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The Impact of Parental Marital Disruption on Children's Performance in School

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Abstract

Although it is well-documented that children from divorced or single-parent families have lower performance in school, little is known about whether the timing of divorce is linked to a decline in school performance. In this paper, we examine whether and how the timing of change in parents' marital status influences the odds that a child is held back a grade in school using the Baltimore Parenthood Study, a thirty-year longitudinal study that has tracked the lives of inner-city families. Using logistic regression and hazard analysis, we show that the odds that a child is held back in school increase dramatically around the period of marital dissolution.

INTRODUCTION

Researchers and policymakers alike have become increasingly interested in the ways in which families shape students' performance in school. Factors such as family structure, parental involvement in children's schooling and the characteristics of the literacy environment of the home have been shown to benefit academic outcomes across the years of primary and secondary schooling. Numerous studies have documented that children in single parent families have significantly worse outcomes in school. Moreover, while parents' actions and household characteristics have been shown to shape children's performance, worse performance in school has been shown to be characteristic of both those who have never lived in a two-parent household and those who have experienced disruption of their parents' marriage. However, in the case of divorce, we know little about how the timing of such events shapes schooling trajectories. Does divorce or separation have an immediate impact on children's grades or do the effects appear later in schooling, if at all? Does the conflict that precedes divorce affect students' performance or is the actual separation or divorce the primary influence? Is the turmoil of marital dissolution reflected in a concurrent decline in academic performance?

Developing a clearer picture of whether marital disruptions have an impact on students' success in school is an important step in understanding the interplay between two primary arenas of children's development: family and school. Moreover, understanding the relationship between when marital dissolution occurs and whether difficulties in school follow can provide insight into how divorce affects children. Scholars have long been interested in exploring how temporal aspects of divorce influence children; however, at least in part, the lack of knowledge of the temporal dimensions to how changes in parents' lives influence adolescent outcomes stems from the absence of appropriate datasets. Few studies contain detailed and complete longitudinal data for both parents and children for the years spanning children's primary and secondary schooling. Typically, scholars who have studied intergenerational effects have used either cross-sectional data or panel studies that cover a fairly brief time period. Although these data have been essential in the development of an understanding of the interrelationship of parents and children, they cannot offer the benefits of linked longitudinal data. In this analysis, we examine the question of whether and how marital dissolution influences children's performance in school using a unique, longitudinal dataset: the Baltimore Parenthood Study started by Frank Furstenberg in the late 1960s. The Baltimore Study spans more than three decades of the lives of a cohort of teenage mothers and their first-born children. This unique dataset is ideal for examining the relationship between the disruptive events in mothers' lives and the life course of children.

Moreover, the Baltimore Study contains data on one of the more detrimental events that can occur in a student's educational career: grade retention. Not only is retention an important marker of current difficulties and an excellent predictor of future ones, but the study of grade retention allows us to focus on a more immediate relationship between divorce and school problems. Grade retention data are notoriously difficult to find, but provide a unique advantage by allowing us to study the time period over which the effects of divorce are more likely to be felt.

There is a substantial body of research linking both family structure and changes in family structure, particularly through marital dissolution, with poor educational outcomes. Several studies show that children who grow up in a single-parent household have worse outcomes at many points in their educational trajectories. For example, in data from Baltimore's Beginning School Study, students from two-parent families were significantly less likely to be held back than those with other family structures (Entwisle, Alexander, and Horsey 1997). Drawing on evidence from a number of different national datasets, McLanahan and Sandefur (1994) show that children who grow up in a single-parent family have significantly lower test scores and grades, are more likely to leave school before graduating, and attend school less frequently while enrolled. Consistent with these findings, other researchers have shown that children and adolescents raised in single-parent families are less likely to complete their secondary education than their peers raised in two-parent families (Sandefur, McLanahan, and Wojtkiewicz 1992; Kiernan 1992; Astone and McLanahan 1991).

Changes in family structure via divorce or separation have also been shown to negatively impact children's educational achievements across various points in the education trajectory. In general, children who experience a divorce have lower eventual educational attainment than their peers who experienced no divorce (Sandefur and Wells 1999; Axinn, Duncan, and Thornton 1997). Using data from the National Education Longitudinal Study, Pribesh and Downey (1999) found that students whose parents divorced during the students' high school years had substantially lower scores on standardized reading and math assessments than those whose family structure remained stable over the interval. Disruptions during the primary years of children's schooling careers have also been shown to have a profound impact on educational outcomes. Cherlin and his colleagues (1991) found that children whose parents divorced in the early grades of their children's schooling scored lower on both academic and behavioral measures than their peers whose parents remained married. Marital dissolution as early as the first grade has been shown to heighten the risk of dropping out of school before graduating high school (Entwisle, Alexander, and Horsey 1997). And in a recent pooled time series analysis, Sun and Li (2002) showed that parents' marital disruption was associated with a linear decline in students' test scores.

