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ABSTRACT

A study examined the extent to which socioeconomic and internal characteristics of families differentially affect ability of matched pairs of brothers and sisters to progress through the educational system. The data sets used were the National Longitudinal Surveys of Work Experience of Young Men and Women who were originally interviewed in 1966 and 1968. The analyses were limited to 522 pairs of white youth. It was found that young men were apparently advantaged in their educational progress compared with young women. Sibling position or sex of other siblings had little, if any, influence. The extent of parental education did have a major effect, and the educational progress probabilities for sons were higher than those for daughters, regardless of the parents' education. Greater ability for boys and girls was associated with higher probabilities of education completion. Parental encouragement did affect the ability of youth to succeed. In general, youth's aspirations about educational attainment exceeded their actual attainment. No significant differences in attainment at any educational level could be attributed to background factors. (Fourteen pages of multivariate analyses are provided. Appendixes describe the sample procedure and variable measurement.) (YLB)

Variations in the Educational and Career Development Paths of Brothers and Sisters

by

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Differential socialization of boys and girls has been widely documented in the psychological and sociological literature (Maccoby and Jacklin, 1974; Walum, 1977; Duncan and Duncan, 1978). The ways in which socialization varies by sex have been examined in the context of the family, the peer group and the educational system, and implications have been drawn about the impact of these differences on subsequent educational and occupational success. For young women, in particular, socialization influences can be reflected in psychological and institutional constraints on their ability to fully use their intellectual potential in educational and occupational development. For adult women, perceived sex differences can also translate into discrimination in the labor market. In addition, differential childhood and adolescent socialization of boys and girls can in some instances create social problems for adult women and men in the development and maintenance of social relationships, some of which are manifested in the current high rate of divorce (Mott and Moore, 1978).

This study uses a unique data set to examine one particular facet of this differential socialization process, the extent to which socioeconomic characteristics of families and internal characteristics of families, such as sibling structure, differentially affect the ability of matched pairs of brothers and sisters to progress through the educational system. Implicit in the analysis is the assumption that factors such as parental education and the extent to which youth feel that they have been encouraged in their educational progression by parents are useful operational explanatory measures which are inherent to the socialization process. We will also examine the extent to

which family background factors differentially affect the educational aspirations of siblings of the opposite sex.

THE DATA SET

The data sets used are the National Longitudinal Surveys of Work Experience of Young Men and Women (NLS) who were originally interviewed in 1966 and 1968, respectively. These nationally representative samples of about 5,000 young men (beginning in 1966) and 5,000 young women (beginning in 1968) who were age 14-24 in the initial survey year have been repeatedly interviewed over the following decade about their family, education, employment and related experiences and attitudes. Both the young men's and young women's cohorts had personal interviews a year apart over the first five survey years, briefer telephone interviews at years seven and nine and a lengthy personal interview at the end of the tenth year (1976 for the boys and 1978 for the girls). By the tenth survey year, the 3,700 young men and 4,200 young women still being interviewed were age 24-34 and most had completed their formal education. Thus, we are able to examine the educational progress of nationally representative cohorts of young men and women without introducing any serious truncation biases.

In the initial sample selection process, the U.S. Bureau of the Census interviewed all individuals within a given household who fell within the appropriate age range. Thus, if a household included a young man who was 14 to 24 at the time of the initial interviews with the young men in 1966 and a young woman who was 14 to 24 at the time of the initial interviews with the young women in 1968, they were both included in the samples selected.[1] While

[1]It was also possible to have more than one person of each sex included in the sample. In this study, we restricted our matched pairs to no more than one

these young men and women could be related to each other in many different ways, they were typically brothers and sisters. In order to maximize the likelihood that the sibling pairs were raised in a common environment, where there were more than two siblings to chose from, we selected the pair closest to each other in age. When the choice to be made was ambiguous, we chose pairs who were of high school age when first interviewed so as to maximize the amount of background data we had for them as well as to increase the likelihood that they grew up in a common environment.

Because the young man had to be in his parental household in 1966 and the young woman in her parental household in 1968, many of our matched pairs were of high school age when they were initially interviewed; about 50 percent of the girls and two-thirds of the boys were below age 18 at first interview.[2] We additionally constrained the sample to brother and sister pairs where both siblings were still being interviewed at the ten year interview point. After imposing these various constraints, we were left with a total of 749 matched pairs of brothers and sisters where 522 of the pairs were white, 214 were black and 13 were of other races. Because of the relatively small number of black and other race pairs, the analyses in this paper will be limited to white youth.

The principal rationale for using matched brother-sister pairs is, of course, to more properly control for commonality of background. The matched pairs make possible empirical generalizations about the differential effect of

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sibling pair from a given household.

[2]Because the young men were first interviewed, on the average, about 18 months before the young women, the matched pairs are much more likely to include pairs where the brother is older than the sister. For this reason, we tried to compensate for the age bias by consciously selecting pairs where the girl was older than the boy. This is the reason that the young women's sample in 1968 had a mean age of 17.8 compared with 16.9 for the young men in 1966.

various background factors on educational outcomes for young men and women. Thus, it is important that our matched pairs are generally comparable in demographic and socioeconomic characteristics to a general population group of similar age. To gain this assurance, we compared the matched pair sample with the full nationally representative NLS samples of young men and women of comparable age with respect to their urban-rural residence pattern, family income level, educational attainment of father and whether or not they were living with both parents at age 14. In virtually all situations, our matched pair sample and the overall nationally representative samples matched up well. The only characteristic where the matched pairs and the overall sample differed significantly was on the urban-rural dimension, where the matched pairs were somewhat more likely to be of rural origin. This discrepancy reflects the fact that the sibling pairs, by definition, come from larger households (i.e., there must be at least two youth in the family) and larger households are somewhat more likely to be of rural origin. It is important to emphasize that even though this urban-rural discrepancy existed, it was not manifested in any significant socioeconomic differential between the samples. Further details regarding the sample selection procedure and the nature of the sample may be found in Appendix A.

THE GENERAL RESEARCH PLAN

As we have already noted, the general orientation of the research is to examine the educational patterns of brothers and sisters to see if they vary according to major background factors generally considered in the social science literature to be important determinants of educational progress. We assume that our matched pairs are representative of the American late adolescent population, at least of youth approaching adulthood in the late

1960s and early 1970s. Our data set, therefore, offers distinct advantages over some used in previous status attainment research by allowing greater generalizability and more contemporary information.

Another major advantage of this research is that we can control for common background factors better than has been possible in the past. First, it can be more safely assumed that background factors not measured by the variables in our model will be more likely to be the same between sibling pairs as opposed to unrelated individuals (Sewell and Hauser, 1977). Second, background factors included in our models are much more likely to represent the same factors to brothers and sisters. That is, any interpretation attached to, for example, 12 years of schooling for a father within a family (be it in terms of family status or quality of the father's education) can unambiguously be assumed to mean the same thing from the perspective of the children in the family.[3] In contrast, a comparison of two youth from different families where both fathers had twelve years of schooling requires one to assume that the operational meaning of 12 years of schooling is the same across families, a more tenuous assumption.

While the status attainment literature has to some extent examined sex differences in educational progress, data constraints have been a limiting factor in much of the research. Most has focused on only one sex, usually males. Few of the samples have been nationally representative, and to our knowledge, none has involved a nationally representative cross-sex sample of

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[3]Some researchers would argue that certain family level factors, such as parental education, may vary over time with regard to different siblings. For instance, father's education may have different meaning for the youngest child as opposed to the oldest due to the additional time elapsed since the parent completed his education (Olsen and Wolpin, 1980). Since our sibling pairs were selected with a bias towards keeping them as close as possible in age, we reduce the magnitude of this problem.

pairs from the same household.

The unique sibling match permits us to examine differences in educational progress of brothers and sisters as a function of a variety of factors commonly assumed to affect educational development. Our basic assumption, consistent with previous findings, is that the sister in the sibling pair will, on the average, be handicapped in her educational development (as measured by high school completion, college attendance, college completion and ultimate educational attainment) compared with her brother. This handicap is due to a variety of factors, all of which cannot be treated extensively in this paper.[4] We also hypothesize parallel sex differences in educational goals (as measured by anticipation of college attendance or completion and anticipated educational attainment).[5] In the broadest sense, the categories of independent variables included in our multivariate analysis may be subsumed under the subheadings (1) sibling effects, (2) socioeconomic effects, (3) environmental effects, and (4) other background factors.

The available literature is somewhat ambiguous about how important sibling influences are as predictors of actual educational progress or educational goals. While the effect of family size per se is found in a number of studies to be inversely related to educational achievement and educational expectations,[6] other studies have achieved more qualified results suggesting that family size may, for example, affect one sex to a greater extent than the other (McClendon, 1976; Rosen and Aneshensel, 1978), perhaps

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[4]Adams and Meidam, 1968; Sewell and Shah, 1968; Alexander and Eckland, 1974; Hout and Morgan, 1975; Marini, 1978; Marini and Greenberger, 1978.

[5]We would like to point out that we use a measure of educational aspirations rather than expectations in our research, although some of the literature we will refer to is concerned with educational expectations.

[6]Hout and Morgan, 1975; Blau and Duncan, 1967; Olneck and Bills, 1979.

reflecting a differential distribution of family resources by sex of child, particularly when available resources are severely constrained.

In addition to the number of siblings, sibling placement is also considered in some studies to be a useful predictor of actual and prospective educational success. Whereas some studies find no sibling placement effects, particularly when famiy size is controlled (Adams and Meidam, 1968; Olneck and Bills, 1979), others find that birth order does indeed make a difference. The most general finding is that being a first born is associated with higher educational attainment (Adams, 1972). Blau and Duncan (1967) did, however, find that middle children are at an educational disadvantage regardless of family size. In addition, they consistently found that first borns experienced greater educational advantages in small families whereas last born children fared best in larger families.

