

THE IMPACT OF DIVORCE ON THE LIKELIHOOD OF GRADUATING FROM HIGH SCHOOL BY
AGE 20

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By

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ABSTRACT

Research has shown negative associations between marital instability and success metrics among children of such families. Among the negative academic outcomes is an increased rate of high school dropout among children of divorced and separated parents (Astone, McLanahan, 1991). This paper seeks to determine whether children who experience marital disruption are less likely to graduate from high school than their counterparts whose biological parents remain married.

This study uses a prospective design, only including children whose parents were married at the time of the child's birth and who remained married at the child's outset of high school. Using data from the 1979 version of the National Longitudinal Survey of Youth (NLSY79) and the NLSY79 Child and Young Adult Supplement, I ran a series of probit models to estimate the effects of parental divorce during a child's high school years on the likelihood of that child graduating from high school by the age of 20. The age limit of 20, rather than within four years, diminishes the problem of right-censorship.

Children whose parents divorce during the four years after the normal start of high school are over 9 percentage points less likely to graduate from high school by age 20 than their peers ($p < 0.05$). These findings suggest that a reduction in the rate of divorce may lead to subsequent increase in the incidence of high school graduation. In turn, this ought to lead to improvements in

adulthood outcomes for children, including increased earnings potential and improved overall health. The benefits to society may include increased tax revenue, decreased spending on social-safety-net programs, and reduced crime rates.

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I. Introduction

Previous research has shown negative associations between marital instability and success metrics among children of such families. These negative associations fall across several categories, including but not limited to psychological (Amato, Sobolewski, 2001), academic (Astone, McLanahan, 1991), marital (Amato, Loomis & Booth, 1995), and employment (Biblarz, Raferty, 1999). Among the negative academic outcomes associated with marital disruption and dissolution is an increased rate of high school dropout among children of divorced and separated parents (Astone, McLanahan, 1991).

High school dropout itself has been negatively associated with several measures of success, both short- and long-term, and, as such, is an area of policy relevance. For example, failure to complete high school is associated with lower lifetime earnings, weaker labor force attachment, and marital instability. High school dropouts are less prepared to compete in the labor market than their counterparts who graduate from high school (Tyler, 2009). Marital disruption during adolescence places a young person at particular risk of performing poorly in school and subsequently dropping out. The developmental milestones of the adolescent years include self-definition and goal setting and are often hard to reverse (Musick and Meyer, 2010). The closer a teenager is to high school graduation at the time of parental separation or divorce, the greater the risk of dropout (Musick and Meyer, 2010).

This paper seeks to determine whether high school students who experience marital disruption are less likely to graduate from high school than their counterparts whose biological parents remain married.

In order to investigate the effects of marital disruption on the likelihood of graduating high school, I use a prospective sample of students whose parents are married at the start of the study, yielding two groups for comparison: youth whose parents remain married, and youth whose parents have divorced or separated. I estimate a series of multivariate probit model to estimate the effect of the key independent variable—whether an individual’s parents divorced—on the probability of successful completion of high school by age 20. I control for *demographic variables*, including race and ethnicity, *parental variables*, such as parents’ education level and income, and student characteristics, including the students’ own academic expectations.

The findings from this study are of particular policy relevance. The results may inform policy surrounding provision of counseling for parents of students in high school, or for the students experiencing marital disruption during their high school years. Any marital-disruption effects revealed through this study have the potential to shape curriculum design to facilitate completion by children of parents who are separated or divorced. Findings may also be of interest to policy makers with an interest in marriage incentives and divorce deterrents at various levels of government.

II. Literature Review

a. Demographic Trends in Marriage and Divorce

Trends in marriage have been consistent over the past several decades (Cherlin, 2010). The overall likelihood of an individual getting married at all by age 35 dropped from 94% in 1980 to 88% in 2010 (Elliott et al, 2012). The median overall age of first marriage in 2008 rose to 27.4 years old for men and 25.6 years for women. These figures were 24.0 for men and 20.5 for women in 1950 (Elliott et al, 2012). This retreat from earlier marriage was not exhibited

equally by different races; while 81% of non-Hispanic White women has been married at least once by age 30, that figure is 77% for Hispanic women and only 52% for non-Hispanic Black women (Cherlin, 2010). Education also plays a role in determining likelihood of marriage and age of first marriage. While more-educated women are more likely to get married at some point in their lives, these women are also less likely to marry before the age of 25, allowing them to complete their educations and establish their careers. Indeed, education is becoming so great a factor as to rival the importance of religion in choosing a spouse. As women have become more highly educated, there has been a consistent trend toward marital homogamy in which highly educated individuals tend to marry each other rather than marrying those with lower levels of educational attainment (Cherlin, 2010).