Thus, there is evidence from numerous sources linking marital dissolution and family structure to poor performance in school. Yet much less is known about what factors are responsible for these differences. While there are numerous potential mechanisms through which a change in mother's marital status might influence her child's performance in school, prior studies have largely focused on one of three sources: financial difficulties, heightened stress, and reduced parental time or poor parenting behaviors.

Financial Difficulties

Divorce and separation have significant and immediate impacts on family income, with single-parent households having sharply lower levels of income. This mechanism of economic hardship, scholars have argued (e.g., McLanahan 1985; McLanahan and Sandefur 1994; White and Rogers 2000), is responsible for reduced levels of economic

resources available for children's education. A sizeable body of research has demonstrated that economic resources are positively related to children's well-being, including educational performance and adjustment in school (e.g., Duncan and Brooks-Gunn 1997; Carlson and Corcoran 2001). In their review of research on the effects of family income on children's odds of completing high school, Haveman and Wolfe (1995) found nearly unanimous evidence that family income has a positive effect on children's eventual educational attainment. Families headed by a single mother have household incomes that are a small fraction of those of two-parent households, and families that experience divorce experience a drop in household income (Pong and Ju 2000). Families living in poverty are often not able to afford the elements of proper nutrition, shelter, and other materials that promote healthy child development (Hanson, McLanahan, and Thomson 1997). However, an increasing number of studies have found that divorce and separation have a negative effect on education net of the loss of family income or other financial resources (e.g., Axinn, Duncan, and Thornton 1997; Boggess 1998)

Stress

Research evidence shows that marital dissolution creates stress for both parents and children (e.g., Wu 1996; Amato 1993) and that both heightened levels of parental conflict preceding divorce as well as the attendant stress of the divorce contribute to children's academic and developmental difficulties (Hanson 1999). A group of studies in this area also have shown that the stresses that accompany divorce often precede the divorce itself (Jekielek 1998; Cherlin, Chase-Lansdale, and McRae 1998; Amato, Loomis, and Booth 1995; Furstenberg and Teitler 1994). Heightened stress for parents has been hypothesized to translate into less effective parenting and lower levels of parental management (McLeod and Shanahan 1993). For children, the stress of separation and divorce is a family event that clearly has implications for school performance. For example, Alexander, Entwisle, and Horsey (1997) argue that the stresses of family disruptions in first grade are associated with greater risks of dropping out of high school, even after controlling for socioeconomic factors, personal resources, and previous school experiences.

Parental Behaviors and Time

Parental time and attention are other important factors contributing to children's performance in school that changes following divorce or separation. Scholars have found that parents' school-related interactions with their children are lower in divorced or single-parent homes. For example, Astone and McLanahan (1991) report that single parents are less involved in their children's school work and less likely to supervise their children outside of the home. Similarly, Hanson, McLanahan, and Thomson (1998) found that mother's educational expectations and level of supervision declined following divorce, although maternal involvement with their children's lives did not. Particularly damaging to children's performance in school is the fact that divorced parents are less involved in their children's schooling in the period following separation or divorce (Sun 2001; McLanahan and Sandefur 1994). Divorce also substantially reduces a child's interaction with his/her noncustodial parent (e.g., Furstenberg and Nord 1985).

In this substantial body of research, however, there has been little study of temporal aspects of this relationship. We know that divorce matters for children's and adolescents' performance in school, yet we know little about whether the *timing* of separation and divorce influences school outcomes. Moreover, the handful of studies that have examined temporal aspects have tended to focus on a small window of time, such as the high school years. For example, Sandefur, McLanahan, and Wojtkiewicz (1992) found that adolescents whose parents divorced in the high school years were less likely to graduate from high school than those whose family structure was stable throughout. Similarly, in examining a cohort of eighth grade children of intact families, Pong and Ju (2000) found that students who experience a divorce in high school are two to three times more likely to drop out before completing their degree, although they conclude that these effects are highly accounted for by income, demographic, and prior schooling factors.

Understanding the temporal link between household dissolution and student performance is essential to untangling the mechanisms through which such disruptions influence children's and adolescents' lives. As Hanson et al. write, "Identifying the timing of changes associated with divorce is particularly important for understanding how divorce influences the resources available to children and subsequently influence child welfare" (1998: 330). In the analyses that follow, we not only ask whether separations affect grade retention, but also whether the timing of these events matters. Drawing on the literature cited above, we hypothesize that children's difficulties in school will be concentrated around the time that parental divorce occurs. While there will likely be enough cases of grade failure not related to divorce to offset the divorce-related ones, we expect to see a sharp increase in the odds of failure in the period immediately preceding the divorce, an increase that persists until a few years after the divorce.