Some researchers have been quick to point out that birth order alone is not always an important factor in the socialization process or in educational outcomes, but that the sex of ones' siblings also matters. Sutton-Smith and Rosenberg (1970) give an extensive discussion of the effects of different sibling relationships upon personality development and role modeling throughout childhood and into the adolescent and adult years. Lin and Oliver (1979) note that girls have higher educational aspirations when they have older sisters while Adams and Meidam (1968) show that the presence of male siblings can be a handicap in a girl's educational progress, particularly for girls from blue collar families. In general, the available literature focusing on cross-sex sibling effects is sparse, arguing even more for examination of these types of effects.

In this study, we will try to measure the independent effects of family size, sibling placement and sex of siblings. Our multivariate analyses will

include the number of siblings outside the brother-sister pair (a measure of family size), whether the boy in the pair is older than the girl (a measure of sibling placement) and a variable that captures the sex-mix of siblings who are older than the pair. Youth are assumed to be most affected by the sex (per se) of older rather than younger siblings in terms of potential role models.

The literature focusing on socioeconomic and other background effects is somewhat more substantial than that on sibling influences but, again, it is not conclusive. One general finding has been that both socioeconomic background and ability exert positive and independent effects on educational attainment and educational goals. In terms of sex differences, status background tends to have greater impact on the educational progress of females while ability shows substantial influence upon males (Sewell and Shah, 1967; Alexander and Eckland, 1974).

While most studies have used a composite measure of socioeconomic status, usually incorporating both mother's and father's education, father's occupation and/or family income, few have examined their separate effects. One such study (Sewell and Hauser, 1972) found each component to have approximately equal effect upon educational attainment. On the other hand, Treiman and Terrell (1975) found parental education to be the strongest predictor of educational attainment and a slight tendency toward a like-sexed parent effect. Another study (McClendon, 1976) found mother's education to be a stronger predictor than father's education regardless of the sex of the child. This study contributes to the dialogue by including in its models an interactive variable which separately identifies the father's and mother's educational attainment.[7]

Independent of a status measure based upon parental education, we also include measures of the ability of the brother and sister, an IQ score obtained, for the most part, during the junior or senior year in high school.[8] The effect of IQ (or "ability") on educational progress has been found to be unambiguously positive, although differences between the sexes have been noted. These sex differences generally suggest a stronger ability--attainment or ability--expectations connection for boys than girls.[9] In addition, differential effects of ability on attainment in comparison with expectations have been noted (Alexander and Eckland, 1975).

Our study will examine the symmetry or lack of symmetry in progress of boys and girls with similar IQs in the educational system, after controlling for all other relevant factors. We will also briefly examine some of Griliches' (1979) notions about a possible tendency of parents to equalize outcomes for children with different ability levels. If this process is operative, we anticipate that children with low ability who have siblings of greater ability should experience greater educational "success" than children from households where all siblings have low ability. Furthermore we posit that, in families where one child is brighter than the other, there may be

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[7]See Appendix B for a more detailed discussion of this variable. Family income was not included in our analysis as a status background measure for several reasons. First, it was difficult to obtain a measure of family income that referenced a point in time during the respondents' childhood or even a point prior to college attendance for some. Secondly, the income variable has a substantial number of missing data cases which could pose additional problems of bias.

[8]See Appendix B for further discussion of this variable. Without belaboring the "nature-nuture" argument, we assume that this IQ score, at least to some extent, measures inherent intelligence independent of acquired ability. In any event, it is in all likelihood measuring effects similar to those measured by other researchers who have included IQ measures in their studies.

[9]Sewell and Shah, 1967; Alexander and Eckland, 1974; Marini and Greenberger, 1978.

sibling peer pressures for the youth with less ability to accomplish more than in otherwise similar households where there are no higher IQ youth. With respect to this study, our particular interest is whether or not effects of this type are symmetrical by sex of child. That is, does a higher ability boy enhance his sister's educational accomplishments to the same extent that a higher ability girl helps her brother?

Independent of the above factors, there is some evidence that parental encouragement of youth to further their education can contribute to higher educational attainment and/or goals (Rehberg and Westby, 1967). Most studies do not include information of this type. Hout and Morgan (1975) found that parental encouragement had more influence on boys' educational expectations than girls. Sewell and Shah (1968) found that parental encouragement affected both boys' and girls' college plans, but primarily in higher status families. We will thus test for differences in the influence of parental encouragement on brothers and sisters, and whether or not the influence of a same or opposite sex parent has more or less impact.[10]

All other factors in our multivariate analyses are essentially controls, although many can be of interest in their own light.[11] To the extent that

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[10]Our encouragement factor is admittedly post-hoc. For many of the youth, the encouragement questions were not asked until a number of years after the surveys began. It is extremely likely that in many instances the youth's response regarding parental encouragement could have represented a rationalization for actual behavior patterns. We are not concerned with this complex causality issue here as our intent is not to measure the independent effects of parental encouragement but rather the extent to which brothers and sisters are differentially affected by this encouragement. In this regard, our results would be biased only if there were reason to believe that boys were more or less likely than girls to rationalize. Consult Appendix B for further discussion on this variable.

[11]We hypothesize that, independent of the family's socioeconomic status, whether or not the sibling pair were raised with both parents in the home may have a differential effect on their educational progression. Aside from income constraints associated with having only one parent present, it is

these factors interact with the other key independent variables, they make possible more appropriate measurement of the independent sibling and status effects.

One unique aspect of this research is our ability to examine, at the disaggregated level, the extent to which differences in educational attainment or aspirations between brothers and sisters is sensitive to various family considerations where these family considerations are more appropriately controlled. But although models of these differences will indicate the relative levels of the brothers compared with the sisters, they are not useful for indicating the absolute levels of accomplishment or goals. To properly set the stage for interpreting the differences, we will preface the analysis with separate educational attainment models for the brothers and sisters. In these models, we note the extent to which background factors affect the absolute levels of educational attainment and aspirations of young men and women.

To show the pattern of educational progress and the relationship of this progress to selected background factors, the textual presentation includes summary tables focusing only on the relationships of interest. The educational progress variables are measured as of 1976 for the men and 1978 for the women, at which time the sample is between the ages of 24 and 34. Educational goals are measured at age 18 or at the earliest point available.

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likely that one-parent households present different role models to youth, particularly since most one-parent families include only a mother and frequently the mother is, of necessity, in the labor force. We also hypothesize that youth who grew up in the South or in rural areas will probably have been socialized in a more traditional milieu, particularly with respect to the role of women in society. Finally, our analyses will include a dummy variable indicating whether or not the young man served in the military. To the extent possible, we would like to remove this effect from our models as it is a factor which impedes the relative progression of the brother in comparison to his sister.

Appendix B gives a detailed description of variable measurement; full multivariate analyses may be found in Appendix Tables A.1 through A.7.

SEX DIFFERENCES IN EDUCATIONAL PROGRESS

For our overall sample, it may be noted in Table 1 that the brothers and sisters have approximately equal likelihoods of completing high school. However, the average brother is substantially more likely to have attended college and somewhat more likely to have completed college by the tenth survey year. As of that point, about 34 percent of the young men but only 29 percent of the young women have attained a college degree. However, virtually all of this discrepancy in college completion between the sexes reflects the greater probability of young men to attend college. If we limit the sample to brothers and sisters who have attended college, the girl gains an edge over the boy in the probability of completing college.

In the aggregate, the brothers also have significantly higher educational goals than their sisters, although among both boys and girls substantial proportions have unrealistic aspirations, as may be seen by comparing the educational attainment and educational goal statistics. Whereas 34 percent of the young men have attained a college diploma or better, fully 60 percent had indicated at an earlier date that they wished to complete college--a ratio of .56. The comparable ratio for the sisters was .65. Thus, while a smaller percentage of the young women completed college, their aspirations were substantially below that of their brothers, with only 45 percent aspiring to complete college.

The sex differentials noted do not necessarily relate to differences in the effects of background characteristics included in this study. However, we anticipate that at least some of the differences between boys and girls in

Table 1 Educational Attainment and Educational Goals of Brothers and Sisters

Educational attainment and goals	Brothers	Sisters
Total sample		
Probability of high school completion	.90	.88
Probability of college attendance	.67	.51
Probability of college completion	.34	.29
Mean educational attainment (years)	13.9	13.3
Sample size	498	498
High school completion sample		
Probability of college attendance	.74	.57
Probability of college completion	.37	.33
Sample size	444	440
College attendance sample		
Probability of college completion	.50	.57
Sample size	333	253
Total sample		
Proportion with college attendance goal	.70	.58
Proportion with college completion goal	.60	.45
Mean educational goal (years)	14.8	14.1
Sample size	469	485
Ratio of $\frac{\text{college completion probability}}{\text{proportion with college completion goal}}$	.56	.65

Source: Appendix tables A.1 through A.4.

educational completion and aspirations will reflect the extent to which our measured explanatory variables differentially affect the educational progress of boys and girls.

THE EDUCATIONAL ATTAINMENT PROCESS FOR BOYS AND GIRLS

In order to examine the extent to which the various explanatory variables mentioned above independently affect the ability of brothers and sisters to complete high school, attend college and complete college, we use Multiple Classification Analysis (MCA). In this multivariate procedure, a value is estimated for the dependent variable for each category of each independent variable assuming that the individual is average on all other characteristics. The full attainment models may be found in Appendix Tables A.1 and A.2; the coefficients may be interpreted as the probabilities of attaining the various educational levels.