While marriage has undergone a decrease in frequency and an increase in median age, the rates of divorce have decreased over the last three decades (Cherlin, 2010). From a peak aggregate risk of around 50% around 1980, the probability of a marriage ending in disruption now rests in the range of 40 to 50 percent (See Cherlin, 2010). Similarly to marriage, however, the driving factor for changes in trends in divorce seems to be level of education of the members of the union. While the divorce rate of the less-educated has at best remained constant over the past three decades, the probability of marriage dissolution decreased for women with college degrees who married in the early 1990s when compared to their counterparts from the early 1970s (Cherlin, 2010).

b. The Effects and Mechanisms of Divorce

Growing up with divorce parents is associated with negative outcomes for children. In a review of the marital disruption literature, Amato (2000) outlines a set of consequences observed

among children of divorced parents, including diminished academic achievement, increased detrimental conduct, greater difficulty with psychological adjustment, diminished self-concept, and poorer social competence. Over time, studies have revealed reductions in the magnitude and statistical significance of divorce effects, possibly due to the increased prevalence and social acceptance of divorce between the 1960s and 1990s. Another possibility is that parents have become increasingly aware of the potential negative effects of divorce and are taking preemptive measures to mitigate these unfavorable consequences (Amato, 2000).

Despite well-documented differences in the likelihood of social problems among children in martially disrupted versus intact, two-parent families, there is a debate in the literature as to whether this can be attributed to divorce itself or other factors correlated with parental divorce. Stress is prominent among the potential mechanisms through which parental divorce might impact the social and life outcomes of children (see Figure 1, Amato, 2000). Divorce is stressful to children directly as well as indirectly through diminished quality and quantity of parenting due to elevated stress among their parents. The burden of single parenthood can aggravate parental stress as well as leave less time with which the parent can devote attention to his or her child. Total net family income is also likely to decline for the child as divorce leads to the loss of one income in many cases.

Much of the negative association with divorce is related to the disruption of stability that is important to child development. Divorce is often coupled with a move, which itself can be stressful for the children as they lose the sense of stability provided by the home to which they are accustomed and the friends with whom they grew up. Furthermore, the children experience the loss of an attachment figure and undergo a grieving process.

c. Demographic Trends in Graduating from High School

Rates of high school graduation in the United States have decreased in the past three decades (Heckman and LaFontaine, 2010). Where in 1970, 80.8% of all qualifying individuals had graduated from high school, that figure had dropped to 77.1% by 2000.¹ The decrease in high school graduation rates is localized in terms of race to whites, who exhibited a decrease in graduation rates from 83.8% to 81.7%. Individuals in minority groups, in contrast, showed increases in graduation rates, increasing between 1970 through 2000 from 63.7% to 66.4% and from 58.6% to 62.9% among Blacks and Hispanics, respectively.

Gender, too, plays a role in the varying trends in high school completion rates. The drop in high school graduation rates overall is nearly entirely attributable to males. While the proportion of qualifying females who graduated from high school remained largely unchanged between 1970 and 2000, the proportion of qualifying males who attained a high school diploma dropped significantly from 80.8% to 74.1%.

Further predictors of high school completion include total family income and parental educational attainment. Indeed, these, and other measures of family background are described as the most important predictors of educational achievement (Tyler, 2009). While the two are positively correlated with one another, each has been shown to also be positively correlated with the child's educational attainment. Mechanisms for these may include students from lower socioeconomic strata needing to find jobs earlier to help family income and a diminished ability by parents of lower SES students to be involved in their child's education.

¹ Qualifying individuals are defined as 18- through 24-year-olds who were not enrolled in secondary school if born in the second half of a given decade, or 25- to 29-year-olds who were not enrolled in secondary school if born in the second half of a given decade.

Family structure has also been shown to be correlated specifically to likelihood of graduating from high school. As McLanahan and Sandefur (1994) show, children from single parent homes are less likely to graduate from high school than their peers in two-parent homes. This, as Heckman and LaFontaine (2010) point out, is of concern as the number of children in single-parent families is increasing.

d. The Importance of Graduating from High School

Graduation from high school has been linked to several positive life outcomes. Individuals who do not complete high school exhibit significantly lower earnings potential than their peers with high school diplomas, amounting to a lifetime earnings deficit of \$260,000 for high school dropouts compared to those who graduate from high school (Tyler, 2009). In addition to impacting earnings, higher levels of education may lead directly to improved health outcomes to the individual. It is unclear, however, whether increased earnings potential is the proximate cause of improved health, if improved health increases one's ability to earn more over his or her lifetime, or if some combination of the two is at work (Tyler, 2009).