Although there are many possible measures of children's well-being we could examine in this analysis, we focus on grade retention because of its importance as a critical event in the educational life course, with influence into a number of other realms of life. Numerous studies in education have shown that grade retention is both an important marker of current educational difficulties and an excellent predictor of future outcomes and eventual educational attainment (Alexander, Entwisle, and Kabani 2001; Brooks-Gunn, Guo, and Furstenberg 1993; Cairns, Cairns, and Neckerman 1989; Barro and Kolstead, 1987; Fine, 1991). Indeed, one of the most reliable risk factors for leaving school before graduation is prior grade retention and the subsequent condition of being overage for grade (Roderick 1993; Grissom and Shepard 1989). Moreover, the effects of retention persist after controlling for other factors related to school dropout. For example, after controlling for students' socioeconomic characteristics and previous academic performance, Rumberger and Larsen (1998) found that having been retained increases the likelihood that a student will drop out before completing high school. Thus, retention is a key event in the academic life course, one that could have consequences well beyond the year in which it occurs.

In addition to higher odds of dropping out, those who have been retained have significantly lower odds of post-secondary enrollment than those never held back (Fine & Davis 2003; Jimerson 1999). Retention is also associated with lower future earnings and poorer employee competence ratings than poor performing, but non-retained, students (Eide & Showalter 2001, Jimerson 1999). According to Neuharth-Pritchett & Fiske, competence and overall academic achievement also decline following retention (2004).

Retention also has been associated with worse emotional health and more frequent emotional and behavioral problems (Jimerson et al. 1997; Meisels & Liaw 1993). In addition, retained students had lower levels of cognitive competence than a comparison sample of randomly chosen students (Pierson & Connell 1992). Lastly, children above age for their grade – a group primarily composed of retained children – were shown to use drugs more often than children who were age appropriate for their grade (Byrd et. al. 1996).

Our analytical strategy draws on studies of the life course, with two particular features of the life course perspective contributing to our research. The first of these is the concept of linked lives, that the characteristics and experiences of one generation influence the outcomes of another. In this case, we examine how children's outcomes are shaped by events in their parents' lives. It is well known that features and characteristics of children's households shape their academic outcomes; however, the relationship we examine here, that between disruptions in parents' marriages and disruption in children's schooling, are based in an understanding of linked lives.

The second concept is that of the timing of events. As Elder (1974) writes, "[the] developmental impact of transitions or events is contingent upon when they occur in a person's life." Previous studies on the effect of divorce on children have demonstrated that the effects of family structure depend on the phase of life when specific events are experienced (e.g., Krein and Beller 1988). In the particular relationship examined here, considerations for timing of events lead to a restriction of which divorces and separations are included in these analyses. Since we are primarily interested in specifying whether and to what extent a disruption in the mother's life results in a disruption in the child's educational path, we exclude those divorces and separations that occurred before the child entered school. It is not that we believe that disruptions occurring before school have no effect on children's school performance. Indeed, it is highly likely that children who experience a separation or divorce before they begin school are at greater risk of a host of academic difficulties.

We focus on grade retention as our outcome and begin our analysis by examining the timing of grade failure in the educational life course for this group of students. We then focus on the bivariate relationship between separation/divorce and grade retention. Are students who experience a parental separation while in school more likely to be retained? Are the effects of marital formation and marital dissolution equivalent, as some theory predicts? We then evaluate whether the bivariate relationships observed persist in multivariate logistic regression analysis. Finally, we employ proportional hazard models to examine the effects of a set of disruptions on children's educational trajectories, examining the impact of both fixed and time-varying predictors.

The Baltimore Study is a thirty-year longitudinal study (1966-1996) that has tracked the lives of inner-city families in which children were born to teenage mothers. As part of an evaluation of one of the nation’s first comprehensive care programs for teen mothers and their offspring, the Baltimore Study interviewed some 399 adolescent mothers and their parents were interviewed at the time of pregnancy in the mid- to late-1960s. The families in the study were all poor or near-poor; most were black, and living in what now would be called inner-city areas of Baltimore. Although the original set of teenage mothers was not selected as a representative sample, their characteristics were similar to African American youth who became mothers in Baltimore in the late 1960s (Furstenberg 1976). A high proportion of the parents of the teen mothers were themselves teenage parents. Most were poorly educated and unskilled and those who were employed earned low wages. About half of the families were headed by a single parent and a quarter of them were receiving public assistance, high figures by standards of the times.

At several points over the past three decades, extensive demographic, behavioral, and attitudinal data in the areas of work, education, family, social service utilization, and community factors have been collected from three generations (for more detail, see Furstenberg, Brooks-Gunn, and Morgan 1987). Most importantly for this analysis, complete life histories have been collected for both mother and child from the child’s birth through the mid-1990s, when the children were in their late 20s.

Figure 1: Design of the Baltimore Study

<i>Survey Interviews</i>	Time 1	Time 2	Time 3	Time 4	Time 5	Time 6	Time 7
	during pregnancy	1 year after birth	3 year after birth	5 year after birth	17 year after birth	20 year after birth	30 year after birth
Adolescent Mothers	399	388	356	324	290	243	228
Children of Adolescent Mothers				304	296	252	222
Years	1966-68	1968-70	1970	1972	1983-84	1987	1995-96
Avg. Age	16	17.5	19	21	33	36	45

Figure 1 describes the structure of the data and the dates in which the study waves were conducted. In the initial round of the study, 399 women were interviewed as part of an evaluation of one of the nation's first prenatal care programs designed for teens. When they were available, the mothers of the teens were interviewed as well. Three additional waves of the study were conducted between the initial interview and 1972, the year that the "study children"¹ of the mothers were assessed.