Sibling Effects

Neither family size or sibling placement appears to have any significant effect upon the ability of brothers to progress educationally. Neither his number of siblings nor his relative age position compared with his sister(s) or brother(s) seems to affect any of the educational attainment probabilities.

On the other hand, while the relationship is not completely linear, there is evidence that sisters who have no more than one sibling (outside of the sibling pair itself) have an educational advantage over their female counterparts who come from larger families. Thus, girls from smaller families have higher probabilities of attending and completing college as well as higher levels of educational attainment than girls from larger families, but boys are neither helped nor hindered by this family size dimension. As with

the boys, we find virtually no evidence of sibling placement affecting the educational progress of young women. With only one exception, our data do not indicate that being the older or younger sibling of the pair, or having older brothers or sisters (outside of the pair) has any effect on a young woman's educational success compared with other young women in other sibling placement arrangements.

Parental Education Effects

In contrast with the lack of sibling effects, the extent of parental education does indeed have a major independent effect on young men's and young women's educational progression. That better educated parents have better educated children is hardly surprising or interesting. What is relevant is how parental education differentially affects the success of sons and daughters. Table 2 highlights this sex-differentiation process. We distinguish between four categories of parental education, examining the consequences of four combinations derived from having a father (mother) with less than 12 years of school or 12 years of school or more. Due to the limited number of parents of that generation who attended college, we were not able to break out separately the group of youth whose parents had attended college. The net effect of parental education may be noted in Table 2.

Almost without exception, the educational progress probabilities for sons are higher than those for daughters, regardless of the parents' education. This finding largely reflects the fact that the overall educational completion probabilities for males are higher than those for females, and the deviations within each sex due to variations in parental education are not sufficient to overcome the overall absolute gap. At the high school completion level, differences are generally small: indeed, high school completion probabilities

Table 2 Parental Education and Child Educational Progression[a]

Parental education	Probability of				
	High school completion	College attendance	College completion	High school graduate completing college	College attendee completing college
Son					
Grand mean	.90	.67	.34	.37	.50
Both parents high school dropouts	.81(-.09)	.49(-.18)	.26(-.08)	.32(-.05)	.53(+.03)
Both parents high school graduates	.94(+.04)	.82(+.15)	.41(+.07)	.44(+.07)	.50(+.00)
Father high school graduate-mother high school dropout	.94(+.04)	.54(-.13)	.22(-.12)	.23(-.14)	.41(-.09)
Mother high school graduate-father high school dropout	.92(+.02)	.64(-.03)	.33(-.01)	.36(-.01)	.52(+.02)
Daughter					
Grand mean	.88	.51	.29	.33	.57
Both parents high school dropouts	.80(-.08)	.36(-.15)	.21(-.08)	.26(-.07)	.58(+.01)
Both parents high school graduates	.94(+.06)	.67(+.16)	.39(+.10)	.41(+.08)	.58(+.01)
Father high school graduate-mother high school dropout	.86(-.02)	.37(-.14)	.11(-.18)	.13(-.20)	.30(-.27)
Mother high school graduate-father high school dropout	.87(-.01)	.41(-.10)	.25(-.04)	.29(-.04)	.61(+.04)

Source: Appendix tables A.1 and A.2.

[a]Numbers in parentheses are deviations from the grand mean.

for boys and girls are virtually identical where both parents are high school dropouts or both are high school graduates. Where there are differences in parental education, probabilities modestly favor the son. Overall, only 51 percent of the daughters compared with 67 percent of the sons attended college. The parental education factor does not mitigate this disadvantage for young women as daughters fare no better or worse relative to sons across families with different levels of parental education except in situations where the mother is a high school graduate and the father a dropout. In families of this type, daughters show a relative disadvantage.

By the college completion level, young women have overcome a substantial proportion of their overall educational disadvantage. In nearly all instances, the boy-girl gap in college completion is much narrower than the gap in college attendance. Indeed, the brother-sister difference in college completion in those families where both parents have at least completed high school is quite small. It is likely that the greater equalitarian ethic found in higher status families has some bearing on the sex equality in college completion for this group. This finding is of some consequence since the subset of families where both parents have at least a high school diploma represents the dominant education group in American society. Among the generation of young adults now marrying, in most instances, both partners have high school diplomas.[12] Thus, the equality evidenced for daughters in such families bodes well for the future.

The particular importance for young women of at least gaining a college foothold may be seen in the last column of Table 2. Here college completion

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[12]In 75 percent of all married couples 25 to 44 years of age in March 1979, both partners had at least a high school diploma. See Table 4 in U.S. Bureau of the Census (1980).

probabilities are presented for young men and women who have attended college. Sisters in the sample who have attended college have higher college completion probabilities than their brothers in all instances except where their father has more education than their mother.

It seems useful to note at this point that, in families where parental education levels differ, the relative effects of parental education levels are most profound. It was mentioned previously that daughters, relative to sons, were particularly disadvantaged in their chances of attending college when the mother had 12 or more years of schooling and the father was a high school dropout, but that young women in this family situation who make it into college are not less likely than their brothers to complete college. In contrast, young women from families where the father has 12 or more years of schooling and the mother is a high school dropout are not particularly disadvantaged relative to their brothers in the probability of attending college, but they do fare far worse in the probability of completing college.

These contrasting results can perhaps be interpreted from the following sociological perspective. In families where the mother has more education than the father, on average, the mother is likely to have less traditional values than the father, but she is still relatively powerless. While she has more education than her husband, the association between education and earnings (and therefore power) for women of that generation was relatively low. Thus, while the better educated mother may have had high educational values with regard to her daughter's education, she was less able to subsidize the daughter to attend college, particularly in the face of opposition from a father who, on average, had more traditional values. However, in those situations where a daughter is able to gain college entry, it is likely that both parents have less traditional values. The less traditional orientation

of the mother may in these situations enhance the young women's likelihood of completing college.

In contrast, families where the father has more education than the mother would, on average, have different parental traits. The father is likely to be less traditional than the mother and have significantly higher earnings and power within the family. Young women from this type of background would probably be as financially able as their brothers to enter college since the parent in the position of power is likely to be the parent with positive educational values. However, for these same young women, the more traditional value orientation of their mother may translate into a lower probability of completing college.

The data noted in Table 2 also show one other interesting finding. When the mother's education exceeds that of the father, both the son and daughter complete substantially more education than in families where the father has more education than the mother. This variation suggests that the transmission of educational values across generations is more likely to be a mother to child phenomenon.

Ability Effects

As with the parental education variable, it is not surprising to find that greater ability for boys and girls is associated with higher probabilities of educational completion at both the high school and college level. Focusing first on high school completion, it may be seen in Table 3 that in families where both the brother and sister have measured IQs below 100, only about two-thirds of the boys and girls complete high school. Conversely, where both have IQs of 100 or greater, 98 percent of the brothers and 93 percent of the sisters graduate. The two asymmetric ability pairs are

Table 3 The Effect of IQ on the Educational Completion of Brothers and Sisters[a]

IQ	Sample size	Probability of completing high school		Probability of completing college	
		Brother	Sister	Brother	Sister
Grand mean	498	.90	.88	.34	.29
Both have IQ equal to or above 100	249	.98(+.08)	.93(+.05)	.47(+.13)	.39(+.10)
Both have IQ below 100	92	.67(-.23)	.67(-.21)	.10(-.24)	.12(-.17)
Brother equal to or above, sister below 100	67	.98(+.08)	.95(+.07)	.38(+.04)	.15(-.14)
Brother below, sister equal to or above 100	90	.86(-.04)	.92(+.04)	.19(-.15)	.28(-.01)

Source: Appendix tables A.1 and A.2.

[a]Numbers in parentheses are deviations from the grand mean.

of particular interest: in families where the boy has a higher IQ than the girl, high school completion probabilities are very high for both sexes, but where the girl is more intelligent, the boy has a probability somewhat below that of the girl. The striking fact is that, in both of these asymmetric situations, the youth with less ability in a family where a sibling has above average ability is much more likely to complete high school than the otherwise comparable youth who has a low ability sibling.[13] Possible reasons for this phenomenon were suggested earlier. The above average sibling possibly creates peer pressure, acts as a role model, and provides intellectual support for the less endowed sibling. In addition, parents in these families may strive harder to equalize educational outcomes for their children.

At the college completion level, similar striking patterns were noted. Where both siblings had IQs equal to or above 100, brothers and sisters had the highest college completion probabilities. Where both had IQs below 100, college completion probabilities were equally low--around 10 percent--for both sexes. The two asymmetric categories were not mirror images of each other however. Higher IQ boys who had lower IQ sisters did substantially better than higher IQ girls who had brothers with lower ability, although the 10 point difference between .38 and .28 equally reflects the overall differences in the grand means and deviations of each sex from their grand mean. In addition, for the boys there was more of a spinoff effect from having a brighter sister than was true for the converse situation; a low ability boy who had a high ability sister was about twice as likely to complete college as

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[13]One could argue that boys and girls do better when their siblings are brighter simply because, even if their own IQ is low, they still, on average, have higher ability than individuals with low IQs whose siblings also have low ability. To test this idea we generated mean IQ scores separately for brothers and sisters for each category of the combined IQ variable. We found only slight evidence in support of this suggestion.

a low IQ boy who had a low IQ sister (19 percent compared with 10 percent). On the other hand, a low IQ girl gained little (15 percent compared with 12 percent) from having a brighter brother. In any event, the substantial sibling spinoff effects noted at the high school completion level suggest the considerable importance of social environments for compensating for limited ability.

