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ABSTRACT
                This investigation revives direct impact explanations
of single-parent effects on student performance by further
disagreggation by sex of the student. The effect of living in a
single-parent household on the standardized test scores of students
was estimated separately for males and females through analyses of
data from the High School and Beyond national survey. Results showed
that most of the negative effect of mother-absence continued to be
absorbed by the introduction of the additional independent variables;
however, in cases involving father-absence, the introduction of the
control variables left the direct effect of father-absence with a
positive coefficient, in some cases highly significant.
Additionally, it was found that the science test scores of girls and
the vocabulary test scores of boys tended to "benefit" most from the
direct impact of father-absence. It appears that higher science
scores for girls may be accounted for by traditional sex-role
stereotypes being least reinforced for girls living with their
mothers as contrasted to girls living with their fathers or two
parents. Surprisingly, the effect of economic variables contributed
very little to these regressions. Taken together, these findings
contribute additional documentation of how living with one parent is
associated with student outcomes. Of equal importance, this research
yields a fuller understanding of those conditions which are virtually
unaffected by living with one parent. (Author/LLL)

SEX DIFFERENCES IN VERBAL AND SCIENCE PERFORMANCE FOR STUDENTS

FROM ONE-PARENT FAMILIES: FURTHER TESTS OF ECONOMIC AND

BEHAVIORAL EXPLANATIONS OF A SMALL EFFECT[*]

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SEX DIFFERENCES IN VERBAL AND SCIENCE PERFORMANCE FOR STUDENTS FROM ONE-PARENT FAMILIES: FURTHER TESTS OF ECONOMIC AND BEHAVIORAL EXPLANATIONS OF A SMALL EFFECT

ABSTRACT

Prior investigation has indicated that the direct effect of a missing parent on student educational performance is quite small. When standardized test scores are used as dependent variables in ordinary least squares regression analysis, the inclusion of independent variables describing family background, economic circumstances and behavior patterns seems to account for all of the observed negative effects on academic performance. This investigation revives direct impact explanations of single-parent effects on student performance by further disagreggation by sex of the student. The effect of living in a single-parent household on the standardized test scores of students was estimated separately for males and females through analyses of data from the High School and Beyond national survey. Results show that most of the negative effect of mother-absence continues to be absorbed by the introduction of the additional independent variables; however, in cases involving father-absence, the introduction of the control variables leaves the direct effect of father-absence with a positive coefficient, in some cases highly significant. Additionally, we found that the science test scores of girls and the vocabulary test scores of boys tended to "benefit" the most from the direct impact of father-absence. It appears that higher science scores for girls might be accounted for by traditional sex-role stereotypes being least reinforced for girls living with their mothers as contrasted to girls living with their fathers or two-parents. Surprisingly, the effect of economic variables contributes very little to these regressions. Taken together, these findings contribute additional documentation of how living with one parent is associated with student outcomes. Of equal importance, this research yields a fuller understanding of those conditions which are virtually unaffected by living with one parent.

SEX DIFFERENCES IN VERBAL AND SCIENCE PERFORMANCE FOR STUDENTS FROM ONE-PARENT FAMILIES: FURTHER TESTS OF ECONOMIC AND BEHAVIORAL EXPLANATIONS OF A SMALL EFFECT

Considerable evidence shows that children from single-parent families are at an educational disadvantage, but the exact nature of the relationship remains far from clear. To phrase the question in the most general terms: Is the relationship between single-parentedness and educational difficulty that of a direct cause, an indirect cause, or a co-result?

Perhaps the negative findings are spurious, erasable with better controls on parental education, for example. Or perhaps the academic difficulties of students from one-parent households are the consequence of economic hardship; given that the typical two-parent family is also likely to be a two-income family. Alternatively, the educational disadvantage may be traceable to a single parent's difficulties in adequately supervising a child's behavior or structuring his/her environment. Another possibility is that the absence of a parent directly causes emotional and socialization problems which in turn give rise to educational difficulty. Differential socialization resulting, for example, from the one-parent family configuration of gender of parent and offspring may be reflected in verbal and science performance. Finally, it may be that the same stresses which cause marriages to break up also impact negatively on children in such a way as to stunt their intellectual development.

Prior investigation (Mulkey, Crain and Harrington, 1991) has indicated that the direct effect of a missing parent on student performance is small. When standardized test scores are used as dependent variables in ordinary least squares regression analysis, the inclusion of independent variables describing family background, economic circumstances and behavior patterns seems to account for all

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of the observed negative effects on academic performance. The coefficient attached to the dummy variable indicating absence of a parent dwindles to insignificance. However, the possibility remained that the class of direct impact explanations could be revived by further disaggregation by sex of the student of the information about parental absence.[1]

Specifically then, we asked whether the effect of the missing parent would prove significant in analyses which controlled for the sex of the student as well as that of the missing parent. Our paper contributes further evidence to inform this debate by analyzing the separate effects of father-absence and mother-absence and sex of student, on student's high school standardized test scores, using parent and student behavior and family economic status as competing intervening variables to explain the effects.

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[1] In the Mulkey, Crain, and Harrington research (1991), while significant effects were found for males versus females in one-parent households, female versus male student science performance did not appear to depend upon whether the student lived with a mother as opposed to a father. The literature, however, led us to expect differences. To further test how the sex of the student interacts with the sex of the parent in its effects on test performance, we decided to partition by the sex of the student. Because the mother- and father-absence variables are constructed so that students in father-absent families is one of the two attributes, the other being students in two-parent families, selecting by the sex of the student removed (eliminated) the opposite sex students living in two-parent families, from the sample. Thus, female students living with their mothers only would be compared with female students living in two-parent households. The partitioning of the variance in this manner, we thought might clarify any interactions. We did not use analysis of variance (ANOVA) to test for interactions because we felt that the dummy coding of sex as 1 and 2 confounded the interpretation of any interactions. Since theory suggested that we take into account males and females separately, we used a linear decomposition of variance technique to isolate or divide the effects.