Complete life histories of the mothers were initially collected in 1983-4, with detailed information related to women's experiences in the domain of marriages, births and pregnancies, children, employment, education, and welfare. Mothers' life experiences in these areas were updated in the 1987 and 1995-6 interviews. Complete life histories of the study child, covering the same domains, were collected in 1987 and updated in the 1995-6 interview.

Outcome

As noted earlier, we have chosen to examine grade retention as our outcome in this analysis. Specifically, we examine whether or not the child was ever held back a grade in his/her schooling career. The measure we use in these analyses is drawn from mothers' reports about their children's grade retention. In the 1983-4 interview, mothers were asked what grades, if any, their children had repeated for any reason.² We examine only the first occurrence of grade retention in these data.

Predictors

The primary predictor we examine in our analysis is a change in mother's marital status. We look at the effects of all changes in marital status, examining the impact of transitions from unmarried to married as well as from married to separated or divorced. We also look at marriages and at separations and divorces independently.³ The Baltimore Study collected separate data on separations and divorces, and there are some cases in which there is a significant gap between the dates when separation and divorce occur. In these cases, we use the earlier date, which is almost always the date of separation. We choose to use the date of separation rather than date of divorce because the separation represents the point at which the household structure changes and at which the marital change would influence family stress, decline in economic resources and a decrease in parental attention. Although the literature on the impact of entry into marriage is sparse, we chose to examine marriages in addition to separations and divorces because new marriages change the family structure. Marriages could have a negative impact on schooling if they increase the level of family stress for some period following the marriage while everyone adjusts to the new family members and structure. On the other hand, however, marriage can positively influence schooling by increasing the amount of economic resources the family has and providing additional parental attention and supervision.

As noted earlier, although it is possible, if not likely, that marital changes that occur before the child has entered school might have an impact on school performance, in this analysis we restrict our focus to only those changes in status that occur while the child is in school. Changes in marital status occurring before the child entered school are not included. Eliminating the cases with incomplete data for schooling or marital histories yields a sample of 245 mother-child pairs for this analysis.

In addition to these measures, to better isolate the influence of divorce or separation on the odds of retention, we include a limited set of predictors related to characteristics of children and their mothers. Included are a set of socio-demographic predictors, including age, gender, and race. Previous work has shown that retention rates vary significantly by these factors (Entwisle, Alexander and Olson 1997; Jamieson, Curry, and Martinez 2001). We also control for the closeness of the relationship between mother and child while the child was approximately four years of age. We create this measure by summing the number of the following three questions to which the mother disagreed: I do not have enough time to devote to my child; other mothers enjoy their time with their children more than I do; I had my child before I was ready to be a mother. The measure has values from zero to three.

We used a similar strategy to develop a measure of socioeconomic status (SES) at the time that the child entered school. Our measure of SES is created from a combination of data on mothers' education level, income, and use of public assistance at the time the child entered school. Specifically, our combined measure of SES is calculated as the sum of the number of years out of the previous five that she received public assistance (0=all, 1=some and 2=none), her level of educational attainment (1=less than high school 2=GED/ high school graduate, and 3=more than high school) and the income level (1=less than \$21,000, 2=\$21,000-\$31,000, and 3=more than \$31,000, measured in 1996 dollars). Cross tabulations of these three measures at each of the three points in time show fairly distinct patterns of welfare, education and income at both the top and bottom of the distribution for the combined measure. Mothers with a combined score of three or less, for example, generally used welfare for all five years, had less than a high school education and were in the lowest income group. Only a handful had a high school diploma, while just one had an income of more than \$21,000. Mothers with combined scores of more than seven also had fairly distinct patterns where all had

Table 1: Descriptive Characteristics of the Baltimore Sample

Variable	Mean (SD for non-dichot)
<i>Child Characteristics</i>	
Ever Retained	48.1%
PPVT Score at Time 4	80.4 (26.8)
Sex (female=1)	50.6%
Race (black=1)	93.7%
<i>Mother Characteristics</i>	
Low SES at Time 4	25.3%
Middle SES at Time 4	47.8%
High SES at Time 4	26.9%
Age at First Birth	16.1 years
Number of Additional Births	.80 (.81)

graduated from high school or attained additional education, and had incomes of at least \$21,000. Based on these fairly distinct patterns of welfare, education and income, with unique patterns among those with low (three or less) and high scores (seven or more), we divided the combined measure of SES into three categories.¹

In our models, we also include is a measure of children's performance on the Peabody Picture Vocabulary Test (PPVT). The PPVT is one of the most commonly used cognitive assessments for children. Since children with lower scores on assessments such as the PPVT are more likely to have difficulty in school, it is important to include this control. In this analysis, we use percentile scores of the PPVT as the predictor, as the percentile measure is adjusted for age of child and developmental differences. Maternal factors in the models are closeness of relationship with child (mother-reported), age at first birth, and the number of additional births the mother has had. The distribution of the values of these variables is shown in Table 1.

