

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Footnotes

[1] U.S. Bureau of the Census. U.S. Census of Population: 1960. Subject Reports, *Employment Status and Work Experience*. Table 1. U.S. Bureau of the Census. U.S. Census of Population: 1960. Subject Reports, *Occupational Characteristics*. Table 1. These occupations included bookkeeper, cashier or sales clerk, elementary school teacher, nurse, office machine operator, private household workers, secretary, telephone operator, typist, and waitress.

[2] The results reported later are not sensitive to sample characteristics. The results are similar if the sample is restricted to younger sons and daughters.

[3] Years of schooling was unknown for 7 percent of grandmothers and 15 percent of grandfathers. Those with missing data are included in the left-out category. Means and standard deviations of variables not included in Table 2 are available from the author.

[4] Differences within mother's schooling are smaller than overall differences. Those at each extreme (high mother and grandparent schooling, low mother and grandparent schooling) are more numerous and contributed a greater weight to the overall results than those between the extremes.

[5] Higher grandparent schooling was associated with lower college attendance rates for daughters with college-educated mothers. However, the differences were not significant.

[6] The coefficients for the dummy variable whether black became less negative between Table 3 and Table 4 for both sons and daughters. Adding mother's AFQT scores to the analysis accounted for this change.

[7] In analysis not shown here, the sample was restricted to individuals less than age 23 to reduce the disproportionate sampling of those with relatively young mothers. These individuals were not born as of 1979, the first NLSY sample year. The results are similar to those reported here. The male college attendance and age 14 test score coefficients for grandfather 12 or more years of schooling were 0.310 (0.154) and 9.338 (4.247) respectively. The male age 14 test score coefficient for number of uncles with 12 or more years of schooling was 2.753 (1.457). The female college attendance coefficient for number of aunts who were high school dropouts was -0.176 (0.075).

[8] For example, the coefficients of the interaction between grandfather schooling and whether black were 0.0081 (0.2159) for the college probit and 0.5627 (6.2027) for age 14 test scores.

[9]Excluding extended family characteristics, the college attendance coefficients for the black dummy variables were -0.067 (0.129) for sons and 0.239 (0.114) for daughters. Excluding extended family characteristics, the age 14 test score coefficients for the black dummy variables were -20.836 (3.925) for sons and -15.062 (3.300) for daughters. These are virtually identical to the coefficients in Table 4.

[10] This is strictly true when mother's schooling is measured in units comparable to those of extended family member schooling e.g. dummy variables for different levels of mother's schooling. The qualitative analysis is the same if dummy variables are used for mother's schooling instead of mother's years of schooling.

[11] Schooling data is only available for living aunts.

[12] With 48,634 observations the pseudo-R^2 for college enrollment in Black and Sufi (2002) was 0.14.

[13] Solon, Page, and Duncan (2000) combine females and males to compute sibling correlations for total years of schooling. This may be invalid for focusing on sibling correlations in college attendance.

Table 1. Means and Standard Deviations of Educational Attainment and Selected Extended Family Characteristics by Mother's Schooling

Variables	All	Mother: high school dropout	Mother: 12 years of school	Mother: attended college
Whether attended college	0.3113 (0.4631)	0.1934 (0.3954)	0.2903 (0.4541)	0.4442 (0.4973)
Age 14 test scores	101.6136 (46.6278)	77.1693 (45.2212)	102.9399 (44.8196)	116.8506 (43.9990)
Age 10 test scores	94.7144 (56.4599)	73.5025 (53.2445)	93.7776 (55.8475)	112.1578 (54.3987)
Whether grandfather ≥12 years of schooling	0.4446 (0.4972)	0.2311 (0.4219)	0.4147 (0.4929)	0.6016 (0.4900)
Whether grandmother ≥12 years of schooling	0.4586 (0.4985)	0.2057 (0.4046)	0.4664 (0.4991)	0.6314 (0.4829)
Number of aunts who were high school dropouts	0.4714 (0.8952)	0.9412 (1.1891)	0.4360 (0.8684)	0.1844 (0.5525)
Number of aunts with ≥12 years of schooling	1.3956 (1.3340)	1.0669 (1.1591)	1.4790 (1.3184)	1.5552 (1.3642)
Number of uncles who were high school dropouts	0.4395 (0.8935)	0.9563 (1.2604)	0.3874 (0.8704)	0.2311 (0.6105)
Number of uncles with ≥12 years of schooling	1.3520 (1.3321)	0.9350 (1.0911)	1.3860 (1.3277)	1.4708 (1.2768)