Failure to graduate from high school has similarly been linked to negative impacts to society at large. Such societal costs include reduced federal and state tax revenues, increased crime rates, and greater public spending on unemployment benefits and health care costs (Tyler, 2009).

Finally, high school dropouts have a greater likelihood of experiencing divorce in their lifetime (Amato, 1996). This is significant as divorce is itself linked to several negative outcomes, including an decreased likelihood that the individual's children will graduate from high school, thus perpetuating the cycle of disadvantage.

e. The Importance of Adolescence

Loosely defined, adolescence is the period of a young person's life that bridges childhood with adulthood. Despite comprising up to half of a person's life prior to adulthood, as recently as 2001, research into adolescence has been largely neglected (Dehne and Riedner, 2001). For purposes of convenience, many researchers have set the parameters of adolescence as encompassing ages from 10 to 19 years old, as does the World Health Organization (Dehne and Riedner, 2001). Regardless of exact commencement and conclusion, adolescence is a time of particular developmental importance. Events experienced during this developmental phase can be particularly impactful and hard to reverse (Musick and Meyer, 2010). This may be due to the lack of time necessary to affect a reversal in the negative impact of a psychologically detrimental experience prior to adulthood.

Furthermore, adolescence as a timeframe in which to study the effects of divorce is particularly interesting due to the fact that the occurrence of marital dissolution of a marriage that has lasted long enough to lead into a child's adolescence are not common. A 2012 CDC National Health Statistics report showed that in the years between 2006 and 2010, of the women who divorced within the first 20 years of marriage, only 17% did so after 15 years of marriage. 67% of these divorces occurred in the first ten years of the marriage and 42% occurred in the first five years of marriage. When a couple's first child is conceived and born during the marriage, the likelihood of divorce after 15 year of marriage drops further, with only 15% of a much smaller number of divorces in the first 20 years of marriage occurring after 15 years.

f. Current Study

Given that the probability of divorce varies across race, sex, parental education, total net family income, these variables are controlled in the current paper. While this list is not comprehensive, controlling for these variables can begin to shed light on the portion of the difference in educational attainment between children of divorced parents and children of married parents that is attributable to the divorce itself.

This study differs from previous studies in that it considers the impact of divorce only on those students who began high school with their parents married, limiting the impact to the later adolescent years. Further, this study is less right-censored than previous studies, allowing children up until the age of 20 to graduate from high school rather than the traditional age of graduation at 18.

III. Data & Methods

a. Data

The data for this study are derived from two sources: the 1979 version of the National Longitudinal Survey of Youth (NLSY79) and the NLSY79 Child and Young Adult Supplement, both compiled by the Bureau of Labor Statistics (BLS).

The NLSY79, a longitudinal survey begun in 1979, has followed a sample set of men and women born between the years 1957 and 1964. A total of 12,686 individuals participated in the initial sampling. The ages of the participants ranged between 14 and 22 years old at the time of sampling. The overall sample in 1979 comprised a nationally representative sample of the population of the United States. Between the years of 1979 and 1994, respondents were

interviewed on an annual basis. Subsequently, remaining participants we interviewed on a biennial schedule.² The overall sample is comprised of three subsamples:

- 6,111 youth sampled to be representative of the civilian youth population in 1979
- 5,295 youth sampled to oversample Hispanic, black, and low SES youth
- 1,280 youth aged 17 – 21 in 1979 who, as of September 30, 1978, were enlisted in one of the branches of the military. (Bureau of Labor Statistics, 2001)

In addition to the NLSY79, supplemental data were collected using the Child and Young Adult supplement. This dataset compiles information about the children of the female members of the NLSY79 cohort. Before the children reached the age of 14, data was collected through observation of the children and through interviewing the mothers (who were the “youth” in the NLSY79.) When the children turned 14 years old, they began answering questions directly through the “young adult” questionnaire. Due to the fact that the selection criteria used for this study, which will be discussed in greater detail later, required the information about the children in the year before entering high school (i.e. at age 13), all of the data about the children with the exception of the were gathered from the “child” portion of the CYA79.