Intergenerational Consequences of Family Structure on Educational Performance

Studies indicate that living in a one-parent family has a negative but weak effect on standardized test scores. Hetherington, Camara, and Featherman (1983) review several studies concluding that children in one-parent families score lower than children in two-parent families, with the differences less than a school year. They argue some of these studies may overstate the negative effect of family structure by not adequately removing the effects of the socioeconomic status (SES) of the family prior to parent loss. Ware and Lee (1988) report non-significant effects of one-parent family structure on students' test scores. Milne, et al. (1986), find lower vocabulary and reading test scores for children from father-absent households; however, their model, built to look at mother's employment, does not indicate whether controls on pre-dissolutioon SES would explain away the lower scores. Thompson, Alexander, and Entwisle (1988) find that the absence of a parent lowered black verbal and quantitative achievement test scores.

According to Zimiles and Lee (1988), white single-parent families and reconstituted (i.e., a parent plus a stepparent) families have small negative effects on both grades and test scores; remarriage seems not to solve the problems of marital disruption. Heatherington, Camera, and Featherman (1983) find that family breakup typically has a moderate negative effect on student grades. Furstenberg, Morgan and Allison (1987), and Thompson, Alexander and Entwistle (1988) also find this.

Reasons for Intergenerational Consequences of Family Structure on Educational Performance

Behavioral Explanations

If students in a single-parent household have lower test scores and grades, it may be because they have more behavioral problems. Parental absence may have negative effects on children's socialization and supervision, by interfering with the transmission of appropriate norms and values. Some socialization theorists claim that parent-absence is no more harmful than the parental conflict in many two-parent families, but others argue that the absence of one parent is generally worse, since it alters the family's methods of making decisions and weakens parental control over the behavior of the children (Keith and Finlay, 1988). Mother-absence is more harmful than father-absence for blacks, and loss of a parent through death is as harmful as loss via divorce (Crain and Weisman 1972); these findings suggest that neither lower income nor parent emotional problems are the principal causes of children's disadvantages, thus simple parent-absence is the only remaining explanation.

Findings from other studies add to the evidence that behavior is the most reasonable explanation of one-parent family effects on educational performance (Furstenberg, Morgan, and Allison, 1987; Peterson and Zill, 1986; Hetherington, Cox, and Cox, 1977). These researchers report significant strong negative effects of marital disruption on children's social and psychological problems, including school misbehavior and school suspension. In the year following divorce, children become more dependent, disobedient, aggressive, demanding, and less affectionate. There is also more delinquency in father-absent homes according to Wilson and Herrnstein (1985). Youngsters living with both natural parents are less susceptible to pressure from their friends to engage in deviant behavior than

youngsters liv...g in either one-parent families or in "reconstituted" families (Steinberg, 1987). Aggressive behavior and more arrests are prevalent among African-American adult children of one-parent families (Crain and Weisman, 1972).

The relatively, longer-term dysfunctioning resulting from living in a one-parent household might also suggest that behavioral problems account for the poorer educational performance of these students. Research indicates that adult children from one-parent homes have lower incomes (Mueller and Cooper, 1986; Crain and Weisman, 1972) than those from two-parent households. Crain and Weisman speculate that this is the consequence of more frequent job-changing.

Another reason why we would expect living in one-parent households to lower both grades and achievement is that it is strongly correlated with school drop-out rates. Living in a mother-only family decreases the likelihood of completing high school by about 5 percent for white children and 13 percent for black children (McLanahan, 1985). Living with two parents significantly decreases the probabilities of dropping out of high school for white, Chicano, Cuban, and Prican students, although the size of the coefficient is very close to 0 for non-Hispanic whites (Velez, 1989). Growing up in a one-parent family reduces educational attainment by one-half to one year, depending on which racial group or year is analyzed (Duncan, Featherman, and Duncan, 1972; Featherman and Hauser, 1978). Parental divorce is associated with lower educational attainment for whites of both sexes (Keith and Finlay, 1988). Single-parent upbringing has a significant negative effect on black high school completion (Crain and Weisman, 1972).

One explanation of why children from one-parent families have high drop-out rates is their early incidence of intercourse, marriage, and pregnancy, along with difficulties in opposite-sex relationships. Results from some studies indicate that a father's presence in the family does not significantly affect sex and race differences in having intercourse (e.g., Furstenberg, Morgan, Moore, and Peterson, 1987), but

there is also evidence that one-parent family status is associated with greater teen sexuality and pregnancy (Udry, 1988; Udry and Billy, 1987). Lack of supervision of early dating patterns, which is more common in mother-only families, is an important determinant of early pregnancy (Hogan and Kitagawa (1985).

Economic Deprivation Explanations

Herzog and Sudia (1973) conclude that the only well-documented disadvantage of being raised in a father-absent household is that the household is likely to be poor; this implies that higher pay for women and widespread child support will completely meet the needs of these children. McLanahan (1988), however, finds that economic deprivation does not provide a complete explanation of the transmission of problems from single-parent families to the next generation. She reports that differences in income explain about half of the association between family structure and matriculation among whites, and very little of the tendency of daughters of single mothers to become heads of such families themselves.