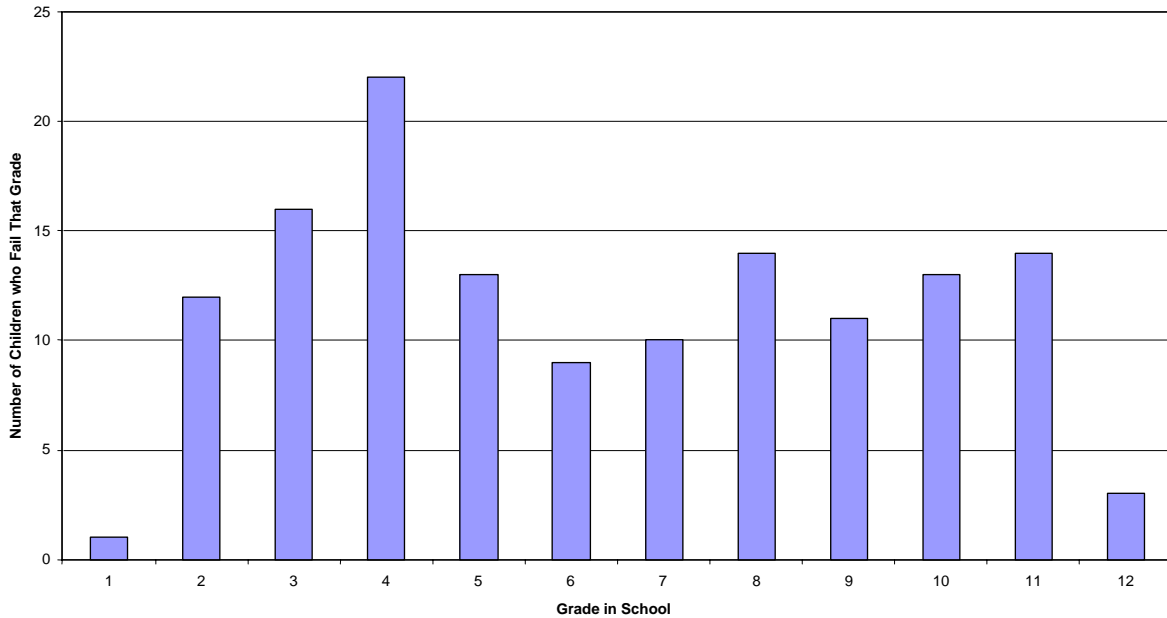
¹ For additional detail on this measure of socioeconomic status, see Foley (2000).

Topography of Failure

Our analysis begins with an examination of the adolescents' educational paths, describing how many students repeated a grade and which grades were repeated. Grade failure was hardly a rare event in this population, as almost as many students failed at least one grade as passed all. Overall, 115 of the 245 cases (48% of the sample) were held back at least once.

Figure 2 documents the grade in which first failure occurs. It shows that retention occurs throughout children's educational careers, with some marked peaks at particular grades. In this sample of children, the percentage of children retained in first grade is low, the lowest percentage of all twelve grades. However, beginning in second grade the number of failures increases sharply through fourth grade, then declines again. Another rise is evident in eighth grade as well as in the middle years of high school.

Figure 2: Number of First Failures, by Grade Failed



It is important to emphasize that the graph displayed in Figure 2 is based only on first-time retentions. An examination of overall grade failure rates for this population would exhibit much higher rates of failure in the later grades. Yet many of those failing in the high school grades have failed a previous grade. In this population, of those that ever failed a grade, 28 percent were retained multiple times.

Another way to examine the risk of grade failure by grade is to look at the percentage of the number who failed a particular grade, relative to the population eligible to fail that

grade. While the data shown in Figure 2 document which grades are most likely to be failed, given that a student failed a grade, it is also useful to know the risk of failure at a particular grade among all those eligible to fail. Examining retention risk over time (data not shown) shows a fairly steady risk of failure, with modest increases in slope at the highest failure years seen in Figure 2. However, overall the likelihood of failure does not appear to increase or decrease dramatically over the life course.

Comparison with other Populations

It is desirable to compare these rates of retention to a national or similar sample; however, national data on grade retention are notoriously difficult to obtain. As Hauser and his colleagues noted in their recent study of grade retention (2000), the National Center for Education Statistics, the primary source of educational data on schools in the United States, has almost no data on the prevalence of retention. Available comparison groups are limited either to specific populations, students in a particular geographic areas (e.g., other cities) or national data that require potentially problematic assumptions to facilitate comparison. For example, a report on retention in Chicago showed similar retention patterns in the early grades for a cohort of public school students in that city (Roderick et al. 2000). A cohort of public school students in Baltimore, who were of roughly similar ages as those in this study, had similar retention experiences in schooling, with almost half having been retained at least once by their eighth year in school (Alexander, Entwisle, and Dauber 1994).