Despite the duration of the NLSY79, attrition rates from the survey were relatively low. As of the 2000 sample, retention rates were close to 90%, calculated as the number of respondents interviewed divided by the total number of eligible participants. Funding constraints forced the cessation of interviews for portions of the oversampled military population and for the

² Due to the fact that the participants in the NLSY79 were between the ages of 14 and 22 at the outset of this longitudinal survey, they are referred to as “youth,” regardless of their age at the time of a given survey. At the time of the latest survey used in this study (2010), the “youth” ranged in age from 45 to 53. To avoid confusion in terminology, for the remainder of this paper, the term “youth” or “mothers” will be used in reference to the respondents of the NLSY79, while the term “child,” “children,” or “young adult(s)” will be used when referring to the offspring of the respondents of the NLSY79.

economically disadvantaged white subsample (Bureau of Labor Statistics, 2001). Due to the necessity for no missing data, these individuals were not included in this study.

i. Analysis Sample: A total of 1,012 children were selected for inclusion in this study. Qualification for inclusion is based upon two factors: availability of data across all the variables included in the most restricted model used in the study, and family structure history up to the child's start of high school.

The prospective nature of this study mandated a restriction to individuals whose parents were married at the time of the child's birth and remained married throughout his or her life up to the point of starting high school. This posed some difficulty as there was no readily available variable in either the NLSY79 or the child and young adult supplement that contained this information. As a workaround, I matched the child's year of birth with their mother's response to the question of marital status in that year. Children whose mothers indicated a response other than "married" were removed from qualification. I then investigated the mothers' marital histories in the 13 years subsequent to the child's birth using the NLSY question "Has there been any change in your marital status since [the date of your last interview]?" (NLSY79). This solved the problem of mothers who missed a cycle of interviews for whatever reason and who were subsequently picked back up in a later cycle as the wording of the question requires the mother to think back to the last time she responded to a survey, regardless of the length of time between surveys. The children of any mother who responded that she experienced a change in marital status during that interval were removed from this study.³

³ Upon initial inspection of the follow-up question to the question of whether or not the mother experienced a change in marital status since their last interview ("Since [date of last interview, what was the first change in your marital status]") it became clear that it was not necessary to dig deeper into the nature of the change in marital status experienced as no possible response permitted the child's inclusion in the study.

ii. Variables

1. Dependent Variable: The dependent variable in this study is a dummy variable indicating whether or not the child in question graduated from high school by the age of 20. The age limit of 20, rather than within four years, was selected for two reasons. Not limiting the criteria to those who graduate within four years of starting high school diminishes the problem of right-censorship. I was unable to find any literature that suggested that graduating two years after the normal graduation age has negative impact on any life outcomes of the children. As such, not including as graduates those who graduated by age 20 may overstate the impact of divorce on the life outcomes resulting from divorce's impact on high school graduation. Further, the child and young adult supplement does not provide information regarding when the child started high school, which would have been necessary in order to limit the range of eligible high school graduations to four years after beginning high school.

This variable could not be yielded directly from the NLSY79 data or the child and young adult supplement. Instead, I derived this variable using information provided from the child and young adult supplement regarding the year in which the student received his or her high school diploma and the year of the child's birth.

Young adults were asked to provide responses to the question "When did you receive your high school diploma?" These individuals either provided the year in which they received their high school diploma, or the value for the response to that question was missing. Using the data from every child and young adult supplement available, any minimum value greater than zero in any survey for an individual child was compiled into a column. If no positive number existed in the response for any year, a response of "0" was derived in the year of graduation

column I created, indicating no high school diploma. Because the children in this study turned 21 at different times, it was also necessary to create a variable for age at time of graduation from high school. This was accomplished by subtracting the child's year of birth from the child's year of graduation. The dummy variable used in this study was derived from this variable. Those individuals with a positive number below 21 were marked with a "1" for the dependent variable. All others were given a value of "0."⁴

2. Key Explanatory Variable: The primary explanatory variable of interest in this study is a dummy variable indicating whether or not the child experienced the marital disruption of his or her parents. As described in the analysis sample section of this paper, any child whose mother was married at the time of his or her birth and who did not experience any change in marital status up to and including the survey in which the child was 13 years old, i.e. was still married to the man to whom she was married at the time of the child's birth, were included in this study. This does not preclude the possibility that the person to whom the child's mother was married at the time of the child's birth was not the child's biological father. For the purposes of this study, and due to the fact that there was no information available in the individual surveys indicating whether or not the child's mother was married the child's biological father, I made the assumption that a male spouse married to the child's mother at the time of the child's birth was the child's father. Further, as this study is interested in finding whether or not experiencing the first marital disruption of his or her life during high school, I chose to include these children as they would presumably be similarly impacted by the loss of stability and further negative

⁴ The data were spot-checked by eye to ensure that no values that did not make sense, such as a graduation age of less than 12, existed. Negative numbers indicated that no graduation year was ever provided as the child's year of birth would have been subtracted from the value for missing data (-7) in the year of graduation columns for the individual surveys.

impacts of marital disruption as children whose biological parents split for the first time during the child's high school years.