Parental Encouragement Effects

Table 4 shows that in those families where the son felt he was encouraged by a father or mother to attend or complete higher education and a daughter felt she was encouraged less, college completion probabilities strongly favor the son. Conversely, where the daughter felt encouraged but the son felt encouraged less, daughters and sons have equal chances of completing college (analogous to the situation where both parents had 12 or more years of education). In general, the most favorable situation for both sexes was where encouragement was felt equally or not at all by either sibling. The vast majority (83 percent for the father and 90 percent for the mother) of these cases are where both siblings felt encouraged and in all likelihood represent the family units which were inculcating more general values about the importance of education for everyone.

Comparing the educational outcomes for sons and daughters indicates that mother's encouragement in comparison with father's encouragement does not provide children of either sex with any particular advantage. Regardless of the sex of the parent, however, sons seem to gain more from parental encouragement than daughters.

Table 4 The Effect of Parental Encouragement on College Completion Probabilities of Sons and Daughters[a]

Parental encouragement	Sample size	Probability of college completion	
		Son	Daughter
Grand mean	498	.34	.29
Father encouragement			
Son perceives more than daughter	117	.33(-.01)	.20(-.09)
Daughter perceives more than son	64	.30(-.04)	.31(+.02)
Equal encouragement (or lack of encouragement)	197	.39(+.05)	.32(+.03)
Mother encouragement			
Son perceives more than daughter	109	.36(+.02)	.21(-.08)
Daughter perceives more than son	81	.26(-.08)	.26(-.03)
Equal encouragement (or lack of encouragement)	217	.36(+.02)	.35(+.06)

Source: Appendix tables A.1 and A.2.

[a]Numbers in parentheses are deviations from the grand mean.

Congruence Between Aspirations and Behavior

In general, youths' aspirations about their educational attainment, on the average, exceed their actual attainment by a considerable margin. Table 5 highlights the general relationship between college completion goals and attainment and how they are differentially related to selected characteristics of brothers and sisters. The full goal models may be found in Appendix Tables A.3 and A.4.

Reflecting the fact that boys' educational goals are generally substantially above those of their sisters but their attainment is only modestly higher, boys have a much poorer congruence between aspirations and reality than do the young women. The young men have the most realistic aspirations regarding the likelihood of completing college when their mother has dropped out of high school, regardless of their father's level of education, primarily because college aspirations are very low for this group of brothers. In a mirror image situation, girls are most realistic when their father has dropped out of high school regardless of their mother's level of education.

The greatest lack of reality is, somewhat paradoxically, in those families where one would presume to find the most rational behavior patterns--families where both parents have at least completed high school. While both brothers and sisters in these families are most likely to actually complete college, they have acquired extremely optimistic aspirations. This is particularly true for the boys in the family, as 41 percent actually have completed college but fully 75 percent had aspired to do so.

For both the boys and girls, a somewhat analogous situation appears with respect to the relevance of ability as a predictor of actual college completion and college goals. High IQ boys are the most likely to actually

Table 5 Comparison of College Completion Goal and Actual College Completion Probabilities for Brothers and Sisters by Selected Characteristics

Selected characteristics	Brother			Sister		
	Actual	Goal	Difference	Actual	Goal	Difference
Parental education						
Both parents high school dropouts	.26	.45	-.19	.21	.34	-.13
Both parents high school graduates	.41	.75	-.34	.39	.59	-.20
Father high school graduate-mother high school dropout	.22	.43	-.21	.11	.28	-.17
Mother high school graduate-father high school dropout	.33	.56	-.23	.25	.32	-.07
Sibling IQ						
Both have IQ equal to or above 100	.47	.75	-.28	.39	.56	-.17
Both have IQ below 100	.10	.28	-.18	.12	.24	-.12
Brother equal to or above, sister below 100	.38	.74	-.36	.15	.33	-.18
Brother below, sister equal to or above 100	.19	.43	-.24	.28	.42	-.14
Father encouragement						
Son perceives more than daughter	.33	.64	-.31	.20	.35	-.15
Daughter perceives more than son	.30	.52	-.22	.31	.47	-.16
Equal encouragement (or lack of encouragement)	.39	.65	-.26	.32	.44	-.12

Table 5 (Continued)

Selected characteristics	Brother			Sister		
	Actual	Goal	Difference	Actual	Goal	Difference
Mother encouragement						
Son perceives more than daughter	.36	.60	-.24	.21	.36	-.15
Daughter perceives more than son	.26	.58	-.32	.26	.48	-.22
Equal encouragement (or lack of encouragement)	.36	.63	-.27	.35	.55	-.20

Source: Appendix tables A.1 through A.4.

complete college, but they also have by far the highest aspirations. As a result many actually accomplish less than they had originally intended to do (at least as of the tenth survey year). For the sisters, the pattern was generally similar although, once again, less pronounced because of the young womens' generally lower aspirations.

The relationship between parental encouragement and the siblings' college goals closely parallels the pattern of college completion. The encouragement factor produces no particularly pronounced variations in the siblings' degree of realism. Indeed, more often than not, for all the variables and for both sexes, greater attainment and higher goals went hand in hand. Unfortunately educational goals are systematically over-optimistic, although the generally narrower gap for the young women speaks to the greater awareness which they probably have regarding the likelihood of extensive educational progress.

DETERMINANTS OF SEX DIFFERENCES IN EDUCATIONAL PROGRESSION

The preceding section focused on the extent to which background characteristics in the form of parental education or encouragement and differential sibling ability were related to a youth's propensity to "succeed" educationally. Although inter-sex comparisons were made, the primary objective was to see which factors contributed to girls doing better or worse or boys doing better or worse.

This section will directly test the extent to which the same background factors are related to the differential ability of the brother or sister to succeed. These difference models definitely do not permit interpretation of whether or not a boy or girl does well in an absolute sense, as we do not distinguish between brother-sister equality where both do poorly or both do well.

In the models highlighted in this section, the dependent variables are differences between brothers and sisters in (1) whether they completed high school, (2) whether they attended college, and (3) whether they completed college. Because the models have qualitative dependent variables which include more than two categories, we use a multiple choice logit estimation procedure to test for the significance of the various explanatory factors.[14] Appendix Tables A.5 through A.7 include full multiple choice logit models.

For each level of educational completion three models are estimated which, in essence, permit estimation of the independent effect of various explanatory factors on the probabilities of the brother and sister being in each category of the dependent variable. That is, with respect to the likelihood of having completed high school, the possibilities allowed for in the model are (1) sister has completed but brother has not, (2) either both or neither sibling have completed, or (3) brother has completed but sister has not. The three high school completion multiple logit models included in Appendix Table A.5 compare (1) with (3), (1) with (2), and (2) with (3). Parallel models for the differential probability of college attendance and the probability of college completion are also included in Appendix Tables A.6 and A.7, respectively. Given our interest in measuring the determinants of sex differences in attainment, we will focus on the models which compare the possibilities of (1) the sister having more education than the brother with (3) the brother having more education than the sister. This polar comparison should indicate the maximum extent to which the explanatory variables of interest differentially affect the relative success of brothers and sisters. Positive coefficients in the model imply that the brother has an advantage and

[14]See Schmidt and Strauss (1975) for a brief summary and application of this technique.

negative coefficients favor the sister.

Just as the separate attainment models did not suggest any major association between sibling placement or family size and educational completion, no significant differences in attainment at any educational level may be attributed to these variables. Neither the number of siblings nor their sex or relative position in the family seems to affect the relative success of the boy compared with the girl since none of the logit coefficients approaches significance. The only exception to these findings is that boys are helped modestly at the high school completion level compared with their sisters when they are the oldest in the pair.

With respect to the relative importance of the educational attainment of the youth's parents on the siblings' differential educational progression, similar nonsignificant results were obtained. Unequal levels of parental educational attainment (in comparison with the situation where both parents have at least completed high school) while leading to positive coefficients (i.e., boys completing more education than girls) do not significantly favor the male sex.

In the earlier attainment analysis which focused separately on the young men and women, almost all the sons had higher probabilities of high school completion, college attendance and college completion than did daughters. The results here suggest that the different parental education categories are not significant predictors of the <u>difference</u> between the brothers' and sisters' attainment, even though the levels of attainment may vary across parental education categories. That is, if the sons have relatively equal advantages in all the parental education categories, a brother-sister difference variable does not attain significance.

It is also somewhat surprising that the parental education category where

the father had 12 or more years of education and the mother completed less than 12 years does not systematicallly predict a significantly higher probability of college completion for the young men. Sons in this category were much more likely to graduate from college than daughters: this may be one instance where the within-family relationships measured in the difference model suggest different results from the analogous comparisons made earlier from the separate sex models. Indeed, one objective of this research has been to suggest whether or not analogous results are obtained when comparing within-family results with separate sex models which do not directly focus on disaggregated differences in attainment. While the two approaches will be shown to be generally consistent, there is no theoretical reason why they need always be so.

The pattern of association between sibling IQ differences and sibling differences in educational completion generally parallel the earlier separate sex models. Girls who are more intelligent than their brothers have a relative advantage in the likelihood of high school completion over those in homes where both siblings have IQs above 100. Similarly, girls in homes where both siblings have low IQ are generally advantaged compared to a situation where both siblings have IQs above 100.

Girls have a similar advantage in the likelihood of college completion when they have greater measured mental ability than their brothers, and boys have a parallel advantage when they have the mental edge. It may be recalled that in the earlier separate sex analysis, high IQ for a son appeared to provide him more educational advantage than high IQ for a daughter. This is not inconsistent with the results noted here in the difference models, as it should be recalled that the reference category in the logit model is those sibling pairs where both have above average ability. In that category, boys

have significantly higher college completion probabilities than girls.