Comparing the overall level of grade retention of this sample with estimates based on age-for-grade data, the experience of these children appears consistent. A recent report found that by the time a cohort of students is between ages 15 and 17, nearly one-third (31 percent) have been held back at least one grade (Jamieson et al. 2001).⁴ Similarly, Hauser, Pager, and Simmons (2000) used data from the Current Population Survey to estimate the retention experience of a cohort of students born in roughly the same time period as those in the Baltimore sample. They found that more than one-third of them have been held back at least one grade. Moreover, they found that between 40 and 50 percent of African Americans in the cohort had been retained at least once. Using an earlier wave of national data, Bianchi (1984) found that for a national sample, the eventual retention rate is nearly 50% for African American males from disadvantaged families. Taken together, the experiences of other populations available for comparison suggest that the retention patterns of the Baltimore Study are not aberrant.

Bivariate Relationship Between Marital Change and Retention

The next step in this analysis is to examine the relationship between changes in mother's marital status and the child's likelihood of being held back in school. Data on the relationship between changes in marital status and grade retention reveal a significant difference in retention by change in status. Of those children whose mothers separated or divorced after the child had begun school, 62 percent had been held back a grade, as compared with 41 percent of those whose mother did not separate or divorce.

Multiple Regression Analysis

Extending these results, multiple regression analysis shows that the differences observed in the bivariate table persist in multivariate analysis. The figures presented in Table 2 are

the results of logistic regression analysis examining the odds of being held back at least once at any point during primary and secondary schooling. The first column shows results for any type of change in marital status (changes into and out of marriage), the second examines those changes in which the mother enters marriage, and the third shows the effects of separations and divorces.

Table 2: Logistic Regression Analysis of Effects of Marital Change on Grade Retention
(Reported coefficients are untransformed logits)

	Model 1	Model 2	Model 3
<i>Child Characteristics</i>			
PPVT Score at Time 4	-.0054 (.0056)	-.0049 (.0054)	-.0045 (.0056)
Sex (female=1)	-.7249 * (.2985)	-.8205 ** (.2920)	-.8044 ** (.2997)
Age	-.2090 (.2061)	-.2877 (.1993)	-.2178 (.2087)
Race (black=1)	.2243 (.6242)	.2500 (.5950)	.1876 (.6208)
<i>Mother Factors</i>			
M's report of relation with Child	-.3031 (.2157)	-.2882 (.2093)	-.3378 (.2193)
SES at Time 4	-.2350 *** (.0576)	-.1937 *** (.0545)	-.2429 *** (.0582)
Age at First Birth	.2836 * (.1403)	.2710 * (.1387)	.2552 (.1401)
Number of Additional Births	.4939 ** (.1403)	.5099 ** (.1910)	.3910 * (.1941)
Any change in status	1.036 *** (.3044)	--	
Mother married	--	.3625 (.3169)	
Mother Sep/Div	--		1.240 *** (.3292)
Constant	-1.123	-.3728	-.2367
Pseudo R2	.151	.119	.160

* p<=.05 ** p<=.01 *** p<=.001

Two of the model results, in particular, merit some discussion. First, the only sociodemographic predictor significantly related to grade retention is gender, with females having a significantly lower risk of being held back than males. Neither age nor race has a significant impact on the odds of retention. Perhaps more surprising is the fact that PPVT scores at the time the child was about to enter school is unrelated to the odds of being held back during their schooling career.

The middle panel of the table contains data on characteristics related to mothers. Of the four factors, three have a significant relationship with the odds of retention. Mothers' socioeconomic status at the time the child is about to enter schools is negatively associated with the likelihood of failing a grade, such that children whose mothers had higher SES in 1972 (when the children were about 5 years old on average) were less likely to be held back during their schooling career. Mothers' age at first birth also is a significant predictor of the odds of retention in both Models 1 and 2, though the effect is in the opposite direction than expected. That is, the older the mother at the time of her child's birth, the greater the odds of retention. Although this result is somewhat counter-intuitive, one way to explain it is that younger mothers in this sample were more likely to continue living at home after the birth than the older members of the sample. The older mothers among these were more likely to enter early marriages and end up divorced, while younger mothers were not. The results of the model also show that the odds of failure are increased for mothers with a greater number of additional births.

The lower panel of Table 2, reporting effects of change in marital status, tells a story similar to that of the bivariate section of this analysis. The data in the first column show that any changes in marital status increases the odds of retention significantly, net of other factors. The other columns of the table examine entry into marriage and exit from marriage separately. Results in the middle column show that entering into marriage has virtually no effect on the odds of a child being retained in school, while the final column shows a substantial effect of separation or divorce. Children whose mothers separate or divorce while the child is in school have odds of being held back that are nearly two-and-one-half times those whose mothers do not separate or divorce.