The explanatory dummy variable was derived by investigating whether or not the mother reported any change in marital status in the surveys during the four years beginning with the survey in which her child would have turned 14.⁵ For those who reported a change in marital status, I looked further into the nature of the change in marital status. I found that all of the mothers reporting a change in marital status during their child's typical high school years reported either a divorce or a separation.⁶ Children of these mothers were marked with a dummy variable of value "1" to indicate his or her parents experienced marital disruption during the child's typical high school years. All other children were marked with a dummy variable of value "0" to indicate his or her parents did not experience marital disruption during the child's typical high school years.

3. Family Background Variables

Mother's education: In order to control for the possible advantage children of better-educated parents have versus their peers with less-educated parents, I included a variable for the number of years of education the mother completed as reported by the mother in the NLSY79. The value reported was expressed as an integer indicating the number of years of schooling the mother completed. The value ultimately used in this study was derived by using the maximum self-reported value in any survey up to her child would be 14 years old. Those children whose mothers never reported a value for number of years of education were removed from the study.

⁵ The age 14 is the age by which children typically begin high school.

⁶ Divorce was indicated by a response value of 2 in the question regarding marital status. Separation was indicated by a response value of 3 in the question regarding marital status.

Total Net Family Income: In order to control for the possible advantage children of higher socioeconomic status (SES) parents have versus their peers with lower SES parents, I included a variable for the child's total net family income as reported by the mother in the NLSY79. These values were reported as a continuous variable representing the amount of net income in dollars that the mother's family accrued in the year of a given survey. The value used in this survey was derived from the mother's response in the survey year in which her child would have been 13 years old.⁷ Because the children in this study would be 13 years old in different years, I controlled for inflation by adjusting the total net family income value to its equivalent value in 2010. Children of mothers who did not report a value for total net family income in the year in which the child would have been 13 years old were removed from the study.

Closeness to Father: I included a dummy variable indicating whether or not the child indicated he or she was close to his or her father as it is likely that a child who is close to his or her father would be more deeply impacted by their parents' separation. The dummy variable used in this study was derived from the child's response to the question "How close do you feel to each of your parents" in the survey at which they would have been 14 years old. Responses to this question were ordinal. Children whose response value was either 4, 3, or 2 indicating extremely close, very close, or fairly close, respectively, were given a dummy value of "1" indicating the child was close to his or her father. Children whose response value was 1 indicating not very close were given a dummy value of "0" indicating the child was not close to his or her father. Children whose response value at age 14 was missing were removed from the study.

⁷ This age was chosen in this and in following variables as it presents a snapshot of the child's life in the year before he or she would typically begin high school.

Children's Educational Expectations: I included this dummy variable to control for the level of education that the children themselves expected to attain. It is very likely that children who did not expect to attain any education further than high school would be less likely to graduate from high school at all. This variable was derived from the children's response to the question "How far do you think you will go in school?" Responses to this question were ordinal. Children whose response value was either 3, 4, 5, or 6 indicating get some college or other training, graduate from college, get more than four years of college, or something else, respectively were given a dummy value of "1" indicating the child expected to attain a level of education beyond a high school diploma. Children whose response value was either 1 or 2, indicating leave high school before graduation or graduate from high school, respectively, were given a dummy value of "0" indicating the child did not expect to attain a level of education beyond a high school diploma. Children whose response value at age 14 was missing were removed from the study.

4. Demographic Variables

Child's Race: I controlled for impact of the child's race by including dummies derived from the information on the child's race provided in the NLSY79 child and young adult supplement. The values to this question were nominal. Children were coded with either a "1," indicating neither black nor Hispanic, a "2," indicating the child was black, or a "3," indicating the child was Hispanic. All children in the study fell into one of these three response categories. I created dummy variables for each race category coding each child "1" or "0" as appropriate. Due to multicollinearity, only the dummy variables for "black" and "Hispanic" were included in the models. There were no children with missing data on race.

Child's Sex: To control for any differences in likelihood of graduating from high school, I included a dummy variable indicating the child's sex. This dummy variable, named "ChildMale" was derived from information on the child's sex provided in the NLSY79 child and young adult supplement. The values to this question were nominal. Children were coded with either a "1," for male, or a "2," for female. All children in the study fell into one of these two response categories. I recoded these values, coding each child "1" for male or "0" for female. There were no children with missing data on sex.

iii. Data Limitations: Despite the volume of information available from the NLSY79, the usefulness of the data is limited by the parameters of this study. The data collected in the NLSY79 and the child and young adult supplement, while longitudinal, are not comprehensive across the years of the survey. There are many cases in which certain questions are not answered in years in which the respondent did complete other portions of the survey. This becomes a problem when such data happen to be omitted in the years of interest, namely in the year before the children are scheduled to begin high school.