We have noted that sons had a high college completion probability in comparison with daughters when they were encouraged to continue their education, whereas the daughters did not feel equally encouraged. In contrast, daughters who perceived more encouragement than the son from either parent, were only able to hold their own with regard to the probability of completing college. That is, sons' and daughters' college completion probabilities were the same in those families where the daughter felt more encouraged. This finding is generally supported by the difference models. However, in terms of being able to attend college and, to a lesser extent, completing high school, receiving more encouragement from a mother does seem to provide a young woman with an advantage over her brother.

In general, the separate sex attainment models are more satisfying in the sense that the results are easier to interpret; in addition, they provide measures of absolute excellence or accomplishment. On the other hand, the intrafamily difference models more directly provide useful indicators of how within-family variations are affected by the various explanatory factors. However, while the intrafamily models indicate the relative positions of the brothers and sisters, they tell us little about how much they achieve in an absolute sense. While the difference models could theoretically handle both the difference and absolute level considerations by including appropriate interaction terms, a far larger sample size would have been required to incorporate all the necessary interaction terms.

The substantive interpretations one can draw from a model where differences are essentially being compared with differences within a dummy variable framework depend considerably on which categories are being excluded from the model for reference purposes. For example, the exclusion of the

category where both youths had IQs above 100 led to a different interpretation of the other IQ variables than might have been true if the low IQ category had been omitted. In the situation where both youths have IQs over 100, the brother has a substantially greater likelihood of completing college than the sister. In the converse situation where both siblings have low IQs, they both have equally low college completion probabilities. Shifting the reference group might well have altered the relative significance of the other two IQ categories.

CONCLUSIONS

Regardless of the model, young men are apparently advantaged in their educational progress compared with young women. In most instances, there is a severe imbalance between the extent to which brothers and sisters are helped or hurt within presumably mirror image situations. Situations which on the surface should favor a young man, favor him substantially whereas situations which should favor a young woman, favor her modestly, if at all.

We find little, if any, influence of sibling position or the sex of other siblings on the relative educational progress of youth. On the other hand, parental encouragement can affect the ability of youth to succeed, and the encouragement of a mother is particularly influential: for sons at the college completion level and for daughters at the college attendance and high school completion levels.

The parental education factor suggests that, from a long term perspective, much of the educational discrepancy between sons and daughters reflects an intergenerational phenomenon which may well be short-lived. Most of the sex discrepancy in educational progress reflects the much greater probability for young men to continue their education to the college

attendance level. In most instances, a young woman who is able to enter college is much more likely to graduate. The sole exception is where the father has graduated from high school but the mother has dropped out, a category of decreasing numerical importance in our society. In addition, families where both parents have at least completed high school appear to be relatively equalitarian in terms of sons' and daughters' educational payoffs. Since most young family units now fall into this category, future sex differences in educational attainment are likely to diminish in importance.

Finally, the mechanisms behind the connection between children's IQ or mental ability and their educational progress raise some intriguing questions about how social forces can help youth overcome intrinsic academic or ability disadvantage. It is very clear that a sibling with less measured ability receives an advantage when he or she has a higher ability sibling. Low ability youth with high ability siblings have substantially superior educational progress than youth with low ability who have equally disadvantaged siblings. Because the models have controlled for other socioeconomic factors, this finding is likely related to other forms of intrafamily pressures. It may be, as Griliches (1979) has suggested, that parents strive to equalize outcomes. It may also reflect intrafamily social and psychological support systems whereby higher ability siblings and parents provide academic assistance. Also, educational values, aspirations and accomplishments may be transferred from one youth to another in far more subtle ways. A family environment where one youth has more ability may be more sensitive to academic achievement. In this regard, having at least one youth with higher measured IQ may simply be another way of operationalizing a family with higher educational goals for their children. The data show that

in families with "mixed" IQs, the educational goal of the less intelligent sibling is not substantially different from the family units where both siblings have above average IQs. In fact, where the lower ability child is a son, his educational aspirations are identical to those of high IQ sons in families where both siblings have high IQs.

In this paper we have primarily focused on sex differences in educational progress. However, research underway will analyze how this differential educational process for boys and girls translates into career orientations. Particular attention is being given to future work intentions and the type of occupation desired, including how typical or atypical occupational aspirations are with regard to occupational distributions by sex in the labor force. We are also examining the extent to which differences in career orientations between brothers and sisters directly reflect early background factors and indirectly reflect these factors through mediation in the educational process.

Table A.1 Models of Educational Progress for Brothers in Sibling Sample: Multiple Classification Analysis (Adjusted Percentages)[a]

Independent variables	Number of respondents	Dependent variables: Probability of high school completion	Probability of college attendance	Probability of college completion	Actual educational attainment
Siblings outside of pair					
Number:		(0.370)	(0.434)	(1.033)	(0.080)
0-1	183	0.888	0.688	0.369	13.90
2	101	0.909	0.669	0.299	13.82
3+	214	0.908	0.652	0.328	13.91
Age and sex:		(0.180)	(0.551)	(0.879)	(0.928)
Older girls only	68	0.881	0.619	0.264	13.57
Older boys only	98	0.896	0.659	0.337	13.97
Older of both sexes	83	0.904	0.669	0.355	13.76
All younger or none	249	0.906	0.686	0.352	13.98
Boy oldest in pair		(0.561)	(0.741)	(0.723)	(1.148)
Yes	310	0.907	0.657	0.350	13.96
No	188	0.889	0.688	0.317	13.76
Parents' education		(7.510)***	(22.867)***	(5.564)***	(19.736)***
Both 0-11	138	0.812	0.486	0.257	13.05
Father 0-11/mother 12+	97	0.920	0.640	0.327	13.72
Father 12+/mother 0-11	41	0.944	0.544	0.216	13.16
Both 12+	222	0.939	0.818	0.415	14.60
Encouragement - mother		(5.208)***	(2.309)*	(1.531)	(2.496)*
No difference	217	0.893	0.706	0.364	13.93
Girl perceives more than boy	81	0.877	0.577	0.257	13.43
Boy perceives more than girl	109	0.856	0.651	0.362	13.83
Not ascertainable	91	0.994	0.682	0.317	14.25
Encouragement - father		(15.691)***	(1.949)	(1.868)	(6.028)***
No difference	197	0.918	0.685	0.389	14.17
Girl perceives more than boy	64	0.903	0.668	0.302	13.77
Boy perceives more than girl	117	1.000	0.713	0.325	14.11
Not ascertainable	120	0.771	0.599	0.284	13.25
Pair lived with both parents at age 14		(0.026)	(1.877)	(0.531)	(0.757)
Yes	428	0.901	0.678	0.343	13.92
No	70	0.896	0.610	0.304	13.69
Oldest in pair lived in urban area at age 14		(1.595)	(0.714)	(0.553)	(1.217)
Yes	299	0.889	0.681	0.326	13.97
No	199	0.919	0.651	0.354	13.77

Table A.1 (continued)

Independent variables	Number of respondents	Dependent variables: Probability of high school completion	Probability of college attendance	Probability of college completion	Actual educational attainment
Pair lived in South at time of initial survey[b]		(0.720)	(0.473)	(0.314)	(0.333)
Yes	137	0.884	0.649	0.354	13.80
No	361	0.907	0.676	0.331	13.92
IQ		(34.756)***	(30.488)***	(22.507)***	(52.926)***
Both ≥ 100	249	0.979	0.778	0.468	14.74
Boy ≥ 100/girl < 100	67	0.983	0.824	0.377	14.54
Boy < 100/girl ≥ 100	90	0.856	0.547	0.185	12.95
Both < 100	92	0.668	0.379	0.104	11.97
Boy served in military			(0.043)	(19.920)***	(1.270)
Yes		[c]	0.674	0.225	13.75
No			0.666	0.398	13.96
Grand mean	498	0.901	0.669	0.337	13.89
F		8.765***	11.970***	8.169***	15.475***
Adjusted $\bar{R}^2$		0.499	0.572	0.491	0.627

[a]Numbers in parentheses are F statistics for individual variables. One, two and three asterisks indicate that the F is significant at the .10, .05 and .01 percent levels, respectively. All variables are described in detail in Appendix B.

[b]The initial survey year is 1966 for the young men and 1968 for the young women.

[c]Variable is not included in this model.

