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Labor Market Decisions, Children's Health, and Divorce

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Abstract

There are numerous contributing factors that should be taken into account in any marriage or divorce decision. This paper examines the interaction effects of a child's health with other important factors on the likelihood of divorce, such as labor market decisions and the type of divorce legislation in place. Most often, children are treated as a quasi-public good that enhances marriage quality. However, if the child is sick, the appeal of the marriage decreases. Likewise, living in a state with a unilateral divorce legislation decreases the costs of divorce, which implies a higher likelihood of divorce. When both parents work full time in the market, there may be less time available to devote to addressing any problems or to enhance the quality of the marriage. The interaction of the effects of decreased divorce costs through unilateral divorce legislation, both parents working full time in the market, and an unhealthy child is shown here to play a role in the stability of marriages and the decision to divorce. The main finding of this paper shows that interaction effects do in fact exist and account for 24 percent of the total effect of having both parents working full time in the market and 49.8 percent of the total effect of having an unhealthy child. This interaction is significant at a 95 percent confidence level. The direct effect of these shocks is also shown to be significant.

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1 Introduction

The existence of children in a marriage can dramatically change the interactions between the parents. Most often, children are treated as a quasi-public good that enhances the marriage quality. Indeed, many researchers find that the existence of children in a marriage not only increases the overall welfare of the parents, but also decreases the likelihood that the parent's will divorce. Most people who decide to have a child will give birth to a healthy child. However, there is an unfortunate minority who will give birth to children who are born with defects that will require a doctor's attention. If this condition is chronic, then the unhealthy child may place additional strain on a marriage; if these strains are great enough, the couple may even decide to divorce. This paper empirically explores the relationship between the health of a child with the likelihood that their parents are divorced. The child's health is also interacted with other key variables, such as labor market decisions and divorce legislation, which allows for cumulative effects of the individual stresses.

Several factors must be taken into account when a couple decides to divorce. The type of divorce legislation that is in place, be it unilateral, where only one partner needs to desire a divorce before one is granted, or mutual consent, where both parties must consent to the divorce, can serve to induce divorce or prevent it. Since the unilateral divorce revolution in the early 1970s, 28 states introduced some form of unilateral divorce legislation. As of 2002, 34 states had some form of unilateral divorce legislation in place. In states where mutual consent divorce legislation is in place, both partners need to agree to the divorce before one is granted. This serves as a barrier to divorce in marriages in which only one partner desires a divorce. Unilateral divorce legislation decreases the economic cost of divorce and further serves to encourage divorce as only one partner needs to consent before a divorce is granted.

Divorce can have important economic implications for both the parents and the child. According to the Census Bureau, roughly 50% of marriages in the United States end in

divorce. As of 2002, 23% of children under 18 lived with their mother only. The overall proportion of persons married has also gone down over time. As of 2002, 59% of the population was married. This is down from 72% in 1970 and 62% in 1990[1]. The percent of people who have never married by the age of 35 is 23 percent for males and 16 percent for females as of 2002. These facts are important for several reasons. Pedersen, Rubenstein, and Yarrow (1979) found that infants raised without fathers were less cognitively competent than infants raised in two-parent families even though mothers in single- and two-parent families behaved similarly. Children from single-female-headed households are more likely to drop out of high school, less likely to attend college, and experience teen births. Children who come from single-parent households also tend to earn less income in their adulthood (McLanahan and Sandefur, 1994). Divorce decisions can affect not only the distributions of marital surplus before the divorce occurs, but the individual decision to work or stay home after the divorce.

The fact that an unhealthy child may destabilize a marriage has not only important economic implications but can also have important policy implications. Between 1996 and 2004, 7.9% of all children born were underweight, with 1.5% having a very low birth weight[2]. As of 2006, 15.8% of individuals had no form of health insurance. Unhealthy children need more time and resources than their healthy counterparts. This makes them more likely to be subject to the economic hardships that often follow divorce. Fertig (2005) finds that parents of less healthy children in the United States were 50% more likely to divorce. This was not the case in the United Kingdom, which has a universal health care policy. Specific policies may be needed to deal with the needs of disabled children who live with a single parent, or to reduce the stresses on couples who are raising disabled children.

Fertig's 2006 findings that unhealthy children in the United Kingdom, where there is a universal health care system, do not significantly increase the incidence of divorce, can

[1] http://www.divorcemag.com/statistics/statsUS.shtml
[2] http://209.217.72.34/HDAA/TableViewer/tableView.aspx?ReportId=224

have some potentially interesting policy implications in the United States. As noted in the introduction, divorce can have severe economic consequences for not only the couple divorcing but for their children as well. Currently in the United States, there is a debate over whether to provide universal health care to all individuals. Specific policies have been proposed, such as the S-chip, which would provide free health care for the poorest. Universal health care could help to prevent certain birth defect by providing for pre-natal care and care for both the mother and the child after birth. This would help alleviate the effects of unhealthy children on divorce and thus divorce's negative consequences. As contentious as universal health care is in the United States, health care subsidies that would be used to help offset the cost of health care could be introduced as an alternative.