The issue is complicated because the majority of researchers construct a single SES scale which combines variables which predate family breakup and measure educational resources (such as mother's education, or number of siblings), with income (which is partly a consequence of family breakup) (Garfinkel and McLanahan, 1986). Hetherington, et al. (1983) locate a few studies having good income information to support an economic deprivation hypothesis. They find income to be important in explaining differences in school performance and high school dropout rates.

Economic and Behavioral Explanations of a Small Effect

In a test of the economic and behavioral explanations of the effect of living in a single-parent household on high school students stanrardized test scores, Mulkey, Crain and Harrington (1991) observed students from one-parent households to

have significantly lower test scores than those from two-parent households. Students from one-parent households have test scores about 0.30 standard deviations lower, but this seems to be entirely explained by differences in race/ethnicity, educational level of parents and sex of student. These significant effects suggested that gender stereotypes preceding the marriage dissolution are possibly reinforced differentially after the marriage dissolution. While the small effect of parent absence on student scholastic performance is explained in the literature primarily by background characteristics, the manner in which the sex of a student might interact with the sex of his/her single parent in affecting student academic performance is not documented. Lee (1988) suggests examination of socialization and attitudinal processes that perpetuate the unequal representation of females in scientific fields. Females are not likely to be interested in those scientific fields where a high degree of preparation in mathematics is a requirement and this deficiency reflects the constant female disadvantage of forty to fifty points on the Scholastic Aptitude Test. We asked, how then might family structural variables be related to sex role stereotypes, and academic performance?

The possibility remained that the class of direct impact explanations could be revived by further disaggregation by sex of the student. We speculated that the effect of the missing parent would prove significant in analyses which controlled for the sex of the student as well as that of the missing parent. Our model was designed to partition by sex of student (see footnote 1.).

CONCEPTUAL MODEL

The variables in our conceptual model permitted us to test several specific questions.

Are male versus female children from one-parent households differentially educationally disadvantaged, net of those ethnic, SES, and community context variables which are not caused by family structure?

Can any educational disadvantage of male versus female children in a one-parent household be attributed to the child's maladaptive behavior patterns?

Can the educational disadvantages to male versus female children in one-parent households be attributed to their lower family income resulting from the marital dissolution?

METHOD

The model shown in Figure 1 allowed us to estimate the effects of father-

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Figure 1 about here

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absence and mother-absence on test scores and identify some of the mechanisms through which household composition affects student performance. The variables were entered into multiple regression equations[2] in two separate blocks; within each

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[2] Cases with missing data were deleted only from those correlation coefficients where one of the two variables was missing (referred to as "pairwise deletion of missing cases" in *SPSS^x* [1989]). The effect of father- or mother-absence on vocabulary test scores were much weaker when all cases with any missing data were deleted ("listwise deletion of missing cases"). The conventional view is that listwise deletion is the more conservative strategy; but in this case it seemed to produce inaccurate results (when our preliminary findings were compared to previous analyses using the same data [e.g., Milne, et al., 1986]). We explored this, and found that the cases with large amounts of missing information on variables used in our model, showed stronger correlations between family structure and test scores than did the cases with less missing data. For example, the correlation between father-absence and test score was -.30 for students with missing data on number of siblings, and -.12 for those with sibling data present.

block, non-significant variables were eliminated with stepwise regression. Block 1 consisted of early family background variables — race, sex, number of siblings, urban, rural, or suburban residence, and parental educational attainment. Block 3 consisted of family economic conditions and a number of parental and student behavior variables.

Since the effects of the independent variables were always in the expected direction, we used a one-tailed significance test at the .05 level.[3] We used the sophomore cohort of High School and Beyond (HS&B). This is a longitudinal (panel) survey, conducted by the National Opinion Research Center for the National Center on Education Statistics (1980). We used test scores, transcripts, and survey responses of 15,000 students as sophomores in 1980 and seniors in 1982.

Variables

The variables and their means and standard deviations are listed in Table 1. Selected variables require additional discussion.

Table 1 about here

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1. Early Family Background

Mother's and Father's Education variables were student reported in five steps, from less than high school to a graduate degree. The education of the missing

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[3] We adjusted the significance level to allow for the fact that the sample was not simple random. We used a mean root design effect of 2.4 which is based on the estimated true standard error of the vocabulary and science test scores (Sebring, Campbell, Ghisberg, Spencer, and Singleton, 1987). We also used this for GPA; this is probably conservative. Specifically, we ran the regression equations using weights equal to 1/100th of the published weights (which weight the sample up to the national population and required a *t*-value greater than 4.5 for significance).

parent was not used as a measure of family socioeconomic status, because data was often missing or difficult to interpret.

2. Family Structure

Mother-absence and *Father-absence* variables were two dichotomous variables which compare students from either mother-absent or father-absent households, to students from two-parent households. Thus a student from a father-absent household (or a household with neither parent) is defined as missing on the mother-absent variable and mother-absent students are missing from the father-absent variable. A father-absent family includes a mother or stepmother with no father, stepfather, or grandparents present (since a grandparent might play a parental role).[4] A mother-absent family similarly includes a father or stepfather and no mother, stepmother, or grandparents. A two-parent family may have regular or stepparents, and may include grandparents. Mother- and Father-absence were coded so that a *1* referred to the absence of the father (or mother) and *0* referred to a two-parent family.