Table A.2 Models of Educational Progress for Sisters in Sibling Sample: Multiple Classification Analysis (Adjusted Percentages)[a]

Independent variables	Number of respondents	Dependent variables: Probability of high school completion	Probability of college attendance	Probability of college completion	Actual educational attainment
Siblings outside of pair					
Number:		(1.211)	(2.947)*	(5.601)***	(3.789)**
0-1	183	0.903	0.560	0.363	13.67
2	101	0.898	0.438	0.213	13.17
3+	214	0.860	0.497	0.262	13.15
Age and sex:		(0.923)	(0.689)	(0.008)	(0.634)
Older girls only	68	0.908	0.519	0.295	13.50
Older boys only	98	0.918	0.535	0.286	13.54
Older of both sexes	83	0.864	0.451	0.291	13.27
All younger or none	249	0.870	0.513	0.288	13.26
Boy oldest in pair		(0.001)	(5.515)**	(0.577)	(0.097)
Yes	310	0.883	0.474	0.279	13.33
No	188	0.884	0.564	0.306	13.38
Parents' education		(6.515)***	(20.441)***	(9.233)***	(15.971)***
Both 0-11	138	0.804	0.360	0.213	12.62
Father 0-11/mother 12+	97	0.871	0.411	0.253	13.17
Father 12+/mother 0-11	41	0.864	0.366	0.110	12.62
Both 12+	222	0.942	0.669	0.386	14.01
Encouragement - mother		(4.733)***	(1.832)	(3.228)**	(3.943)***
No difference	217	0.912	0.531	0.345	13.62
Girl perceives more than boy	81	0.951	0.566	0.259	13.50
Boy perceives more than girl	109	0.831	0.477	0.207	12.85
Not ascertainable	91	0.820	0.438	0.280	13.15
Encouragement - father		(3.854)***	(4.920)***	(2.515)*	(2.262)*
No difference	197	0.866	0.572	0.324	13.60
Girl perceives more than boy	64	0.791	0.544	0.307	13.31
Boy perceives more than girl	117	0.920	0.390	0.203	13.00
Not ascertainable	120	0.926	0.499	0.306	13.28
Pair lived with both parents at age 14		(1.975)	(1.209)	(0.436)	(0.007)
Yes	428	0.891	0.500	0.294	13.35
No	70	0.838	0.559	0.260	13.33
Oldest in pair lived in urban area at age 14		(3.608)*	(0.005)	(0.379)	(0.000)
Yes	299	0.863	0.509	0.280	13.35
No	199	0.914	0.507	0.302	13.35

Table A.2 (continued)

Independent variables	Number of respondents	Dependent variables: Probability of high school completion	Probability of college attendance	Probability of college completion	Actual educational attainment
Pair lived in South at time of initial survey[b]		(0.067)	(0.090)	(1.559)	(0.002)
Yes	137	0.889	0.517	0.325	13.35
No	361	0.881	0.505	0.276	13.34
IQ		(20.367)***	(16.539)***	(13.656)***	(30.363)***
Both ≥ 100	249	0.933	0.612	0.390	14.00
Boy ≥ 100/girl < 100	67	0.947	0.357	0.150	12.91
Boy < 100/girl ≥ 100	90	0.917	0.550	0.283	13.53
Both < 100	92	0.670	0.296	0.123	11.71
Boy served in military			(1.396)	(8.148)***	(3.382)*
Yes		[c]	0.478	0.221	13.12
No			0.524	0.326	13.47
Grand mean	498	0.884	0.508	0.289	13.35
F		6.107***	11.296***	8.290***	13.561***
Adjusted R^2		0.421	0.560	0.494	0.598

[a] Numbers in parentheses are F statistics for individual variables. One, two and three asterisks indicate that the F is significant at the .10, .05 and .01 percent levels, respectively. All variables are described in detail in Appendix B.

[b] The initial survey year is 1966 for the young men and 1968 for the young women.

[c] Variable is not included in this model.

Table A.3 Models of Educational Goals for Brothers in Sibling Sample: Multiple Classification Analysis (Adjusted Percentages)[a]

Independent variables	Number of respondents	Dependent variables: Educational goal as of age 18	Probability goal is to attend college	Probability goal is to complete college
Siblings outside of pair				
Number:		(0.342)	(0.158)	(0.171)
0-1	176	14.73	0.695	0.594
2	92	14.72	0.722	0.595
3+	201	14.88	0.703	0.616
Age and sex:		(0.872)	(0.840)	(1.211)
Older girls only	66	14.55	0.674	0.548
Older boys only	90	14.65	0.670	0.572
Older of both sexes	78	14.73	0.684	0.588
All younger or none	235	14.94	0.731	0.636
Boy oldest in pair		(3.065)*	(0.106)	(0.373)
Yes	297	14.92	0.708	0.612
No	172	14.58	0.696	0.589
Parents' education		(17.450)***	(16.089)***	(19.322)***
Both 0-11	131	13.88	0.538	0.449
Father 0-11/mother 12+	91	14.69	0.669	0.555
Father 12+/mother 0-11	34	14.30	0.654	0.428
Both 12+	213	15.48	0.829	0.747
Encouragement - mother		(2.503)*	(1.940)	(0.615)
No difference	212	14.94	0.703	0.627
Girl perceives more than boy	75	14.20	0.616	0.580
Boy perceives more than girl	104	14.85	0.728	0.601
Not ascertainable	78	14.88	0.757	0.565
Encouragement - father		(3.477)**	(4.031)***	(3.206)**
No difference	192	15.01	0.733	0.646
Girl perceives more than boy	60	14.68	0.727	0.517
Boy perceives more than girl	111	14.99	0.749	0.641
Not ascertainable	106	14.25	0.590	0.535
Pair lived with both parents at age 14		(0.025)	(0.027)	(0.585)
Yes	404	14.80	0.702	0.609
No	65	14.76	0.711	0.569
Oldest in pair lived in urban area at age 14		(16.965)***	(8.025)***	(10.905)***
Yes	282	15.11	0.745	0.652
No	187	14.31	0.642	0.531

Table A.3 (continued)

Independent variables	Number of respondents	Dependent variables: Educational goal as of age 18	Probability goal is to attend college	Probability goal is to complete college
Pair lived in South at time of initial survey[b]		(2.639)	(3.671)*	(9.655)***
Yes	131	15.04	0.758	0.693
No	338	14.70	0.682	0.569
IQ		(52.319)***	(27.447)***	(39.713)***
Both ≥ 100	240	15.65	0.813	0.749
Boy ≥ 100/girl < 100	58	15.50	0.846	0.742
Boy < 100/girl ≥ 100	84	14.14	0.587	0.432
Both < 100	87	12.59	0.421	0.276
Grand mean	469	14.79	0.704	0.603
F		16.369***	10.274***	14.095***
Adjusted $\bar{R}^2$		0.639	0.542	0.608

[a] Numbers in parentheses are F statistics for individual variables. One, two and three asterisks indicate that the F is significant at the .10, .05 and .01 percent levels, respectively. All variables are described in detail in Appendix B.

[b] The initial survey year is 1966 for the young men and 1968 for the young women.

Table A.4 Models of Educational Goals for Sisters in Sibling Sample: Multiple Classification Analysis (Adjusted Percentages)[a]

Independent variables	Number of respondents	Dependent variables: Educational goal as of age 18	Probability goal is to attend college	Probability goal is to complete college
Siblings outside of pair				
Number:		(3.094)**	(1.811)	(2.385)*
0-1	181	14.38	0.621	0.498
2	100	13.86	0.525	0.391
3+	204	14.02	0.569	0.430
Age and sex:		(0.741)	(0.429)	(0.691)
Older girls only	67	14.20	0.596	0.469
Older boys only	95	14.29	0.569	0.496
Older of both sexes	79	13.89	0.536	0.427
All younger or none	244	14.11	0.593	0.429
Boy oldest in pair		(2.527)	(3.660)*	(1.681)
Yes	301	14.02	0.551	0.428
No	184	14.29	0.626	0.479
Parents' education		(19.881)***	(20.483)***	(16.450)***
Both 0-11	132	13.51	0.468	0.341
Father 0-11/mother 12+	93	13.62	0.420	0.323
Father 12+/mother 0-11	40	13.47	0.427	0.284
Both 12+	220	14.82	0.741	0.594
Encouragement - mother		(9.306)***	(6.272)***	(10.953)***
No difference	213	14.53	0.668	0.550
Girl perceives more than boy	79	14.27	0.553	0.482
Boy perceives more than girl	106	13.74	0.506	0.359
Not ascertainable	87	13.45	0.474	0.273
Encouragement - father		(2.413)*	(0.857)	(3.551)**
No difference	193	14.17	0.605	0.443
Girl perceives more than boy	61	14.24	0.605	0.473
Boy perceives more than girl	115	13.74	0.531	0.355
Not ascertainable	116	14.35	0.570	0.533
Pair lived with both parents at age 14		(0.231)	(0.023)	(3.071)*
Yes	416	14.14	0.578	0.461
No	69	14.02	0.586	0.365
Oldest in pair lived in urban area at age 14		(0.872)	(1.100)	(0.689)
Yes	291	14.18	0.596	0.460
No	194	14.03	0.555	0.428

Table A.4 (continued)

Independent variables	Number of respondents	Dependent variables: Educational goal as of age 18	Probability goal is to attend college	Probability goal is to complete college
Pair lived in South at time of initial survey[b]		(1.152)	(0.431)	(1.746)
Yes	131	14.27	0.600	0.489
No	354	14.07	0.572	0.432
IQ		(24.220)***	(13.713)***	(15.327)***
Both ≥ 100	247	14.68	0.667	0.563
Boy ≥ 100/girl < 100	64	13.87	0.573	0.326
Boy < 100/girl ≥ 100	87	14.06	0.580	0.418
Both < 100	87	12.77	0.334	0.238
Grand mean	485	14.12	0.579	0.447
F		13.560***	10.294***	10.216***
Adjusted $\bar{R}^2$		0.594	0.536	0.534

[a]Numbers in parentheses are F statistics for individual variables. One, two and three asterisks indicate that the F is significant at the .10, .05 and .01 percent levels, respectively. All variables are described in detail in Appendix B.

[b]The intital survey year is 1966 for the young men and 1968 for the young women.