In Snipes (2007), I developed a theoretical model that examines the effects of a child's health on the parents' decision to divorce. It incorporates many decisions typical to any marriage including the decision to work at home or in the market, sharing of marital surplus, post-divorce transfer payments, and child custody and examines the role of a child's health on the decision to remain married or divorce.

The model shows that so called "career couples", households where both parents work in the market, will divorce more easily in the presence of a child that requires a doctor's supervision under a unilateral divorce regime than couples where the one parent works at home. However, under a mutual consent regime, couples in which one parent works in the home divorce more easily in the presence of a child that requires a doctor's supervision. This is because under mutual consent laws, the partner who does not wish to divorce is worse off in divorce and will require a higher post-divorce transfer from the partner desiring the divorce in order to be willing to divorce. If the husband can not afford to offer a higher transfer, the couple will not divorce.

Among couples where both parents work in the labor market, a healthier child is necessary in order to maintain the marriage, assuming that children are quasi-public goods that increase

the gains from marriage. This is due to the fact that under mutual consent laws, the partner who retains custody of the child is worse off in divorce as they will have to accept more of the negative shock of a sick child. This implies that the custodian will require a higher post-divorce transfer from the non-custodian partner in order to be willing to divorce. The model demonstrates that if most households contain parents where both work in the labor market, then a switch from a mutual consent divorce law to a unilateral divorce law will increase the number of divorces that occur. If the partner who doesn't retain custody of the child can not afford to offer a higher post-divorce transfer, the couple will not divorce.

Conversely, if most households contain parents where the mother or the father stays at home, then a switch from mutual consent legislation to unilateral legislation should not induce an increase in the divorce rate. The reason for this is that when both parents are working in the labor market, their respective incomes are closer to being equal than if one of the parents worked in the home. As the transfer from the one partner to the other is a proportion of their income, the partner desiring a divorce will have to transfer a smaller portion of their income if the couple divorces. This makes divorce less desirable for the partner not desiring a divorce. This smaller transfer, in addition to an increasing distancing factor that the non-custodial parent receives in divorce, serves to make divorce more attractive for the parent desiring a divorce.

Thus a child's health, parents' labor market decisions, and type of divorce legislation interact to affect divorce. In particular, the theoretical framework I developed in Snipes (2007) and that I have outlined here implies the following: 1) states with a unilateral divorce regime will have a higher rate of divorce; 2) the presence of an unhealthy child places additional stress that decreases the attractiveness of the marriage and will cause couples to divorce more easily and; 3) in couples where both parents work full time in the market and live in a state with a unilateral divorce regime, the additional strain and economic cost of an unhealthy child will cause these couples to divorce at a higher rate. These couples require a

healthier child in order for the marriage to remain attractive.

This paper uses the National Longitudinal Survey of Children and Youth 1979 (NLSY79) and develops a probit MLE model in order to empirically test the existence of these interaction effects. Interaction terms are included in the estimation that control for parent's labor force decisions, divorce regimes, and the health of the child along with several controls that are of importance in the marriage-divorce decision. The data covers all years starting in 1979 through 1986 and covers every other year through 2004 and initially surveyed 12686 individuals. Over time, though, individuals dropped out of the survey and so the number of viable observations also decreases over time.

As suggested by Snipes (2007), interaction effects should be taken into account as each variable contributes stress to the marriage individually, but they may also play upon each other, enhancing each other's effects so that they play a larger role than they would individually. This paper takes these cumulative effects into account.

The main finding of this paper shows that interaction effects do in fact exist and account for 24 percent of the total effect of having both parents working full time in the market and 49.8 percent of the total effect of having an unhealthy child. These interactions are significant at a 95 percent confidence level. The direct effect of these shocks is also shown to be significant. The lower economic costs associated with divorce under a unilateral divorce regime coupled with the strains that come from both parents working in the market and the added costs and strain that come with an unhealthy child make divorce a more viable if not more attractive option for parents of unhealthy children. This paper is different in that it takes into account not only factors that could play a large role not only within a marriage, such as the incomes of the two spouses, but also interaction effects that allow the stresses of certain variables to compound each other. Previous papers usually individually examine only one or two of the factors taken into account here and none examine the cumulative effects that they play.

The remainder of this paper proceeds as follows. Section 2 provides a brief review of the literature. Section 3 describes the data used. Section 4 describes the empirical methodology, discusses the results, and examines different specifications and techniques in order to test the robustness of the results and are discussed further in section 4. Section 5 concludes.