3. Parent and Student Behavior and Economic Condition

Behavior variables indicated both parental and student behavior. Student's were asked about their after-school activities: how much time they spent *Visiting friends, Reading, Dating, Driving around,* and *Watching T.V.* Students were also asked about their school behavior: how often they were *Absent* from and/or *Late* for school, and how much *homework* they did. They were also asked, "How often do you come to class and find yourself *without* these things?: pencils or paper, books, your homework done." Other variables measured parental behavior. Students were asked to agree or disagree that "My parents almost always know where I am and what I am doing." They were asked how much time they spent

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[4] Grandfather or grandmother are not distinguished in the HS&B questionnaire.

talking to parents. There were several other parent-related behavior variables: whether the student went to *Kindergarten,* whether the mother or father *Monitored homework,* and whether the student *Changed schools* since the fifth grade.

Economic condition variables were student-reported: *Total Annual Family Income, Number of Rooms in the Residence,* and whether the *Residence is Rented or Owned.* Economic condition of the family was measured by income, home size and home ownership. Home size and home ownership are important economic variables since they seem to relate to the way in which economic resources can be used to select the child's social context. Children in large houses tend to be near other children living in large houses, and children whose parents own their homes live in the same location longer, and play with children who are also geographically more stable. Two other parental behaviore variables, requiring the child to *change schools* and to *attend kindergarten,* may also be related to parental housing and employment opportunities.

4. Educational Performance

Student educational outcome measures were sophomore vocabulary and science test scores. Vocabulary scores represent an achievement developed in the early grades, similar to reading or elementary mathematics; science scores not only represent a different skill, but reflect material learned in the first two years of high school.[5]

RESULTS

Effects on Test Scores Separately for Males and Females

Tables 2 and 3 display regression equations for vocabulary scores on father-

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[5] Science, writing and civics tests were included in the HS&B battery specifically to measure skills learned in high school. See Heyns and Hilton (1982). We used sophomore scores to minimize the effects of difference in high school curricula.

Tables 2 and 3 about here
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and mother-absence, with and without controls on family background and the other potential intervening variables. Because of the way mother-absence and father-absence were constructed, and because the education of the missing parent is never used, four separate sets of regression equations had to be computed, subdivided according to the sex of the single parent and of the student. The observations in Table 2 appear to associate a negative effect with mother-absence when the variable appears by itself, however the effect is insignificant for both boys and girls.

In contrast, the effect of father-absence is significantly negative in both equivalent columns of Table 3. When the control variables are added in clusters, the effect of mother-absence is eventually reduced to almost a complete washout for both boys and girls. Oddly though, the negative effect of father-absence reverses its sign with the introduction of the controls, and in the case of boys, ends up taking a positive sign which is insignificant at $p > 90\%$, although not at $p > 95\%$. This suggests that after allowing for differences in background, economic status, and behavioral monitoring of the student, the effects of father-presence, which are not absorbed into any of these categories, represent on the whole, negative influences on the student's performance.

When science test scores are used as the dependent variable in Tables 4 and 5,

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Tables 4 and 5 about here
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the results are similar up to a point. Again the coefficients associated with mother-absence begin as borderline significant negative values when there are no controls, and approach more indistinguishably close to zero from the negative side as controls are introduced. Father-absence begins as a more significantly negative

influence than mother-absence when it appears alone, but is converted in one case to a significantly positive influence after the introduction of the controls. The difference is that when science scores are the dependent variable, it is in the case of daughters rather than that of sons, that students from father-absent families do "better." The influence of father-absence also take a positive sign in the case of sons' performance, but is insignificant.

How do we account for the supposed benefits of father-absence, and the apprently nonuniform distribution of those benefits by subject and sex of child? We suggest two classes of explanation[6]. It may be that families with two parents present may have a greater tendency to pattern their children's allocation of scholastic energy and effort according to specific sex roles, while single-parent families fail to fully present such alternative role choices to the students. Thus one might alledge that girls' science scores seem to benefit from father absence more than those of boys because the presence of both parents in the home somehow makes clearer to daughters that scientific study is to be considered a male preoccupation. In the vocabular tests, it appears that male students benefit slightly more from father-absence than do female students, perhaps again because traditional views of sex roles are more effectively transmitted in the context of a two-parent home. If so, are there unwritten rules which discourage boys from investing as heavily in their language skills as girls? The evidence is less convincing, and the case less strong here.

The other class of possible explanation for the impact of father's absence addresses why, for both sexes, the coefficients appear to take on positive signs, albeit not always significant, after the introduction of the control variables. It will be noted that in at least three of the four father-absent series of regressions,

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[6] If the explanation posited by Mulkey, Crain and Harrington (1991), that economic factors are correlated with the presence of a parent, is viable, then we would not expect to find differential performance for girls and boys.

excepting the series involving the science scores of sons, the introduction of the income control variables is coincident with a major change in the sign of the father-absence variable. This is the case, in spite of the fact that overall, the economic variables appeared to contribute relatively little to the overall explanatory power of the regression.

It may therefore be that in families of equivalent income level, the children tend to do relatively better in both vocabulary and science tests when the father is absent because the mother's very ability to maintain an income comparable to that of a twoparent or father-only family is indicative of substantial educational resources. Or, to phrase it in the negative, Mulkey, Crain and Harrington (1991) note that "Any father alone or two parents who only earn as much as a typical single mother, probably have poor educational resources." This presupposes implicitly that job market performance is a better proxy for academic ability in the case of male parents than in the case of female parents. Two-parent or father-only families with low incomes probably lack educational resources, while mother-only families with low incomes do not, or do not necessarily lack them to the same degree. Thus, after the income control variables are entered to absorb the direct effects of income differences on student performance, father-absence appears to take a positive sign.