Table A.5 Difference Between Brothers and Sisters in the Probability of Completing High School: Multiple Choice Logit Estimation[a]

Independent variables	Probability of Completing High School		
	Boy(yes)-girl(no)/ girl(yes)-boy(no)	No difference/ girl(yes)-boy(no)	Boy(yes)-girl(no)/ no difference
Siblings outside of pair			
Number (continuous)	-0.038 (-0.26)	-0.028 (-0.25)	-0.010 (-0.09)
Older girls only	-1.134 (-0.94)	-0.371 (-0.40)	-0.764 (-0.92)
Older boys only	-0.899 (-1.01)	-0.570 (-0.86)	-0.329 (-0.51)
Older of both sexes	0.331 (0.33)	-0.336 (-0.39)	0.667 (1.12)
Boy oldest in pair	1.085 (1.53)*	1.019 (1.79)**	0.065 (0.14)
Parents' education			
Both 0-11	0.552 (0.52)	-0.649 (-0.78)	1.201 (1.73)**
Father 0-11/mother 12+	0.230 (0.22)	-1.523 (-1.89)**	1.752 (.2.62)
Father 12+/mother 0-11	1.227 (0.83)	-0.186 (-0.15)	1.413 (1.68)**
Encouragement-mother			
Girl perceives more than boy	-1.552 (-1.30)*	-0.271 (-0.35)	-1.280 (-1.35)*
Boy perceives more than girl	0.252 (0.25)	-0.270 (-0.31)	0.523 (0.89)
Encouragement-father			
Girl perceives more than boy	1.928 (1.58)	0.511 (0.51)	1.417 (1.83)
Boy perceives more than girl	2.508 (1.92)**	2.329 (1.94)**	0.180 (0.30)
Pair lived with both parents at age 14	-0.027 (-0.03)	0.867 (1.19)	-0.894 (-1.67)
Oldest in pair lived in urban area at age 14	0.122 (0.17)	-0.218 (-0.39)	0.340 (0.72)
Pair lived in South at time of initial survey[b]	-0.910 (-1.20)	-0.317 (-0.55)	-0.592 (-1.13)

Table A.5 (Continued)

Independent variables	Probability of Completing High School		
	Boy(yes)-girl(no)/ girl(yes)-boy(no)	No difference/ girl(yes)-boy(no)	Boy(yes)-girl(no)/ no difference
IQ			
Boy ≥ 100/girl < 100	9.048 (0.05)	8.940 (0.05)	0.108 (0.16)
Boy < 100/girl ≥ 100	-3.378 (-2.60)***	-3.046 (-2.78)***	-0.332 (-0.45)
Both < 100	-2.350 (-1.87)*	-3.423 (-2.97)***	1.073 (1.94)*
Constant	1.420 (0.83)	5.142 (3.49)***	-3.722 (-4.00)***

[a]All variables are described in detail in Appendix B. All independent variables are dichotomous unless specified otherwise. Numbers in parentheses represent asymptotic t-statistics. One, two and three asterisks indicate that the t is significant at the .10, .05 and .01 percent levels, respectively. Sample size is 493 pairs. Mean probabilities for each category of the dependent variable are as follows: (a) boy(yes)-girl(no) = .055; (b) girl(yes)-boy(no) = .039; and (c) no difference = .907.

[b]The initial survey year is 1966 for the young men and 1968 for the young women.

Table A.6 Difference Between Brothers and Sisters in the Probability of Attending College: Multiple Choice Logit Estimation[a]

Independent variables	Probability of Attending College		
	Boy(yes)-girl(no)/ girl(yes)-boy(no)	No difference/ girl(yes)-boy(no)	Boy(yes)-girl(no)/ no difference
Siblings outside of pair			
Number (continuous)	0.038 (0.37)	-0.006 (-0.06)	0.044 (0.76)
Older girls only	-0.371 (-0.52)	0.251 (0.40)	-0.622 (-1.55)*
Older boys only	-0.405 (-0.71)	-0.262 (-0.53)	-0.142 (-0.43)
Older of both sexes	0.262 (0.37)	0.062 (0.10)	0.200 (0.55)
Boy oldest in pair	0.408 (0.90)	0.111 (0.27)	0.297 (1.17)
Parents' education			
Both 0-11	-0.182 (-0.32)	-0.053 (-0.11)	-0.129 (-0.39)
Father 0-11/mother 12+	0.876 (1.36)	0.487 (0.82)	0.389 (1.21)
Father 12+/mother 0-11	0.708 (0.77)	0.577 (0.68)	0.131 (0.29)
Encouragement-mother			
Girl perceives more than boy	-1.759 (-2.55)***	-0.967 (-1.77)**	-0.791 (-1.64)*
Boy perceives more than girl	-0.078 (-0.11)	0.018 (0.03)	-0.096 (-0.26)
Encouragement-father			
Girl perceives more than boy	0.126 (0.16)	0.024 (0.04)	0.102 (0.20)
Boy perceives more than girl	1.246 (1.72)**	0.261 (0.38)	0.985 (2.87)***
Pair lived with both parents at age 14	1.205 (1.98)**	0.547 (1.08)	0.658 (1.67)**
Oldest in pair lived in urban area at age 14	0.563 (1.24)	0.676 (1.67)	-0.113 (-0.44)
Pair lived in South at time of initial survey[b]	0.025 (0.05)	0.550 (1.21)	-0.525 (-1.79)

Table A.6 (Continued)

Independent variables	Probability of Attending College		
	Boy(yes)-girl(no)/ girl(yes)-boy(no)	No difference/ girl(yes)-boy(no)	Boy(yes)-girl(no)/ no difference
IQ			
Boy ≥ 100/girl < 100	11.679 (0.11)	10.609 (0.10)	1.070 (3.28)***
Boy < 100/girl ≥ 100	-1.717 (-3.05)***	-1.080 (-2.36)***	-0.637 (-1.63)*
Both < 100	-1.011 (-1.59)	-0.637 (-1.13)	-0.373 (-1.00)
Boy served in military	-0.122 (-0.28)	-0.849 (-2.17)**	0.727 (2.95)
Constant	-0.197 (-0.22)	2.079 (2.74)***	-2.276 (-4.33)***

[a] All variables are described in detail in Appendix B. All independent variables are dichotomous unless specified otherwise. Numbers in parentheses represent asymptotic t-statistics. One, two and three asterisks indicate that the t is significant at the .10, .05 and .01 percent levels, respectively. Sample size is 493 pairs. Mean probabilities for each category of the dependent variable are as follows: (a) boy(yes)-girl(no) = .233; (b) girl(yes)-boy(no) = .069; and (c) no difference = .698.

[b] The initial survey year is 1966 for the young men and 1968 for the young women.

Table A.7 Difference Between Brothers and Sisters in the Probability of Completing College: Multiple Choice Logit Estimation

Independent variables	Probability of Completing College		
	Boy(yes)-girl(no)/ girl(yes)-boy(no)	No difference/ girl(yes)-boy(no)	Boy(yes)-girl(no)/ no difference
Siblings outside of pair			
Number (continuous)	0.077 (0.72)	0.144 (1.60)*	-0.067 (-0.94)
Older girls only	-0.788 (-1.26)	-0.155 (-0.33)	-0.632 (-1.34)*
Older boys only	-0.024 (-0.05)	-0.129 (-0.31)	0.104 (0.29)
Older of both sexes	0.194 (0.30)	0.071 (0.13)	0.124 (0.30)
Boy oldest in pair	0.373 (0.96)	-0.160 (-0.51)	0.533 (1.86)**
Parents' education			
Both 0-11	-0.012 (-0.02)	0.155 (0.36)	-0.168 (-0.45)
Father 0-11/mother 12+	0.244 (0.49)	0.043 (0.10)	0.200 (0.57)
Father 12+/mother 0-11	0.960 (1.03)	1.199 (1.51)*	-0.239 (-0.43)
Encouragement-mother			
Girl perceives more than boy	-0.032 (-0.05)	0.237 (0.48)	-0.269 (-0.54)
Boy perceives more than girl	0.924 (1.45)*	0.187 (0.33)	0.737 (1.89)**
Encouragement-father			
Girl perceives more than boy	-0.482 (-0.69)	-0.387 (-0.75)	-0.095 (-0.17)
Boy perceives more than girl	0.856 (1.36)*	0.635 (1.13)	0.221 (0.58)
Pair lived with both parents at age 14	0.076 (0.13)	-0.167 (-0.37)	0.242 (0.60)
Oldest in pair lived in urban area at age 14	-0.136 (-0.34)	-0.121 (-0.37)	-0.015 (-0.05)
Pair lived in South at time of initial survey[b]	-0.278 (-0.66)	-0.291 (-0.86)	0.013 (0.04)

Table A.7 (Continued)

Independent variables	Probability of Completing College		
	Boy(yes)-girl(no)/ girl(yes)-boy(no)	No difference/ girl(yes)-boy(no)	Boy(yes)-girl(no)/ no difference
IQ			
Boy ≥ 100/girl < 100	1.515 (1.88)**	1.216 (1.59)*	0.299 (0.83)
Boy < 100/girl ≥ 100	-1.255 (-2.50)***	-0.626 (-1.78)**	-0.629 (-1.49)*
Both < 100	-0.538 (-0.63)	1.427 (2.16)**	-1.965 (-3.39)***
Boy served in military	-0.627 (-1.51)*	0.105 (0.32)	-0.732 (-2.41)***
Constant	0.014 (0.02)	1.524 (2.46)**	-1.510 (-2.74)***

[a]All variables are described in detail in Appendix B. All independent variables are dichotomous unless specified otherwise. Numbers in parentheses represent asymptotic t-statistics. One, two and three asterisks indicate that the t is significant at the .10, .05 and .01 percent levels, respectively. Sample size is 493 pairs. Mean probabilities for each category of the dependent variable are as follows: (a) boy(yes)-girl(no) = .166; (b) girl(yes)-boy(no) = .118; and (c) no difference = .716.