Certain data that would be of interest is only available beginning with the children begin filling out the young adult section of the child and young adult supplement on their own. For example, history of depression may correlate negatively with likelihood of graduating from high school and correlate positively with likelihood of parents getting divorced? Omitting variables containing this information may therefore result in the coefficient on the impact of divorce on likelihood of graduating from high school to be negatively biased. While this information is present in the young adult supplement, the children begin taking this survey after beginning high school. It is possible, therefore, that the depression reported by the children in their surveys is in

fact a result of experiencing the marital dissolution of their parents, the reporting of which may lead to spurious effects.

The data available also do not provide exact information needed for an ideal model to be created for this study. An example of this is the need to make assumptions about whether or not the man to which a mother is married at the time of her child's birth is that child's biological father. Ideally, a question would be placed in the child and young adult supplement specifically asking if the mother is married to the child's biological father.

Some variables that would be of interest are not ascertainable at all from the information provided by the questions asked. For example, there is no information regarding the amounts of conflict present in the households of still-married families. This information would be interesting as it may shed light on the mechanisms by which any divorce effect function.

Missing data also limited the number of variables that could be included. Since individuals with missing data for any variable in the most restricted model in this study had to be removed from the study, the inclusion of further variables would have likely reduced the analysis sample to a size too small to be useful.

b. Methodology

An artificial cohort was created by drawing data from several years' worth of the NLSY79 and child and young adult supplement, then using data points from surveys during which each individual child was the same age in their respective surveys.

Using the data from the artificial cohort, I ran a series of probit models to analyze the marginal effects of parental divorce during a child's high school years on the likelihood of that child graduating from high school by the age of 20.

IV. Results

a. Bivariate Statistics

Table 2 compares the compositions of children in the divorced versus non-divorced groups. While there are similar percentages of black children in each category, Hispanic children are overrepresented within the maritally disrupted group and children who are neither black nor Hispanic are overrepresented in the intact family group. There is no statistical difference in the percentage of males across the marital status categories. With regard to family background, there is no statistically significant difference between the average years of education attained by the child's mother for children of differing parental marital statuses. However, there is a highly significant difference in average income, with the families of children whose parents remain married through age 18 averaging a net income nearly \$29,000 higher than those whose parents separate or divorce within four years of their turning 14. Neither the child's own educational expectations, nor their closeness to their father showed statistically significant differences based on marital status. However, the percentage of children who received a high school diploma by age 20 varied significantly ($p < 0.01$) across parental marital status categories. Specifically, children of parents who remain married through at least age 18 succeeding in graduating from high school over 10 percentage point more often than children whose parents divorce in the course of the child attempting high school.

Table 3 presents compositional differences across high school dropouts and those who graduated by age 20. As shown, there is no statistically significant difference in the racial makeup of the two groups. However, all other variables showed differences in means between the two groups. Of note, males make up a greater proportion of the group that did not graduate high school versus those who did—nearly 15 percentage points higher. There is also a marked difference in the net family income of students based on their high school graduation status; those who graduated from high school came from families earning on average over \$14.3 thousand more than the families of those who did not graduate from high school. There is also a difference between the makeup of the two groups in relation to how close the child is to his or her father: fewer than 94% of students who did not graduate from high school reported between close to their father, while nearly 97% of students who did graduate from high school reported the same. Finally, the percentage of children whose parents divorced during high school is nearly twice as large for the children who did not graduate from high school compared to those who did graduate from high school by age 20.

b. Multivariate Probit Results

Table 4 presents results for a series of probit models estimating the likelihood of graduating from high school by age 20. I began with a baseline model including demographic and family background variables. Model 2 adds a variable controlling for the child's own educational expectations. Model 3 further incorporates the effect of parental divorce, and model 4 additionally controls for the child's closeness to his or her father.

I found no statistical significant impact of race. This held true across all models run from the baseline through the most restricted model available. Sex of the child, however, did have a

statistically significant impact on the child's likelihood of graduation. Male students are 6.7 percentage points less likely to graduate high school than their female counterparts when not factoring in divorce, and 7.0 percentage points less likely when divorce is considered.

Family background, too, has a statistically significant impact on likelihood of graduating from high school, though in the case of family income, that impact is not particularly substantively significant. Mother's education plays a strong role in determining the likelihood of a child graduating from high school by age 20. Each year of education reported by a child's mother increases the likelihood of that child graduating from high school by 0.9 percentage points when divorce is factored into the model. In other words, a child whose mother graduated from a four-year college is 3.6 percentage points more likely to graduate from high school than their peers whose mothers attained no more than a high school diploma. This impact is not much-changed from the impact when divorce and the child's own educational expectations are considered, with the impact increasing to one percentage point in the baseline model. Family income is statistically significant at the 95% significance level in the baseline model, though an increase in total net family income of \$10,000 is needed just to affect a one percentage point impact in the likelihood of graduating from high school. This impact is further diminished in both significance (reducing to the 90% significance level) and magnitude (with a \$20,000 increase needed to affect a one percentage point impact in the likelihood of graduating from high school) when divorce is factored into the model.