SUMMARY AND CONCLUSION

The research presented in this paper has attempted to shed some additional light on the issue of how parental absence influences student academic performance. Disaggregation of the sample according to the sex of the student does present evidence that the effects of father-absence are not felt equally by sons and daughters with respect to all academic subjects. In all cases most or all of the negative influence of parental absence is explained away by the inclusion of categories of variables which correspond roughly to three different classes of explanation.

Certain background characteristics which may simultaneously influence student performance directly and predispose the family towards breakup do appear to account for large portions of the initially observed negative effect of parental absence. Also, significant shares of the negative effect do disappear when direct evidence about family discipline and behavior controls are included in the model, lending some support to the hypothesis that what is harmful about single-parent families is the lack of sufficient "eyes and hands" to effectively guide the child towards behavior patterns conducive to academic success.

Noteworthy for their apparent lack of explanatory power are the variables purporting to represent family economic status. Is this non-result spurious or does it represent a reliable indication that opportunity to do well in early schooling is fairly independent of economic status? It would be desirable to base such a conclusion on a better constellation of economic indicators than those provided by this data set. In particular, it is unclear how much reliance should be placed on the "income" variable which was obtained from questionnaire data provided by the students. Furthermore, the presence of two parents rather than one in the household implies extra consumption needs as well as extra earning capacity, and these needs may often be in competition with those of the student, further blurring the relationship between income and scholastic achievement. This approach could ideally be taken still further, by exploring the interaction between income and the number of siblings to make an even more accurate appraisal of the resources available to support academic strivings of the individual child. Nevertheless, when taken at face value, these results must be considered as unsympathetic to that class of explanatory linkages which emphasize the economic impact of parental absence upon children's school performance.

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Table 1. Coding of Variables and Means for Students in Two-Parent, Mother-Absent, and Father-Absent Households (standard deviations in parentheses)

Variable	HSB Source[a]	Coding[b]	Two Parents	Mother-Absent	Father-Absent
Father-absence	BB036A-K	1=no father or stepfather 0=two parents	—	—	—
Mother-absence	BB036A-K	1=no mother or stepmother 0=two parents	—	—	—
Father's educ.	BB039	1=less than high school 5=any graduate degree	2.54 (1.25)	2.51 (1.27)	2.53 (1.24)
Mother's educ.	BB042	1-less than high school 5-any graduate degree	2.38 (1.03)	2.33 (0.99)	2.32 (1.06)
Student's sex	SEX	1=male 2=female	1.51 (0.49)	1.50 (0.50)	1.52 (0.49)
Black	RACE	1=black 0=all other	.08 (0.27)	.12 (0.32)	.26 (0.44)
Hispanic	RACE	1=Hispanic 0=all other	.11 (0.32)	.15 (0.36)	.15 (0.35)
Other ethnic	RACE	1=Asians, Native Americans, etc. 0=black, Hispanic or White	.02 (0.15)	.03 (0.18)	.02 (0.15)
Siblings	BB096A-E	number of siblings in family (maximum=11)	2.89 (2.18)	2.85 (2.32)	3.11 (2.46)
Suburban	HSURBAN	1=suburban 0=urban, not rural	.25 (0.50)	.24 (0.50)	.26 (0.50)
Urban	HSURBAN	1=urban 0=suburban, not rural	.28 (0.39)	.28 (0.38)	.27 (0.43)
Income	BB101	1=$6,999 or less 7=$38,000 or more	4.34 (1.67)	3.92 (1.60)	3.03 (1.61)
Rent or own	BB102	1=own 2=rent	1.24 (0.56)	1.39 (0.61)	1.53 (0.63)
Number rooms	BB103	1=one room 10=10 or more	7.13 (1.85)	6.34 (1.91)	6.19 (1.93)
Mother works (high school)	BB037A	1=did not work 2=part-time 3=full-time	2.11 (0.85)	2.21 (0.84)	2.48 (0.78)
Mother works (elem. school)	BB037B	1=did not work 2=part-time 3=full-time	1.93 (0.86)	2.12 (0.85)	2.30 (0.82)
Mother works (pre-elem. school)	BB037C	1=did not work 2=part-time 3=full-time	1.68 (0.86)	1.89 (0.88)	2.02 (0.91)
Parents keep track	BB046C	1=true 2=false	1.16 (0.37)	1.24 (0.43)	1.23 (0.42)

Changed schools (since grade 5)	YB011	1=yes 2=no	1.56 (0.97)	1.78 (1.06)	1.85 (1.11)
Kindergarten	YB012	1=yes 2=no	1.13 (0.34)	1.16 (0.37)	1.14 (0.34)
Talk with parents	BB047G	1=rarely or never 2=less than once a week 3=once or twice a week 4=every day or almost every day	2.22 (1.14)	2.13 (1.13)	2.34 (1.16)
Visit friends	BB047A	1=rarely or never 2=less than once a week 3=once or twice a week 4=every day or almost every day	2.78 (1.03)	2.79 (1.11)	2.82 (1.08)
Dating	BB047C	1=rarely or never 2=less than once a week 3=once or twice a week 4=every day or almost every day	2.05 (0.96)	2.15 (0.99)	2.13 (0.98)
Driving	BB047D	1=rarely or never 2=less than once a week 3=once or twice a week 4=every day or almost every day	2.30 (1.09)	2.30 (1.10)	2.22 (1.10)
Watch T.V.	BB048	1=no television 7=5 or more hours a week	4.93 (1.68)	4.74 (1.73)	5.06 (1.71)
Reading	BB047B	1=rarely or never 2=less than once a week 3=once or twice a week 4=every day or almost every day	2.19 (1.14)	2.30 (1.15)	2.22 (1.12)
Absence	BB016	1=never 7=21 or more times	2.18 (1.27)	2.67 (1.53)	2.51 (1.43)
Lateness	BB017	1=never 7=21 or more times	1.99 (1.23)	2.19 (1.41)	2.32 (1.42)
Does homework	BB015	1=no homework 2=don't do homework 7=more than 10 hrs./wk.	4.68 (1.26)	4.57 (1.38)'	4.58 (1.28)
Brings homework	YB016C	1=usually bring 4=never bring	2.88 (0.78)	2.86 (0.80)	2.81 (0.84)
Brings books	YB016B	1=usually bring 4=never bring	3.41 (0.73)	3.32 (0.83)	3.34 (0.82)
Brings paper	YB016A	1=usually bring 4=never bring	3.16 (0.81)	3.10 (0.86)	3.07 (0.89)