2 A Review of the Literature

There is a rapidly growing body of empirical literature that explores how different aspects of a family's circumstances contribute to a decision to divorce. One major strain examines the impact of different types of divorce legislation. Friedberg (1998) finds that unilateral divorce accounted for a six percent increase in the divorce rate in 1988 over what it would have been without the unilateral divorce legislation. She does not, however, take into account how long the legislation had been in effect. Wolfers (2006) finds that liberalized divorce laws, in the sense that "no fault" divorce law adoption, caused a significant increase in the divorce rate, but this effect was only temporary. As the law became older, the initial increase quickly dissipated due in large part to the gradual acceptance of the law as norm and with the rapidly changing roles of women in society. This increase usually lasted for only a decade. The results suggest not only differential spousal bargaining power within marriage but that marriage contracts became more efficient. In another paper, Wolfers and Stevenson (2006), find that increased access to easy divorce, such as in states with no-fault or unilateral divorce laws can increase the well-being of the partner desiring the divorce. Snipes (2007) shows that changes in divorce legislation, that is, switching from a mutual consent to a unilateral divorce scheme, affect divorce rates in different areas differently depending on the number of families in which one spouse stays home while the other works in the labor force. This paper takes not only the type of divorce legislation into account, but also labor market decisions and other factors that contribute to the quality of a marriage. The labor market decisions

of individuals in a marriage can potentially have large repercussions for the stability of the marriage and their roles are examined here.

Other papers explore the role of children. The existence of children is found to play an important role in determining the share of marriage rents that an agent receives (Chiappori, 1997). Weiss and Willis (1997) find that the existence of children also decreases the likelihood of divorce, as do the existence of high divorce costs and types of divorce legislation in place; however, they do not take into account the effects of the child's health. Brown and Flinn (2007) develop a continuous time model that allows for strategic behavior between parents in making child quality investment choices. They find that changes in the family law environment have relatively small impacts on the value of child quality, but that the impact on the welfare distribution of the parents is substantially greater. These papers did not take into account the fact that the child may be unhealthy, which would serve to decrease the appeal of the marriage. While the presence of a child may serve to enhance the appeal of a marriage, the fact that the child is unhealthy will serve to offset some, if not all, of the benefits derived from the child.

Mauldon (1992) explores how a child's characteristics affect the child's experience of divorce instead of the effects of children on adults probability of divorce. She finds evidence that both congenital and non-congenital problems put children at higher risk of parental divorce at every age up to nine. She also finds that older black children are no more likely to experience divorce than older white children; however, younger black children are more likely to experience divorce. She also finds that having a mother who married young increases the likelihood of divorce as do mothers with higher education levels. Fertig (2006) estimates reduced form equations and shows that the presence of sick children, specifically children of low birth weight, increased the likelihood of divorce in the United States by about 50 percent. She further argues that the effect of low birth weight on parental divorce in the United States is causal given that there are few direct channels through which a parents'

divorce can lead to a low birth weight birth, reducing the probability of reverse causality. She also finds that in the United Kingdom, which has universal health care, a child's low birth weight has no effect on divorce. This is due to the fact that the universal coverage helps to mitigate infant health problems. As noted in the introduction, this finding can have some potentially important policy implications.

This paper is an attempt to take into account all of these factors, divorce legislation, labor market decisions, and not only the presence of children but their health as well, that had previously been examined separately. It examines the cumulative effects of these separate stresses while allowing them to be individually significant as well. The stresses examined here all need to be taken into account as they all have the potential to play significant roles within a marriage as well as the decision of whether or not to divorce.

3 Data

In order to estimate the model, the National Longitudinal Survey of Youth 1979 (NLSY 79) is used. The NLSY 79 is a nationally representative sample of individuals who were born in the years 1957 to 1964. This survey was conducted annually from 1979 to 1994 and has been conducted biennially since 1994. Respondents were 14-22 years old when they were first surveyed in 1979. Since their first interview, many of the respondents have made transitions from school to work, and from their parents' homes to being parents and homeowners themselves.

A key feature of this survey is that it collects specific dates for key life events, such as birth dates, marriage and divorce dates, and start and stop dates for jobs. It also includes family status, fertility information, and information on government programs participated in by the respondent and their family. The survey contains an expansive set of questions ranging from child-care costs to welfare receipt. For example, the survey includes detailed

questions on educational attainment, training investments, income and assets, health conditions, workplace injuries, insurance coverage, alcohol and substance abuse, sexual activity, and marital and fertility histories. Starting in 1986, specific questions regarding the children of the original NLSY respondents were also collected every other year thereafter. The data collected in these surveys covered questions about their health, attitudes, reading and comprehension test scores, and several other variables. Starting in 1994, children of NLSY respondents who were at least 15 years old were also interviewed.

Information pertaining to specific divorce laws and child custody and child support payments were obtained from the Cornell University School of Law website[3]. Table 1 lists the years the states first changed to a unilateral divorce legislation. As of 2004, 17 states (including the District of Columbia) had not adopted a unilateral divorce legislation.