[b]The initial survey year is 1966 for the young men and 1968 for the young women.

APPENDIX A

SAMPLING PROCEDURE

In 1966, the original sample of NLS young men aged 14 to 24 was interviewed by the U.S. Bureau of the Census. When the NLS young women's cohort (age 14 to 24) was selected in 1968, the sample was drawn from the same households as the young men in 1966, thus it is possible to match brothers and sisters from the two different cohorts. This matching produces 1,913 brother-sister pairs for which data is merged onto a single data tape. We cannot distinguish with complete accuracy whether the boy and girl are step-brother/step-sister, adopted, or biological brother and sister, but we do know that at some point in time, they had to have been living together in the same household (usually 1966) and by checking household record information, each respondent must have listed the other as his or her brother/sister.

Of these 1,913 pairs, 467 (containing a total of 1,177 pairs) come from multiple pair families and 736 come from single pair households. Since we limited our sample to one pair per household and imposed the additional restriction that the boy be interviewed in 1976 and the girl in 1978, we retained a total of 749 pairs (522 white, 214 black, and 13 other race pairs).

There were several criteria involved in selecting a single pair from each multiple pair household. First, to offset the bias of the boy usually being older than the girl due to the original cohort selection process (boys were age 14 to 24 in 1966 and girls were age 14 to 24 in 1968) we generally chose the youngest boy in the household and matched him to the girl closest in age. If there were two girls, one older and one younger, but equidistant in age from the boy, we chose the older girl. If there was a significantly large gap (for example, 5 years) between the youngest boy's age and the girl nearest him in age, a different brother-sister pair was chosen who were closer in

age. When the choice between pairs was difficult, we tended to favor pairs of high school age when first interviewed so as to maximize the amount of data available for analysis.

Table 1 presents a comparison between the sibling sample and the overall cohorts for selected characteristics. As mentioned earlier, the only notable differences between the samples lies in the fact that the boys, due to sampling procedures, are slightly older than the girls, and both boys and girls in the sibling sample are, on average, younger than the more general cohorts due to our bias toward selecting sibling pairs of high school age. In addition, sibling pairs more often come from rural environments than the overall cohorts, a reflection of the generally larger family sizes in rural areas.

Table 1 Comparison of Selected Characteristics for Sibling Sample and Total NLS Cohorts[a]

Selected Characteristics	Young men		Young women	
	Sibling sample	Total cohort	Sibling sample	Total cohort
Percent living with both parents at age 14	90.1	85.4	86.4	84.6
Percent residing in urban area at age 14	59.1	66.5	62.9	69.6
Mean age (1966 for boys and 1968 for girls)	16.9	18.4	17.8	18.9
Mean ratio of family income in base year to poverty level[b]	2.90	3.06	2.94	2.81
Mean years of education completed by father	11.1	10.6	11.1	10.9

[a] Means and percentages are based on weighted data.

[b] Base survey year is 1966 for the young men and 1968 for the young women. Income information is for the year preceding the survey.

APPENDIX B

DEPENDENT VARIABLES

Attainment

For the separate male and female models (MCAs) a variable is created for each sex. For example, in the case of the probability of completing high school, a dummy variable is created and coded 1 for boys if the highest grade of schooling completed by 1976 is 12 or more years, and zero otherwise. For girls, the reference point for years of schooling completed is 1978. In the difference models (multiple logit), a difference is taken between the dummy probability for boys and the probability for girls. This results in a trichotomous dependent variable with the following categories: (-1) girl completed high school and boy did not, (0) both boy and girl completed or both did not complete, and (1) boy completed but girl did not.

Similar procedures are used in defining the probability of attending and completing college. To have attended college, the youth must have been enrolled at some time prior to and including the tenth survey date (1976 for young men and 1978 for young women). Completion of college requires that they received at least a bachelor's degree by the tenth survey.

In the model for actual educational attainment, the dependent variable is a continuous measure of the highest grade of schooling completed by 1976 (boys) or 1978 (girls) and ranges in value from 0 to 18 years.

Goals

Educational goals are based upon responses to the question "How much more education would you like to get?" As a continuous measure, aspirations range in value from 0 to 18 years of schooling. If the respondent desired no additional schooling, his/her highest grade completed was used instead. The

reference point for obtaining information on goals was the survey following the respondent's eighteenth birthday.

In the two models featuring the probability that the goal is to attend or complete college, the continuous goal measure is put into dummy variable form. For the separate sex models, the variable created for the boys' probability of attending college is coded 1 if the respondent's educational goal is greater than or equal to 13 years of schooling, and zero otherwise. A similar variable is created for the girls. If a respondent has a goal greater than or equal to 16 years of school, he/she is coded 1 on the probability that the goal is to complete college, and zero otherwise.

INDEPENDENT VARIABLES

Siblings Outside of Pair

Variables included in this set are of several types. The number of siblings outside of the pair is simply a continuous measure of family size. It is used in continuous form in the multiple logit equations and categorized into three groups for use in the MCAs: (1) 0 to 1, (2) 2, and (3) 3 or more.

The sex and relative age of siblings outside of the pair are categorized as follows in the MCAs: (1) older siblings are all girls, (2) older siblings are all boys, (3) older siblings include both boys and girls, and (4) there are no older siblings outside of the pair (i.e., the sibling pair are the only children in the family or they are the oldest such that remaining siblings are all younger). In the multiple logit models each of the above categories represents a dummy variable with category (4) omitted as the reference group.

Boy Oldest in Pair

This variable is a dummy variable coded 1 if the boy in the sibling pair is older than the girl, and zero otherwise.

Parent's Education

This variable combines separate information obtained on the highest grade of schooling completed by the respondents' mother and father. Data was taken from the 1966 boys' interview. If data was missing from that interview, information was then taken from the girls' 1968 interview. In order to maximize sample cases, an estimated value for father's education was derived for missing data cases by regressing father's SES and Duncan Index scores on education. The missing data rate for mother's education was minimal.

Categories of parental education used in the MCAs were defined as follows: (1) both parents completed 0 to 11 years of schooling, (2) father completed 0 to 11 years and mother completed 12 or more years, (3) father completed 12 or more years and mother completed 0 to 11 years, and (4) both parents completed 12 or more years of schooling. In the multiple logit models, each of the above categories represents a dummy variable with category (4) omitted as the reference group.

Encouragement

Parental encouragement is measured by the response to the question: "How much encouragement has your father (mother) given you to continue your education beyond high school?" Respondents were allowed the choices of "much, some, or none." This question was asked separately with reference to each parent and was asked in 1970 and 1971 for the boys and 1971 and 1972 for the girls. Data was taken from the second year only in cases where data was

missing from the first year.

A particular problem exists for boys information in 1970 as respondents who were not currently living with the parent in question were not asked about that parent's degree of encouragement. This missing data was not captured in the 1971 interview. On average, respondents in this group come from larger families than boys in the more general sibling sample and are twice as likely to have served in the military (an additional reason for incorporating a military variable in our models). Otherwise these young men show no well defined differences from the overall sample.

Since the questions on parental encouragement were asked independently of boys and girls and separately in reference to each parent, we created a single variable to determine the importance of the relative perceptions between brother and sister. Hence, two variables for the MCAs (one for mother's encouragement and one for father's) contain comparisons categorized as follows: (1) no difference in perception of encouragement between boy and girl (i.e., they perceived the same amount (much/much, some/some) or they perceived the same lack of encouragement (none/none)), (2) girl perceives more than boy (much/some, much/none, or some/none), (3) boy perceives more than girl (much/some, much/none, or some/none), and (4) either the boy or the girl has missing data on the encouragement question. In the multiple logit models, each category represents a dummy variable with categories (1) and (4) combined and omitted as the reference group.

Pair Lived With Both Parents at Age 14

This variable is a dummy variable coded 1 if both the boy and girl said they lived with their mother and father when they were age 14, and zero otherwise.

Oldest in Pair Lived in Urban Area at Age 14

This variable is a dummy variable coded 1 if the oldest respondent in the pair said he/she lived in an urban area (as opposed to a rural-farm or rural non-farm environment) when age 14, and zero otherwise.

Pair Lived in South at Time of Initial Survey

Since for many of the respondents, no measure of geographic area was available that referenced age 14, we created a dummy variable coded 1 if the boy resided in a southern area in 1966 and the girl also resided in the South as of the 1968 survey.

IQ

This variable is a standardized measure of mental ability constructed by pooling scores from different achievement, aptitute and intelligence tests. The construct has a mean of 100 and a standard deviation of 16. Data for the IQ measure was collected from the last secondary school attended by the respondent as of 1968. For further details regarding the separate tests involved and pooling technique see Kohen (1973) Appendix A.

Due to a reasonably high missing data rate on the IQ measure biased toward low ability respondents and blacks, we estimated an IQ score for respondents who were missing data. This involved regressing a "Knowledge of the World of Work" score and the respondent's highest grade of schooling completed on IQ.[1]

In the MCAs, separate IQ variables for boys and girls are combined into a single measure with four categories: (1) both boy and girl have IQs equal to

[1]IQ has been found to be a significant predictor of "Knowledge of the World of Work" scores. See Parnes and Kohen (1975) for further details.

or greater than 100, (2) boy's IQ is equal to or greater than 100 and girl's IQ is less than 100, (3) boy's IQ is less than 100 and girl's IQ is equal to or above 100, and (4) both respondents have IQs below 100. For the multiple logit models, each of the above categories represents a dummy variable with category (1) omitted as the reference group.

Boy Served in the Military

This variable is a dummy variable coded 1 if the boy served in the Armed Forces at any time prior to the 1976 survey, and zero otherwise.

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