Vocab. test	YBVOCBSD	vocabulary test scores (standardized within grade to mean=50, SD=10 [ETS])	50.76 (9.86)	49.66 (10.29)	48.10 (9.87)
Science test	YBSCINSD	science text scores (standardized within grade to mean=50, SD=10 [ETS])	50.94 (9.63)	49.55 (9.69)	48.02 (10.07)
N			9,578	361	1,767

[a] These are the variable names assigned by HS&B.

[b] Minimum and maximum values are shown for some variables because of space limitations.

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Table 2. Estimates of the Effects of Living in a Mother-Absent Family, with and without Controls, on Vocabulary Scores. (unstandardized regression coefficients, betas in parentheses)

(Results for Female Students)

Variable	$(R^2 = .00047)$	$(R^2 = .24134)$	$(R^2 = .26640)$	$(R^2 = .36063)$
CONSTANT	49.56	51.95	47.24	46.55
MOTHER ABSENT	-1.15 (-.022)	-0.53 (-.010)	0.03 (.000)	0.05 (.000)
FATHER'S EDUC.		2.59 (.265)	2.09 (.216)	1.57 (.162)
BLACK		-9.02 (-.295)	-7.97 (-.260)	-7.29 (-.240)
HISPANIC		-6.30 (-.200)	-5.77 (-.153)	-4.95 (-.157)
OTHER ETHNIC		-4.65 (-.066)	-3.52 (-.054)	-4.05 (-.057)
SIBLINGS		-0.49 (-.105)	-0.45 (-.105)	-0.47 (-.105)
SUBURBAN		-1.07 (-.053)	-0.59 (-.029)	-0.54 (-.027)
URBAN		-0.76 (-.030)	-0.63 (-.025)	-0.41 (-.016)
INCOME			0.75 (.130)	0.75 (.125)
RENT OR OWN			-0.57 (-.051)	-0.61 (-.036)
NUMBER OF ROOMS			0.29 (.052)	0.21 (.037)
MOTHER WORKS (PRE)				-0.55 (-.050)
CHANGED SCHOOLS				-0.40 (-.040)
KINDERGARTEN				-1.20 (-.041)
TALK WITH PARENTS				0.35 (-.040)
VISIT FRIENDS				-0.36 (-.036)
DATING				-0.63 (-.067)
WATCH TV				-0.49 (-.092)
READING				1.71 (.193)
ABSENCE				-0.27 (-.034)
DOES HOMEWORK				0.93 (-.112)

(Results for Male Students)

Variable	$(R^2 = .00144)$	$(R^2 = .23525)$	$(R^2 = .24915)$	$(R^2 = .33979)$
CONSTANT	50.30	54.67	50.46	50.45
MOTHER ABSENT	-2.11 (-.035)	-0.54 (-.003)	-0.19 (-.003)	-0.05 (-.001)
FATHER'S EDUC.		2.56 (.232)	2.24 (.232)	1.65 (.173)
BLACK		-5.63 (-.245)	-7.66 (-.245)	-7.49 (-.240)
HISPANIC		-6.91 (-.220)	-6.31 (-.220)	-5.42 (-.199)
OTHER ETHNIC		-2.72 (-.032)	-2.09 (-.032)	-2.52 (-.035)
SIBLINGS		0.40 (-.399)	-0.40 (-.092)	-0.38 (-.079)
SUBURBAN		-1.72 (-.074)	-1.47 (-.074)	-1.53 (-.060)
URBAN		-1.07 (-.035)	-0.95 (-.033)	-0.59 (-.023)
INCOME			0.50 (.055)	0.16 (.091)
RENT OR OWN			-0.39 (-.022)	-0.31 (-.015)
NUMBER OF ROOMS			0.32 (.064)	0.25 (.049)
MOTHER WORKS (PRE)				-0.51 (-.045)
KINDERGARTEN				-2.21 (-.078)
DATING				-0.66 (-.069)
DRIVING				-0.57 (-.062)
WATCH TV				-0.39 (-.066)
READING				1.86 (.205)
DOES HOMEWORK				.50 (.065)
BRINGS BOOKS				0.56 (.069)

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* All nonsignificant (p<.05) independent variables except mother absence are omitted from the equation. A pairwise treatment of missing cases was used.