Not surprisingly, a child's own expectations of his or her own educational attainment has a strongly statistically significant impact on the likelihood of graduating from high school by age 20, with those who do not expect to attain anything higher than a high school degree approximately 12 percentage points less likely to graduate from high school than their peers who

expect more than a high school degree. Interestingly, the inclusion of this variable does little to change the impact of the other variables in the model.

Turning to the primary variable of interest—the experience of parental marital dissolution—there is a statistically significant effect ($p < 0.05$), net of the child’s demographics, family background, and the child’s educational expectations. Children whose parents divorce during the four years after the normal start of high school are over 9 percentage points less likely to graduate from high school by age 20 than their peers. This remains true when the child’s closeness to his or her father is taken into account. This last factor is not statistically significant at any conventional significance level.

V. Conclusions

The results of the probit regressions run in this study indicate a strong impact of divorce on the likelihood of graduating from high school. As expected, other variables factor into educational attainment significantly as well, though controlling for these factors is not sufficient to account for the differences in high school graduation rates between children whose parents remained married through adolescence and those whose parents divorced during the child’s traditional high school years of age 14 through 18. Further, the child’s relationship to the father does not statistically significantly impact the child’s likelihood of graduating from high school controlling for divorce. Likewise, its omission does not bias the impact of divorce by a significant margin.

These findings suggest that a reduction in the rate of divorce may lead to subsequent increase in the incidence of high school graduation. In turn, this ought to lead to improvements in adulthood outcomes for children, including increased earnings potential and improved overall

health. The benefits to society may include increased tax revenue, decreased spending, and reduced crime rates. Nonetheless, policy intervention with the aim of reducing the incidence of divorce in families with adolescent children is certainly more easily suggested than accomplished. Potential policies that directly inhibit divorce would be both difficult to enact and may have repercussions that could exacerbate the issues related to divorce rather than moderate them. The political process in the United States is such that it is very unlikely that any policies that make divorce more difficult, such as a repeal of no-fault divorce laws, would garner sufficient popular support as to pass into law. Further, inhibiting certain divorces may lead to increased levels of conflict and abuse, which are likely to result in worse negative outcomes than seen with divorce.

A more plausible and suitable course of action would be to attempt to reduce the incidence of divorce by creating policy to support marriages that are on the margin of the decision to divorce or not. While it is clear that not all divorces can or even ought to be avoided, there are some for which the detriment of the divorce on the children of the marriage outweigh the benefits. For these marriages, provision or even mandating of counseling may lead to a reduction in the rate of divorce and a subsequent improvement in high school graduation rates and adulthood outcomes of the children. However, these policies are also likely to be difficult to enact as they are expensive and likely to be seen as a governmental extravagance as a time when government spending is of great concern to the public.

Finally, policy could be enacted to counteract the impact of the mechanisms through which divorce negatively impacts adolescents. Income assistance may be provided to newly-divorced mothers, particularly in order to help them find jobs with which they could avoid a move. Improved, more targeted counseling and academic assistance can also be provided at

schools for children experiencing the marital disruption of the family. While these policies also cost scarce funds, the fact that they are meant to assist children rather than two people who don't want to be married to each other any longer may make the policies more palatable to the public.

Despite the statistical significance of the divorce effect seen in this study, the results presented here should still be regarded with caution for several reasons. First, the NLSY79 is not the ideal dataset for this study. The target of the NLSY79 was the mothers of the children under investigation in this study. As such, the sample size of qualifying children was much smaller than would have been ideal. This is particularly true for the group of children whose parents were married at their outset of high school but subsequently divorced in the ensuing four years. The small size of the sample is further exacerbated by a large amount of missing data which, due to the amount of missing data and the relative lack of usable background variables, I was unable to impute in any defensible way.

This study further suffers from the omission of several variables that are very likely to cause significant bias. Some of these variables are omitted for lack of a suitable variable available in the dataset. For example, there is no control for the level of conflict that the children of failing marriages would experience. In other cases, data on a particular variable exists, but was not collected at the appropriate stage of the child's development. For example, measures and histories of depression are not collected until after the child has begun high school. At this point, there is no way of telling if any depression exhibited is a cause of a divorce or a stressor that leads to a divorce.