3.1 Descriptive Statistics

Table 2 provides descriptive statistics for the sample demographic variables. There are several things worth noting upon examining Table 2, such as the data on the number of children in the household, including biological, step, and adopted children. The average number of children present in the house is increasing over time until 2002. This is to be expected; as the respondents grew older, they became more likely to have given birth. Starting in 2002, the average number of children in the house decreases. This is due to the fact that children who were born early in the survey are now more likely to be adults and are then more likely to have moved out of the house. Coupling this with the fact that, as the respondents got older, they were less fertile and thus less likely to have given birth, helps explain this trend.

The percentage of spouses that work full time remains fairly constant over the sample period with a low of 87 percent to a high of 93 percent. The percentage of respondent's that work full time, however, changes significantly. Starting around 1988, the percentage of

[3]http://www.law.cornell.edu/wex/index.php/Divorce

respondent's working full time rises. In 1988, 43.8 percent of respondents worked full time. By 2002, that number had jumped to 65.81 percent. The percentage of female respondents in the NLSY79 is about 50 percent and this proportion remains fairly constant over the sample period. The percentage of respondents with a high school education or better is 74.6 percent after 1984 and 64 percent over the entire sample. This is at least due in part to the fact that a number of respondents may not have been old enough in 1984 to have yet graduated from high school. The percentage of couples in which both parents work full time in the market is 54.8 percent over the sample period. This is close to the percentage found in the general population, which is around 50 percent.

Descriptive statistics for health measures are given in Table 3. For the purposes of this paper, a condition is considered chronic if it has existed for at least two years. The averages of the health parameters are fairly stable over time. The average percent of households with children that require a doctor's supervision is 9.29 percent over the time period 1986-2004, with a maximum deviation of 1.69 percent. The maximum percentage is 11.1 percent with minimum of 7.6 percent. The percentage of households that have a sick child with a chronic condition also remains fairly stable over time, with an average of 69 percent over the sample period and a maximum deviation of 5.9 percent. The maximum number of children that require a doctor's supervision is four and the maximum number of children that have chronic conditions is also four. This maximum occurs for the same family. There are a number of reasons that could account for the variation in these measures over time. As respondents drop out over time, their children also drop out of the sample. Children could also get healthy or a condition that was once minor may develop into a chronic condition.

For the purposes of categorizing respondents into minority or non-minority status, the survey gave three options: white, black, or other. If the respondent was coded as either black or other, they are coded as minority. The percentage of minorities in the sample, as well as the hours worked per week for both the respondent and their spouse remain fairly

stable over time. If a respondent or their spouse worked more than 35 hours in a week, they are categorized as working full time. If a respondent has finished more than 12 years of schooling, then they are categorized as having a high school degree or better.

4 Empirical Methodology and Results

To test the implications, a probit MLE model will be used. The equation estimated is

$$\begin{aligned} Div_{i,t} &= \beta_0 + \beta_1 income_{i,t} + \beta_2 spinc_{i,t} + \beta_3 agefirst_{i,t} + \beta_4 firstmar_{i,t} + \beta_5 rhrwork_{i,t} + \\ &\beta_6 sphrwork_{i,t} + \beta_7 rhrp_{i,t} + \beta_8 edu_{i,t} + \beta_9 min_{i,t} + \beta_{10} numchild_{i,t} + \beta_{11} spedu + \\ &\beta_{12} uni_{i,t} + \beta_{13} anydoc_{i,t} + \beta_{14} numdoc_{i,t} + \beta_{15} anychron + \beta_{16} totchron + \\ &\beta_{17} unidoc_{i,t} + \beta_{18} unifull + \beta_{19} docfull_{i,t} + \beta_{20} docfulluni_{i,t} + \varepsilon_{i,t}, \end{aligned} \tag{1}$$

where variable definitions are given below.

Missing data issues are particularly problematic in the NLSY79. This occurs for several reasons. Over time, surveyors may lose track of respondents or respondents may simply drop out of the survey if they no longer choose to participate. In 1984, most of the respondents who were in the military were also dropped. These missing data issues prevent the data from being used in its raw form as several issues, such as quasi-complete data separation, arise when standard methodologies are used. In order to combat these issues, the data used in the regressions include mean-value imputations. This process is used in order to prevent quasi-complete separation of the data, which occurs if standard empirical methods are applied to the non-imputed data. Quasi-complete data separation is problematic in that it yields non-unique infinite estimates of the parameters. Alternatives to using mean-value imputation are discussed further later in this section.

In order to address the fact that traditional estimation methods are not able to be used on the raw data, Table 4 provides ordinary correlation analysis between several key variables.