Table 3. Estimates of the Effects of Living in a Father-Absent Family, with and without Controls, on Vocabulary Scores. (unstandardized regression coefficients, betas in parentheses)z

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(Results for Female Students)

Variable

	$(R^2 = .01393)$		$(R^2 = .24245)$		$(R^2 = .26645)$		$(R^2 = .36093)$	
CONSTANT	50.02		52.21		47.09		46.64	
FATHER ABSENT	-1.35	(-.115)	-1.02	(-.036)	0.27	(.010)	0.55	(.019)
MOTHER'S EDUC.			2.55	(.265)	2.09	(.215)	1.56	(.161)
BLACK			-5.77	(-.290)	-7.92	(-.261)	-7.37	(.243)
HISPANIC			-6.25	(-.195)	-5.75	(-.153)	-4.97	(-.155)
OTHER ETHNIC			-4.64	(-.065)	-3.53	(-.054)	-4.06	(-.501)
SIBLINGS			-0.49	(-.105)	-0.45	(-.105)	-0.47	(-.105)
SUBURBAN			-1.07	(-.051)	-0.59	(-.029)	-0.53	(-.026)
URBAN			-0.54	(-.033)	-0.61	(-.024)	-0.36	(-.014)
INCOME					0.79	(.132)	0.75	(-.130)
RENT OR OWN					-0.59	(-.052)	-0.65	(-.035)
NUMBER OF ROOMS					0.29	(.073)	0.21	(-.035)
MOTHER WORKS (PRE)							-0.60	(-.052)
CHANGED SCHOOLS							-0.40	(-.040)
KINDERGARTEN							-1.17	(-.040)
TALK WITH PARENTS							0.33	(.036)
VISIT FRIENDS							-0.36	(-.036)
DATING							-0.70	(-.065)
WATCH TV							-0.49	(-.052)
READING							1.70	(.193)
ABSENCE							-0.27	(-.035)
DOES HOMEWORK							0.93	(.111)

(Results for Male Students)

	$(R^2 = .00473)$		$(R^2 = .23325)$		$(R^2 = .24967)$		$(R^2 = .34145)$	
CONSTANT	50.51		50.65		50.24		51.05	
FATHER ABSENT	-1.97	(-.069)	-0.24	(-.005)	0.67	(.023)	0.81	(.025)
MOTHER'S EDUC			2.56	(.267)	2.23	(.230)	1.64	(.169)
BLACK			-5.60	(-.275)	-7.76	(-.243)	-7.63	(-.244)
HISPANIC			-5.90	(-.240)	-6.33	(-.223)	-5.45	(-.190)
OTHER ETHNIC			-2.74	(-.042)	-2.06	(-.031)	-2.47	(-.035)
SIBLINGS			-0.40	(-.092)	-0.40	(-.092)	-0.33	(-.077)
SUBURBAN			-1.72	(-.056)	-1.45	(-.073)	-1.52	(-.076)
URBAN			-1.07	(-.042)	-0.95	(-.038)	-0.62	(-.024)
INCOME					0.52	(.093)	0.50	(.055)
RENT OR OWN					-0.44	(-.025)	-0.35	(-.020)
NUMBER OF ROOMS					0.33	(.065)	0.25	(.049)
MOTHER WORKS (PRE)							-0.51	(-.045)
KINDERGARTEN							-2.19	(-.077)
TALK WITH PARENTS							0.26	(.035)
DATING							-0.62	(-.059)
DRIVING							-0.54	(-.060)
WATCH TV							-0.39	(-.065)
READING							1.67	(.205)
DOES HOMEWORK							0.46	(.059)
BRINGS BOOKS							0.81	(.065)

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z All nonsignificant (p<.05) independent variables except father absence are omitted from the equation. A pairwise treatment of missing cases was used.

Table 4. Estimates of the Effects of Living in a Mother-Absent Family, with and without Controls, on Science Test Scores. (unstandardized regression coefficients, betas in parentheses)

(Results for Female Students)

Variable	(R^2 = .0004*)	(R^2 = .24134)	(R^2 = .26640)	(R^2 = .36063)
CONSTANT	45.95	47.24	43.03	43.21
MOTHER ABSENT	-1.525 (-.030)	-0.526 (-.016)	-0.616 (.013)	-0.367 (-.007)
FATHER'S EDUC.		1.557 (.206)	1.525 (.174)	1.030 (.113)
BLACK		-9.447 (-.331)	-8.630 (-.303)	-7.543 (-.275)
HISPANIC		-7.090 (-.239)	-6.695 (-.226)	-5.650 (-.197)
OTHER ETHNIC		-4.229 (-.061)	-3.900 (-.057)	-3.676 (-.055)
SIBLINGS		-0.152 (-.043)	-0.160 (-.035)	-0.145 (-.034)
URBAN			0.731 (.031)	0.673 (.037)
INCOME			0.666 (.115)	0.522 (.092)
RENT OR OWN				-0.254 (-.015)
NUMBER OF ROOMS				0.129 (.025)
MOTHER WORKS (PRE)				-0.454 (-.044)
KINDERGARTEN				-1.146 (-.042)
TALK WITH PARENTS				0.353 (.043)
DRIVING				-0.511 (-.055)
WATCH TV				-0.499 (-.089)
READING				1.194 (.144)
ABSENCE				-0.499 (-.065)
DOES HOMEWORK				0.695 (.115)

(Results for Male Students)