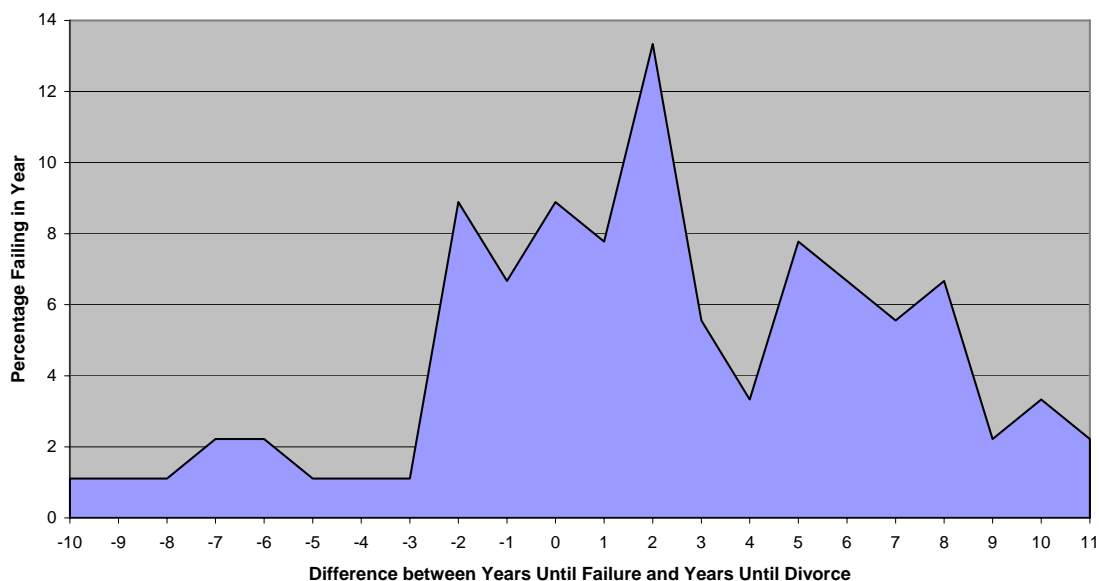
Timing of Divorce and Retention

Another way to examine the link between divorce and grade failure is to examine the timing of both events in an adolescent's life. Because life calendar data show when these two events occurred, we can examine how the timing of both events is related. A first step in that process is to examine the difference between divorce and retention, a value expressed in the number of years between the two events. To do this, we created a simple measure of difference by subtracting the year in which retention occurred from the year the mother divorced. Negative values on this measure reflect those retentions that occurred before the mother's divorce, while positive values are cases where divorce occurred before retention. For example, a case with a difference score of -4 is one in which the child was retained four years before the mother divorced, while a case with a value of 2 experienced failure two years post-divorce.

In Figure 3, this difference score is used as the x-axis with the y-axis containing the percentage of students retained at that point, for all children in the sample who experienced divorce while they were in school.

As the data presented in the figure show, the great majority of retentions occur in the five-year period that begins two years before divorce. A fraction of the population is retained at earlier points, although the percentage climbs remarkably between two and three years pre-divorce, from roughly 1.5 percent to nearly 9 percent. Moreover, the percentage remains high for a period thereafter, reaching its maximum value two years after divorce, when more than 13 percent of retentions occur.

Figure 3: Relationship between Timing of Divorce and Timing of Retention



It is interesting to note that the sharp increase in the percent retained starts not at year 0, the year of divorce, but two years prior to marital dissolution. One hypothesis for this result, though it is one that cannot be tested with these data, is that the sharp increase in retentions in the period immediately prior to divorce is due to marital conflict and stress in the household. Such findings are consistent with research on the effects of marital separation and stress on children’s outcomes, which find that the actual divorce may not mark the beginning of children’s difficulties (e.g., Cherlin et al. 1991). Through this simple analysis, it appears that timing of divorce is highly related to the timing of grade retention.

Hazard Analysis

We then employed Cox proportional hazard models to examine the effects of a set of disruptions on children's educational trajectories, examining the impact of both fixed and time-varying predictors (Cox 1972). Hazard models are particularly useful in estimating the duration of time until some event (here, the first event of grade retention) and when there is some censoring of data (Cox and Oakes 1984). In the Baltimore data, some of the youngest group of students had not yet completed high school and therefore were at risk of retention beyond the point of data collection.

The hazard models contain the same set of child- and mother-level controls as the regression models. All of these control variables are treated as time-stable in the model, with only the measure of separation or divorce as a time-varying predictor. Coefficients for these hazard models are interpreted similar to non-exponentiated logistic regression coefficients, so that negative values indicate less relative risk and positive values indicate greater relative risk. With the exception of the time-varying covariate, these models assume that the relative risks of retention associated specific covariates remain constant throughout the period of observation.

Table 3 presents results of the hazard analysis that investigate the effects of child-level, mother-level, and timing of divorce effects on the odds of repeating a grade in school. The first model contains only child-level predictors, while the second adds the mother-related factors and the third has both of these as well as the time-varying measure of marital disruption. The results presented in models 1 and 2 closely mirror those of the regression results presented in Table 2. Females are significantly less likely to be held back than males. Additionally, socioeconomic status is negatively related to the odds of failing, while the number of additional children a mother is positively related.