The most important column is column one, which provides correlations between the divorce decision and the key shocks examined in this paper. All variables are positively correlated with divorce, as should be expected. The largest correlation is between the labor market decision and the decision to divorce. Also of note are the correlations between the "shock"

Variable	**Definition**
Div	indicator equaling one if the person is divorced and zero otherwise
income	log of the income of the respondent
spinc	log of spouse's income
agefirst	respondent's age when their first child was born
firstmar	respondent's age when they first married
rhrwork	number of hours worked per week for the respondent
sphrwork	number of hours worked by the respondent's spouse
rhrp	log of the respondent's hourly rate of pay
edu	respondent's education level
min	indicator that equals one if the respondent is a minority
numchild	number of children present in the household, including biological, step, and adopted children
spedu	education level of the respondents spouse
uni	indicator that equals one if the respondent lived in a state that had a unilateral divorce legislation in place
anydoc	indicator variable that equals one if the household contains any child with condition that requires a doctor's supervision
numdoc	total number of children in the house with a condition that requires a doctor's supervision
anychron	indicator that equals one if the household contains any child with a chronic condition
totchron	total number of children in the household with a chronic condition
unidoc	equals one if the respondent lives in a state in which there is unilateral divorce legislation and also has a child with a condition that requires a doctor's supervision
unifull	equals one if the respondent lives in a state in which there is unilateral divorce legislation and both the respondent and their spouse work full time
docfull	equals one if the respondent has a child with a condition that requires a doctor's supervision and both the respondent and their spouse work full time

variables. We would expect that a unilateral divorce legislation to have a low correlation with the child health variables, as the type of legislation in place should play little, if any, role in determining the health of a child. The fact that unilateral divorce legislation is in place could be taken into account in determining the distribution of marital rents and then in turn these rent shares may affect the health of the child is one avenue that a unilateral divorce legislation could affect a child's health. Examining the column containing containing the unilateral divorce legislation variable, we see that the correlations are indeed low. Similarly, the correlation between living under a unilateral divorce regime and the fact that both parents work full time in the market is very low. The correlations between both parents working full time in the market and the health of the child are also small.

Table 5 provides estimates for the baseline probit regression. The first column shows estimates with limited child health information in order to give baseline estimates for comparison. Column two includes several other child health parameters. Column three includes child health information as well as several interaction variables. This is the main specification. Table 6 provides the marginal effects of the probit estimates and Table 7 provides coefficients for alternate specifications.

4.1 Probit Results

As can be seen from table 5, the coefficient for whether or not a child with a condition that requires a doctor's supervision is present in the house is positive, indicating that a child's adverse health plays a role in the parents deciding to divorce. However, the coefficient is insignificant in the main specification, with a p-value of 0.15. In columns one and two, however, the presence of an unhealthy child is a significant factor in the parent's decision to divorce at at least a 90 percent confidence level. According to Table 6, the presence of an unhealthy child increases the likelihood of divorce by about 2 to 2.6 percent at the average. This positive relationship is in line with Fertig (2006) who also found that parents

of unhealthy children were more likely to divorce, although the effect found here is less than what was found there. One way we can interpret this finding is to say that the coefficient on the health measure implies that the economic costs of staying married are increased, or alternately that the gains from marriage fall. Snipes (2007) argues that the adverse health of the child introduces a shock that reduces the utility of both parents in a marriage. In divorce, then, at least one parent is better off in divorce as they will not have to bear the full brunt of the burden of the sick child, assuming that only one parent has primary custody. The estimate for total number of children requiring a doctor's supervision is negative but insignificant, with a p-value of 0.509.

Table 5 shows that an increase in the total number of children with a chronic condition present in the household increases the likelihood of divorce. The estimate for the total number of children with a chronic condition is positive at 0.2161 and is significant at a 95 percent confidence. Table 6 implies that each chronically ill child increases the likelihood of divorce by about 3 percent. This is not surprising as a chronic condition is more likely to be around to stay. We would expect that the more children with a chronic condition that exist in a household, the larger would be the associated costs and strain and would thus be more likely to induce divorce. The fact that the condition is chronic means that the costs associated with the sick child are also prolonged and the marriage will therefore have to endure the shock for a much longer time, if not forever. In a marginal marriage where only one partner desires a separation, divorce may temporarily be able to be prevented through such mechanisms as intra-household reallocation of resources. For example, one partner may have to leave the labor market and stay at home with the child. However, these reallocations may not be a sustainable arrangement over time and the temporary fix may not be enough to stop divorce over time; the increased stress of having more chronically ill children will eventually win in the long run and the couple will divorce.

An interesting observation can be obtained by comparing the estimate for the total

number of children in a household with a chronic condition with the estimate for any child having a chronic condition. The estimate for the total number is larger than the estimate for any child. When a child with a chronic condition is born, two things happen in the model: the dummy variable for any child with a chronic condition is "switched on", going from zero to one, and the total number of children with a chronic condition goes from zero to one. Therefore, the net effect of the first child with a chronic condition on the divorce decision is the difference between the two estimates. This implies that the first child with a chronic condition increases the likelihood of divorce by about 1.4 percent. The coefficient on the total number of children with a chronic condition is not only larger than the coefficient on any child, but it is also significant, implying that the total number of children with a chronic condition plays a larger role in the divorce decision than the mere presence of a chronically ill child. Separate estimations were run in which only the total number of chronically ill children was included and in which the parameter for any chronically ill child being present was included. Both the significance and the magnitude of the effects did not change significantly.