Variable	(R^2 = .00144)	(R^2 = .23525)	(R^2 = .24915)	(R^2 = .33979)
CONSTANT	51.50	49.24	45.10	44.26
MOTHER ABSENT	-2.645 (-.047)	-1.170 (-.021)	-0.692 (-.012)	-0.356 (-.006)
FATHER'S EDUC.		1.561 (.190)	1.504 (.153)	0.959 (.095)
BLACK		-9.461 (-.299)	-8.305 (-.262)	-8.193 (-.259)
HISPANIC		-7.064 (-.243)	-6.352 (-.219)	-5.655 (-.194)
OTHER ETHNIC		-2.715 (-.041)	-1.555 (-.025)	-2.190 (-.033)
SIBLINGS		0.394 (-.090)	-0.395 (-.090)	-0.315 (-.072)
SUBURBAN		-0.670 (-.033)	-0.414 (-.020)	-1.495 (-.051)
URBAN		0.953 (.037)	1.065 (.039)	1.229 (.047)
INCOME			0.501 (.057)	0.467 (.051)
RENT OR OWN			-0.791 (.079)	-0.655 (-.035)
NUMBER OF ROOMS			0.413 (.050)	0.359 (.069)
KINDERGARTEN				-1.336 (-.046)
DATING				-0.602 (-.057)
DRIVING				-0.411 (-.045)
WATCH TV				-0.462 (-.077)
READING				1.161 (.126)
ABSENCE				-0.429 (-.056)
DOES HOMEWORK				.634 (.051)
BRINGS BOOKS				1.111 (.099)

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* All nonsignificant (p<.05) independent variables except mother absence are omitted from the equation. A pairwise treatment of missing cases was used.

Table 5. Estimates of the Effects of Living in a Father-Absent Family, with and without Controls, on Science Test Scores. (unstandardized regression coefficients; betas in parentheses)ᵃ

(Results for Female Students)

	(R^2 = .01393)	(R^2 = .24345)	(R^2 = .00473)	(R^2 = .23525)
CONSTANT	49.29	45.16	42.47	42.11
FATHER ABSENT	-2.636 (-.099)	-0.123 (-.005)	0.53 (.031)	1.04 (.039)
MOTHER'S EDUC.		1.576 (.205)	1.495 (.164)	1.002 (.110)
BLACK		-9.191 (-.322)	-5.574 (-.301)	-5.100 (.251)
HISPANIC		-6.990 (-.236)	-6.630 (-.223)	-5.550 (-.195)
OTHER ETHNIC		-4.152 (-.062)	-3.564 (-.053)	-3.693 (-.055)
SIBLINGS		-0.154 (-.044)	-0.177 (-.042)	-0.143 (-.034)
URBAN		.735 (-.031)	0.714 (.030)	0.943 (.040)
INCOME			0.625 (.110)	0.572 (.101)
RENT OR OWN			-0.472 (-.029)	0.142 (.027)
NUMBER OF ROOMS			0.213 (.041)	-0.315 (-.020)
MOTHER WORKS (PRE)				-0.525 (-.045)
KINDERGARTEN				-1.112 (-.046)
TALK WITH PARENTS				0.334 (.041)
DRIVING				-0.525 (-.039)
WATCH TV				-0.495 (-.090)
READING				1.190 (.143)
ABSENCE				-0.516 (-.071)
DOES HOMEWORK				0.996 (.115)
Multiple R:	.09557	.46675	.46252	.55512

(Results for Male Students)

	(R^2 = .00473)	(R^2 = .23525)	(R^2 = .22952)	(R^2 = .34145)
CONSTANT	51.54	46.50	45.10	44.51
FATHER ABSENT	-3.046 (-.105)	-1.127 (-.030)	-0.105 (-.004)	0.41 (.001)
MOTHER'S EDUC.		1.595 (.194)	1.509 (.154)	.959 (.095)
BLACK		-9.270 (-.293)	-5.306 (-.261)	-5.206 (-.239)
HISPANIC		-7.056 (-.242)	-6.355 (-.219)	-5.656 (-.194)
OTHER ETHNIC		-2.737 (-.041)	-.394 (-.090)	-2.154 (-.033)
SIBLINGS		-0.394 (-.090)	-0.394 (-.090)	-0.315 (-.072)
SUBURBAN			-0.417 (-.023)	-0.496 (-.025)
URBAN		1.343 (.052)	1.006 (.039)	1.227 (.047)
INCOME			0.49 (.057)	0.469 (.052)
RENT OR OWN			-0.796 (-.044)	-0.697 (-.039)
NUMBER OF ROOMS			0.414 (.050)	0.360 (.070)
KINDERGARTEN				-1.337 (-.046)
DATING				-0.603 (-.060)
DRIVING				-0.411 (-.044)
WATCH TV				-0.461 (-.077)
READING				1.160 (.126)
ABSENCE				-0.433 (-.057)
DOES HOMEWORK				0.635 (.061)
BRINGS BOOKS				1.114 (.056)
Multiple R:	.10472	.45964	.47950	.54602

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ᵃ All nonsignificant (p<.05) independent variables except father absence are omitted from the equation. A pairwise treatment of missing cases was used.

Figure 1. The Conceptual Model

Block			
(1)	(2)	(3)	(4)
Early Background	*Family Structure*	*Economic Condition*	*Educational Performance*
Race/Ethnicity	Mother-absence	Income	Test scores
Mother's education	Father-absence	Rent	
Father's education[a]		Number of rooms	
Student's sex		*Parental Behavior*	
Siblings		Parents keep track	
Urban		Talk with parents	
Suburban		Mother works	
		Changed Schools	
		Kindergarten	
		Student After School Behavior	
		Visit Friends	
		Dating	
		Driving	
		Watch T.V.	
		Reading	
		Student School Behavior	
		Absence	
		Lateness	
		Does homework	
		Brings homework to class	
		Brings books to class	
		Brings paper to class	

[a] Used only in models estimating the effects of mother-absence.