Estimates are weighted using 2002 NLSY child sampling weights

Table 2. Means and Standard Errors for College Attendance by Extended Family Characteristics

Variables	All	Mother: high school dropout	Mother: 12 years of school	Mother: attended college
Men				
Grandfather schooling ≥12 years	0.377 (0.026)	0.266 (0.073)	0.350 (0.035)	0.447 (0.044)
Grandfather schooling <12 years or unknown	0.203 (0.015)	0.111 (0.022)	0.214 (0.022)	0.297 (0.040)
Grandmother schooling ≥12 years	0.330 (0.024)	0.182 (0.066)	0.291 (0.032)	0.420 (0.041)
Grandmother schooling <12 years or unknown	0.239 (0.017)	0.146 (0.025)	0.252 (0.024)	0.346 (0.044)
Women				
Grandfather schooling ≥12 years	0.390 (0.026)	0.361 (0.079)	0.349 (0.034)	0.462 (0.043)
Grandfather schooling <12 years or unknown	0.311 (0.017)	0.199 (0.025)	0.286 (0.024)	0.549 (0.039)
Grandmother schooling ≥12 years	0.391 (0.024)	0.291 (0.065)	0.357 (0.034)	0.471 (0.040)
Grandmother schooling <12 years or unknown	0.304 (0.017)	0.214 (0.027)	0.273 (0.023)	0.550 (0.042)
N	2193	525	1110	558

Estimates are weighted using 2002 NLSY child sampling weights

Table 3. Estimated Effects of Nuclear Family Background on Adolescent Educational Achievement

	Probit whether attended college		OLS test score at age 14		OLS test score at age 10	
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Male	Female	Male	Female	Male	Female
Mother's years of schooling	0.0842 (0.0308) {0.0279}	0.1023 (0.0286) {0.0372}	5.3082 (0.9717)	3.6177 (0.8229)	5.4678 (1.1178)	5.5616 (1.1773)
Father's years of schooling	0.0559 (0.0264) {0.0185}	-0.0043 (0.0245) {-0.0015}	2.9675 (0.7868)	3.9014 (0.6349)	3.1954 (1.0368)	2.7296 (0.9508)
Whether black	-0.2333 (0.1159) {-0.0736}	0.0242 (0.1016) {0.0088}	-34.3783 (3.6683)	-26.7004 (3.1379)	-26.4973 (4.6299)	-19.7098 (4.1119)
Number of years in 2-parent family during ages 5-15	0.0027 (0.0139) {0.0009}	0.0277 (0.0132) {0.0101}	0.0772 (0.4465)	0.3604 (0.3942)	-0.3078 (0.5068)	0.4096 (0.5346)
Number of siblings	-0.0367 (0.0440) {-0.0121}	-0.0160 (0.0404) {-0.0058}	-2.0008 (1.5048)	-2.6314 (1.1521)	-1.0002 (1.8680)	-1.3123 (1.5971)
Number of years family received AFDC during ages 5-15	-0.0577 (0.0279) {-0.0191}	-0.0855 (0.0257) {-0.0311}	-3.3959 (0.7989)	-1.2731 (0.7253)	-4.4195 (0.9387)	-1.5273 (0.9551)
Constant	-2.1598 (0.4250)	-1.6511 (0.4006)	16.1567 (13.8706)	20.5749 (11.5917)	2.2396 (16.3425)	1.9468 (18.0050)
N	1042	1151	1014	1124	1014	1124
χ^2	39.32	50.58				
R^2			0.2319	0.2033	0.1547	0.1165

Estimates are weighted using 2002 NLSY child sampling weights. The terms in the brackets { } reports the effect of a one-unit change in the explanatory variable on the probability of college attendance.