The coefficient on unilateral divorce legislation is also positive and significant at a 95 percent confidence. The probit estimate is 0.1382 and is significant at a 95 percent confidence, implying that, ceteris paribus, couples that reside in a state with a unilateral divorce legislation are about 2 percent more likely to be divorced at the average. These findings are in keeping with the findings of Wolfers (2006), who found that not only did a switch to a unilateral divorce regime increases that likelihood of divorce, but also made marriage contracts more efficient. One way to think about this is that a unilateral divorce legislation allows for easier access to divorce. This decreases the economic costs associated with staying in a marginal marriage by allowing the partner desiring the divorce to do so. This will increase the likelihood of a divorce in a marginal marriage. For a couple in a marginal marriage living in a state with a mutual consent divorce legislation, both partners must consent to a

divorce before one is granted. Marriage contracts in this case will not necessarily be efficient. This is not the case under a unilateral divorce regime. Under a unilateral divorce regime, the partner that desires the divorce can now leave. Further, it may serve to enhance the efficiency of marriage contracts by providing more perfect information pre-marriage.

The coefficients on the hours worked per week in the market by the respondent and their spouse are negative; however, only the estimate for the spouse is significant in all specifications. These estimates imply that for every additional hour the spouse worked in the market, the couple is about 0.05 percent less likely to be divorced. These estimates, however, are small and their marginal effects are correspondingly small. At least part of this effect could be explained by the fact that, up until 1989, most of the respondents did not work full-time in the market. Any additional income that is brought into the household from working an extra hour (up until full-time) would then more than likely be seen as a positive addition to the marriage and would thus decrease the probability of divorce.

What is much more important than the changes in the number of hours worked is the estimate for both parents working full time in the market. This effect is large and significant in all specifications, with an estimate of around 0.46 at a 95 percent significance. This implies that if both parents work full time in the market, ceteris paribus, they are around 7.5 to 8 percent more likely to be divorced. There are several reasons why this might be so. If both partners work full-time outside of the home, there will be less time to devote to the marriage and to each other. If problems arise, be they health related or otherwise, there may not be as much time to address and settle these issues before they become serious and potentially marriage ending. Less time will be spent toward enhancing the quality of the marriage or simply gaining pleasure from each other's company, decreasing the attractiveness of the marriage. The added stresses that often come with a full-time job, such as working overtime or the strains from trying for promotions, can spill over into the marriage and cause strain that would otherwise not necessarily be there. The magnitude of the estimates for

both parents working full time are robust to changes in specification as is their significance.

The respondent's income is also shown to play a role in the divorce decision. As their income increases, they become more likely to divorce. Note, however, that the estimate for the respondent's spouse's income is negative. If the respondent's income increases, divorce may appear more attractive to an individual in a marginal marriage. If that individual has a higher income and is better able to support themselves alone and not necessarily have to rely on the income of their partner, leaving a failing marriage may be a more viable and attractive option. On the other hand, if a partner's income is higher, the marriage becomes more attractive as the household income is higher. The respondent may also be dependant on their spouse for their income. A higher income earned by the spouse may induce the respondent not to divorce when it might otherwise seem a viable option. These results are somewhat surprising as we would expect an income effect on the probability of divorce, where income, regardless of its source, serves to decrease the likelihood of divorce. Snipes (2007) shows that when both parents work full time in the market, their incomes will be more similar. As post-divorce transfers are a proportion of income, the party who is ordered to make payments will have to transfer a smaller portion of their income. This will serve as a deterrent to divorce.

The coefficient on the age at first marriage is negative and significant at a 95 percent confidence level. This implies that the longer the respondent waited to get married, the less likely they are to divorce, with respondents becoming about 1.2 percent less likely to divorce with each additional year. The longer an individual waits to marry, the more life decisions are made prior to the marriage. This provides signals to potential mates prior to marriage as to what can be expected during the marriage. This is as expected. However, the coefficient on the age at which the respondent had their first child is positive. This is somewhat surprising. One would expect that the longer an individual waits to have a child, the longer the partners will be married, assuming that they are married, and the marriage will

have time to stabilize before the shock of a child is introduced into the household. Younger parents may also not be able to handle the additional stress of a child. The estimate shows that this is not the case. The education levels of both the respondent and their spouse are both positive and significant. Education decisions as well as labor market decisions that are made before marriage provide a potential partner with information that may serve to better match individuals before marriage which in turn makes for more stable marriages. If an individual puts off getting married or having children, then these decisions are more likely to be made. Minorities are more likely to be divorced in the sample. However, the estimate for minorities is insignificant.