With the data available, certain assumptions had to be made that may have altered the results. The fact that data was collected only every two years over the course of all the children's

usable data collection means that data was collected for some students in the year in which they ought to have been in 7th grade rather than 8th. In addition, the children's background data was collected from the surveys corresponding to the last year before which they would have turned 14. This was done so as to estimate the start of high school, as 14 is the typical age at which students start high school. However, it is possible that certain children did not begin high school until later, in which case the data was collected too early, or that some children started high school before the age of 14, in which case the data was collected too late.

Finally, the findings of this study only apply to families with children between the ages of 14 and 18, and may not be generalizable to younger children.

Future studies can benefit from data specifically collected from a single cohort of randomly selected 8th graders, all of whose parents are still married. Data collection of background information can occur during that year, with the students followed until age 20. More-tailored data ought also to be collected, such as the level of conflict experienced in the household over the course of the study as well as incidence and history of depression and delinquency. A comparison of children whose parents subsequently divorce over the course of the study and those whose parents remain married will then yield a more accurate conclusion as to the impact of divorce on the likelihood of children graduating from high school, controlling for a greater number of factors that might also contribute to the child's educational attainment.

Tables

Table 1. Means and standard deviations of variables used in analysis

Variable	Mean
<i>Dependent Variable</i>	
Received HS Diploma by Age 20	0.87
<i>Key Independent Variable</i>	
Parents Divorced during HS	0.07
<i>Control Variables</i>	
Child's Race	
Black	0.13
Hispanic	0.20
Not Black, Not Hispanic	0.68
Sex = Male	0.52
Family Background	
Mother's Years of Education	13.92 (2.49)
Total Net Family Income	59.18 (52.69)
Child's Educational Expectations	0.10
Child is Close to Father	0.96
Observations	1012

Source: NLSY79

* Standard deviations for non-dummy variables in parentheses

Table 2. Means and standard deviations of analysis variables by parents' marital status

Variable	Parents Divorced	Parents Not Divorced	P-value for Test Statistic
Child's Race			
Black	0.11	0.13	0.63
Hispanic	0.33	0.19	0.00
Not Black, Not Hispanic	0.56	0.69	0.02
Sex = Male	0.44	0.52	0.16
Family Background			
Mother's Years of Education	13.53 (2.18)	13.95 (2.51)	0.16
Total Net Family Income (Thousands)	32.51 (29.84)	61.31 (53.54)	0.00
Child's Educational Expectations	0.12	0.10	0.57
Child is Close to Father	0.97	0.96	0.67
Received HS Diploma by Age 20	0.77	0.88	0.01
Observations	75	937	

Source: NLSY79

* Standard deviations for non-dummy variables in parentheses

Table 3. Means and standard deviations of variables used in analysis by high school graduation status

Variable	Graduated HS	Did Not Grad. HS	P-value for Test Statistic
Child's Race			
Black	0.13	0.12	0.96
Hispanic	0.20	0.22	0.59
Not Black, Not Hispanic	0.68	0.66	0.67
Sex = Male	0.50	0.65	0.00
Family Background			
Mother's Years of Education	14.01 (2.49)	13.29 (2.42)	0.00
Total Net Family Income (Thousands)	61.01 (54.32)	46.77 (37.82)	0.00
Child's Educational Expectations	0.09	0.21	0.00
Child is Close to Father	0.97	0.94	0.09
Parents Divorced	0.07	0.13	0.01
Observations	882	130	

Source: NLSY79

* Standard deviations for non-dummy variables in parentheses

Table 4. Probit analysis of impact of explanatory variables on likelihood of graduating from high school by age 20

Variable	<u>Model 1</u> Baseline Model	<u>Model 2</u> Adds Educational Expectations	<u>Model 3</u> Adds Divorce Effect	<u>Model 4</u> Adds Relationship to Father
Child's Race				
Black	0.01	0.01	0.01	0.01
Hispanic	0.01	0.00	0.01	0.01
Sex = Male	-0.07**	-0.07**	-0.07**	-0.07**
Family Background				
Mother's Years of Education	0.01*	0.01†	0.01*	0.01*
Total Net Family Income (Thousands)	0.00*	0.00*	0.00†	0.00†
Child's Educational Expectations		-0.12**	-0.12**	-0.12**
Parents Divorced			-0.09*	-0.09*
Child is Close to Father				0.08
Pseudo R ²	0.035	0.049	0.055	0.057
Observations	1,012	1,012	1,012	1,012

† Coefficient significant at the 90% significance level

* Coefficient significant at the 95% significance level

** Coefficient significant at the 99% significance level

Source: NLSY79

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