Table 3: Estimated Hazard Ratios from Cox Proportional Hazard Model of Factors Influencing the Timing of Grade Retention

	Model 1	Model 2	Model 3
<i>Child Characteristics</i>			
PPVT Score at Time 4	.9920	.9927	.9928
Sex (female=1)	.5787**	.5535**	.5824**
Age	.8313	.7506	.7881
Race (black=1)	1.244	1.161	1.039
<i>Mother Factors</i>			
M's report of relation with Child		.8423	.8576
SES at Time 4		.9058***	.8841***
Age at First Birth		1.161	1.148
Number of Additional Births		1.458**	1.376**
Period after Mother Separates/Divorces			1.851***

Note: Figures are expressed as hazard ratios.

* p<=.05 ** p<=.01 *** p<=.001

The most striking result in this table, however, is the effect of mothers' separation or divorce. A child who experiences such a disruption in home life has substantially greater odds of repeating a grade, relative to those who do not. Moreover, since the measure of mothers' separation or divorce is included as a time-varying predictor, the coefficient of the model shows that separation or divorce has a profound and near-immediate impact on children's performance in school. Thus, the results of the hazard analysis lend further support to the effects presented in Figure 3. They attest to an effect of divorce on children's performance in school that is focused near the time of divorce or separation. Stated differently, the results of Table 3 offer persuasive evidence that the likelihood of being held back in school increases substantially at the point of marital dissolution.

CONCLUSION

The analyses presented in this paper show that events in parents' lives may have a sharp and significant impact on the lives of children. Although researchers have long known that children from divorced or single-parent families do worse in school than those from two-parent families, many questions about the timing of divorce effects have persisted. More generally, the literature on the effects of divorce on children's well-being has offered a number of hypotheses and some evidence about whether and how the timing of dissolution affects outcomes, but we still know relatively little about timing. This paper advances our understanding of how timing matters. The results presented here show a substantial increase in the likelihood of grade retention starting two years before separation or divorce, lasting three years following the event.

These results are consistent with longitudinal studies of the emotional impact of divorce on children. In their work with the National Child Development Study, Cherlin et al. (1998) found that children who experienced a parental divorce between the ages of 7 and 22 had a greater degree of emotional problems than other children at age 7 (prior to the divorce) and as adults. This suggests that the existence of emotional problems prior to the divorce may stem from family stress or conflict in the household in the predissolution period. It may also be that children's pre-existing emotional problems influence the likelihood of divorce. Thus, one explanation for why we see an association between divorce and grade retention 2 years prior to the actual divorce, may be that the children of parents who divorce have a greater degree of emotional problems that interfere with schooling.

The impact of divorce on grade retention shown in this study also sheds light on the diverging emotional trajectories between children who experience a parental divorce when they are younger and those who experience a parental divorce after age 23—or who never experience one at all. In trying to explain why the emotional trajectories continue to diverge over the lifecourse, Cherlin and colleagues (1998) suggest that parental divorce may influence adult well-being by cutting short education. Our study shows that divorce clearly has an impact on grade retention. Grade retention, in turn, has been shown in other studies to be a strong predictor of academic difficulties as well as later life problems (e.g., Alexander, Entwisle, and Kabani 2001; Brooks-Gunn, Guo, and Furstenberg 1993).

The findings from this study will enrich our understanding of how parental life events influence children's educational outcomes, particularly whether some of these events have lagged and lasting effects on children. Such knowledge should contribute to our knowledge of the pathways of intergenerational transmission of advantage and disadvantage, and help policy makers and educators in their efforts to improve the academic performance of adolescents at risk for educational failure.

In conclusion, the results of our study on the timing of the impact of divorce on grade retention suggests that there may be a critical period two years prior to and three years post divorce in which the likelihood of retention is highest. Targeting interventions to children whose parents are known to be divorcing during these years may help prevent the academic failures leading to grade retention and the stem the widening gap between children whose parents divorce and those whose do not.

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ENDNOTES

¹ The term "study child" refers to the child born to the mother at her pregnancy through which she became part of the study.

² Although basing our retention measure on data taken before all students have completed the traditional schooling years introduces potential problems, we lose few cases of retention by this choice of measure. This issue is discussed further in the section on hazard analysis.

³ We include both forms of marital transitions (marriages and separations/divorces) because of some studies that have suggested that both forms should have similar impacts on children's and adolescents' educational outcomes (e.g., Wojtkiewicz 1993).

⁴ Jamieson et al. point out the inherent limitations of using age-for-grade data in noting that "[e]nrollment below the mode in school could be due to late entry into school or to falling behind after entering school" (2001: 6). This factor presents substantial issues for interpretation, given the lack of uniform standards for age of initial enrollment and parental flexibility in choosing when to enter their children in school.



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