Three interaction terms are included in the main specification and in all other alternate specifications.[4] There are three possible interactions between the three key variables, *unidoc, unifull*, and *docfull*, where the definitions of each are given in the table above. Table 5 shows that the interaction between both parents working full time in the market and the presence of an unhealthy child is negative and significant at a 95 percent confidence. The estimate is -0.1585, which implies that this interaction decreases the the likelihood of divorce by about 0.02602 percent. In order to obtain the total effect of an unhealthy child and both parents working full time in the market, one needs to add both the direct effect, given as the marginal effect of the variable itself, with the interaction effect. Doing this shows that the interaction effect accounts for 24 percent of the total effect of having both parents working full time and 49.8 percent of the total effect of an unhealthy child. Seventy six percent of the effect of having both parents working full time in the market and 50.2 percent of the effect of an unhealthy child is then driven by direct effects. This shows that interaction effects do indeed play a role in the divorce decision and should be taken into account when estimating the determinants of divorce. The effects of the individual variables not only play

[4]When the interacted variables are both dummy variables, the interaction effect is the discrete double difference: $\frac{\Delta^2 F(u)}{\Delta x_1 \Delta x_2} = \Phi(\beta_1 + \beta_2 + \beta_{12} + X\beta) - \Phi(\beta_1 + X\beta) - \Phi(\beta_2 + X\beta) + \Phi(X\beta)$

a role independently but they also interact with each other and have a cumulative effect that is not captured when considering the variables individually. A three way interaction term combining all three effects was also included in similar estimations used here. However, the effect was always insignificant and is thus not included here. The other two interactions considered are insignificant with p-values of 0.268 for *unidoc* and 0.261 for *unifull*. Snipes (2007) predicted that the interaction between a unilateral divorce legislation and both parents working full time in the market should induce divorce. However, this effect is not shown in the data.

4.2 Alternate Specifications and Methodologies

Table 7 provides alternate specifications to check the robustness of the primary estimates in table 5. Table 7 includes estimates on differences in education, hours worked per week, and income between individuals in a marriage. All differences are the respondent's levels subtracted from their spouse's levels. This is done in order to test whether or not it is differences in individuals that drives the decision to divorce. This is not an unreasonable assumption as Aiyagari, Greenwood, and Guner (2000) find that individuals who have similar characteristics are more likely to marry each other.

The estimate on differences in education is negative and significant, indicating that as education differences become more disparate, the couple is less likely to divorce. Differences in their hours worked per week is also negative and significant. As the differential in number of hours worked in the market increases between the respondent and their spouse, the likelihood of divorce decreases. This is not all too surprising in that if one partner spends more time in the home and less time in the market, this may serve to stabilize the household situation. Table 7 also presents estimate on income differences. As incomes become more disparate, the likelihood of divorce decreases. These findings are contrary to the findings of Aiyagari, Greenwood, and Guner (2000) who find that individuals whose incomes are similar

are more likely to marry each other and less likely to divorce once married. More importantly, the magnitudes, signs, and significance levels for the estimates of the other variables remain fairly constant throughout all specifications, showing that the results presented above in section 4.1 are robust to changes in specification.

As mentioned above, missing data issues are of particular importance in the NLSY79. Therefore, the data used in estimation include mean-value imputed data. One alternative to this is multiple imputation. This process was first developed by Rubin (1987). Instead of filling in a single value for each missing value, Rubins multiple imputation strategy replaces each missing value with a set of plausible values. This replaces missing observations with values that reflect the uncertainty in the missing value. By allowing more than one value on a missing variable to be estimated, multiple imputation corrects for sampling variability. Missing values are filled in using a Markov Chain-Monte Carlo (MCMC) simulation. A Markov chain is a sequence of random variables in which the distribution of each element depends on the value of the previous one. In MCMC, one constructs a Markov chain long enough for the distribution to stabilize to a common distribution. In essence, this method takes into account all available information and predicts plausible values for missing data. This method was attempted but abandoned as it failed to obtain convergence in distribution for the missing values.

Robust errors were also taken into account when estimating equation (1). Robust errors seek to provide methods that emulate classical methods, but which are not unduly affected by outliers or other small departures from model assumptions. The probit regression was run using both robust and non-robust errors. The resulting estimates were negligibly different; therefore, the results presented here use robust errors.