Table 4. Estimated Effects of Nuclear and Extended Family Background on Adolescent Educational Achievement

	Probit whether attended college		OLS test score at age 14		OLS test score at age 10	
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Male	Female	Male	Female	Male	Female
Mother's years of schooling	0.0288 (0.0356) {0.0094}	0.0526 (0.0314) {0.0189}	0.3748 (1.0868)	0.5829 (0.8959)	0.9029 (1.3266)	2.9946 (1.4198)
Father's years of schooling	0.0305 (0.0274) {0.0099}	-0.0340 (0.0256) {-0.0122}	1.9754 (0.8225)	2.6708 (0.6519)	2.4659 (1.0592)	1.5470 (0.9882)
Whether black	-0.0396 (0.1332) {-0.0128}	0.2380 (0.1158) {0.0878}	-20.9931 (3.8963)	-15.1913 (3.3734)	-15.5770 (4.9491)	-9.2635 (4.6352)
Number of years in 2-parent family during ages 5-15	-0.0083 (0.0144) {-0.0027}	0.0132 (0.0136) {0.0047}	-0.3830 (0.4348)	-0.3036 (0.3927)	-0.7366 (0.4999)	-0.1375 (0.5633)
Number of siblings	-0.0481 (0.0448) {-0.0157}	-0.0040 (0.0407) {-0.0014}	-2.8853 (1.4251)	-2.7668 (1.1106)	-1.8252 (1.8661)	-1.1446 (1.5599)
Number of years family received AFDC during ages 5-15	-0.0274 (0.0291) {-0.0089}	-0.0572 (0.0265) {-0.0205}	-1.7570 (0.7777)	-0.0579 (0.6879)	-2.9340 (0.9571)	-0.5853 (0.9221)
HOME Inventory Score	0.0070 (0.0021) {0.0023}	0.0081 (0.0020) {0.0029}	0.2358 (0.0662)	0.2450 (0.0543)	0.2210 (0.0810)	0.2090 (0.0779)
Mother's AFQT score	0.0034 (0.0027) {0.0011}	0.0067 (0.0026) {0.0024}	0.5683 (0.0824)	0.4387 (0.0827)	0.5314 (0.1093)	0.3295 (0.1154)
Whether grandfather ≥12 years of schooling	0.4011 (0.1227) {0.1317}	-0.0926 (0.1139) {-0.0331}	10.0259 (3.8250)	-2.5168 (3.3486)	-1.9790 (4.9549)	-0.3394 (4.6172)
Whether grandmother ≥12 years of schooling	-0.1616 (0.1250) {-0.0523}	-0.0338 (0.1135) {-0.0121}	-8.8111 (3.6598)	5.5712 (3.5501)	-1.4834 (4.9883)	5.3822 (4.7765)

Table 4. Estimated Effects of Nuclear and Extended Family Background on Adolescent Educational Achievement (cont.)

	Probit whether attended college		OLS test score at age 14		OLS test score at age 10	
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Male	Female	Male	Female	Male	Female
Number of aunts who were high school dropouts	-0.0940 (0.0730) {-0.0306}	-0.2535 (0.0639) {-0.0910}	0.9882 (2.2405)	-0.2363 (1.6993)	0.1159 (2.6589)	0.8705 (2.2475)
Number of aunts with ≥12 years of schooling	-0.0242 (0.0489) {-0.0079}	-0.0381 (0.0443) {-0.0137}	0.4140 (1.5054)	-0.6991 (1.2977)	2.3620 (1.9265)	-1.7780 (1.6939)
Number of uncles who were high school dropouts	-0.0202 (0.0757) {-0.0066}	0.0461 (0.0612) {0.0166}	-3.0465 (2.4027)	-2.1963 (1.4019)	-2.0157 (2.5679)	-5.4624 (1.9597)
Number of uncles with ≥12 years of Schooling	0.0466 (0.0494) {0.0152}	0.0008 (0.0465) {0.0003}	3.1713 (1.2863)	0.1610 (1.4049)	1.0433 (1.7996)	-0.0881 (1.8180)
Constant	-1.767 -(0.4879)	-1.2340 (0.4476)	49.2637 (14.5291)	43.8953 (11.8883)	33.8875 (17.7335)	27.5936 (20.6919)
N	1042	1151	1014	1124	1014	1124
χ^2	69.26	97.69				
R^2			0.3278	0.2790	0.2057	0.1582

Other variables included in these analyses were dummy variables for don't know father's years of schooling, don't know mother's AFQT score, don't know HOME score, whether no aunts, and whether no uncles. Estimates are weighted by 2002 NLSY child sampling weights. The terms in the brackets { } reports the effect of a one-unit change in the explanatory variable on the probability of college attendance.