5 Conclusions

There are numerous contributing factors that need to be taken into account in any marriage or divorce decision. These factors may play upon each other and serve to compound any potential problems that the individual factors taken by themselves would not capture. This paper examines the interaction between several important variables. Not only can living in a state with a unilateral divorce legislation decrease the costs of divorce, but combining this effect with the fact that both partners spend more time out of the house and the presence of a sick child can greatly decrease the appeal of the marriage. This will in turn increase the likelihood of divorce. The interaction of two of these effects, the stress of an unhealthy child and having both parents working full time in the market, is shown here to be significant. This finding combines several other findings that show that these factors, while individually significant, are also significant when interacted, depending on the effects interacted. This implies that the stresses that accompany having an unhealthy child and having both parents work full time in the market enhance each other and serve as further deterrents to remaining married. This finding has some potentially important policy implications. The effects of a divorce can be significant and long-lasting for both the parents and especially for children. If health care provisions are provided, the effects of an unhealthy child will be reduced by offsetting at least the pecuniary consequences associated with increased medical costs. If pre-natal care is provided, the potentially deleterious effects of an unhealthy child may be offset all together. Increased maternity leave may also help to combat the negative affects of these variables as it will allow a parent to spend more time at home with a new child. This may be especially important since early childhood is of particular importance in the development of cognitive abilities.

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Table 1 - Year of Switch to Unilateral Divorce Legislation Across States

State	**Year**	**State**	**Year**
Alabama	1971	Michigan	1972
Alaska	1935	Minnesota	1974
Arizona	1973	Montana	1973
California	1970	Nebraska	1972
Colorado	1972	Nevada	1967
Connecticut	1973	New Hampshire	1971
Delaware	1968	New Mexico	1933
Florida	1971	North Dakota	1971
Georgia	1973	Oklahoma	1953
Hawaii	1972	Oregon	1971
Idaho	1971	Rhode Island	1975
Indiana	1973	South Dakota	1985
Iowa	1970	Texas	1970
Kansas	1969	Utah	1987
Kentucky	1972	Washington	1973
Maine	1973	Wisconsin	1978
Massachusetts	1975	Wyoming	1977

Table 2 - Parameter Averages

Year	Number of Children in the Household	Respondent Works Full Time in the Market	Spouse Works Full Time in the Market	Percent of Respondents with a High School Degree or Better
1979	0.17	33.4%	87.94%	11.4%
1980	0.12	33.9	89.21	20.5
1981	0.24	40.4	90.5	27.6
1982	0.33	47.6	90.14	39.2
1983	0.42	33.3	88.85	52.2
1984	0.52	26.4	90.26	71.3
1985	0.58	6.3	90.82	80.9
1986	0.68	40.0	91.5	79.9
1987	0.79	*	90.74	77.3
1988	0.91	43.8	89.23	71.6
1989	1.00	50.0	90.97	73.0
1990	1.08	55.6	*	71.2
1991	1.14	16.67	93.0	78.9
1992	1.21	33.3	90.7	75.1
1993	1.28	66.67	88.78	71.7
1994	1.32	61.67	89.63	72.1
1996	1.40	61.73	93.24	73.2
1998	1.46	61.37	93.5	78.8
2000	1.43	65.19	93.82	68.0
2002	1.38	65.81	92.83	80.5
2004	1.29	64.63	92.44	70.7

Table 3 - Health Parameter Averages for Households With Children

Year	Percent of Households With a Child Requiring Doctor Supervision	Average Number of Children Requiring a Doctor Per Household	Percent of Households With a Child With a Chronic Condition	Average Number of Children With a Chronic Condition Per Household
1986	8.3%	0.089	*	*
1988	8.7	0.095	63.1%	0.673
1990	9.6	0.102	66.6	0.719
1992	10.1	0.115	71.2	0.738
1994	9.7	0.109	64.3	0.701
1996	11.1	0.127	67.1	0.767
1998	9.8	0.108	71.0	0.798
2000	10.4	0.114	73.6	0.802
2002	7.6	0.082	72.5	0.781
2004	7.6	0.080	71.4	0.774

* Variable is not available for that year

Table 4 - Ordinary Correlation Analysis

	Divorced	Both Full	Unilateral Divorce	Any Doctor	Total Doctor	Any Chronic
Both Full	0.4214					
Unilateral Divorce	0.0368	0.0068				
Any Doctor	0.0195	-0.0160	-0.0088			
Total Doctor	0.0209	-0.0181	-0.0054	0.9545		
Any Chronic	0.0581	0.0043	0.0049	0.0395	0.0663	
Total Chronic	0.0507	-0.0129	0.00823	0.0740	0.1748	0.8880

Table 5 - Parameter Estimates

Variable	**Estimate 1**	**Estimate 2**	**Estimate 3**
Income	0.0232865*	0.0232088*	0.0232276*
	(0.0018302)	(0.0018311)	(0.0018317)
Spouse Income	-0.0203922*	-0.0204504*	-0.0205366*
	(0.002948)	(0.0029487)	(0.0029489)
Age at First Birth	0.0306396*	0.0305475*	0.0305171*
	(0.0009589)	(0.0009768)	(0.0009769)
Age at First Marriage	-0.0857065*	-0.085869*	-0.0858413*
	(0.0023739)	(0.0023781)	(0.002378)
Hours Worked Per Week	-0.0014138	-0.0014231	-0.0014116
	(0.0012641)	(0.0012646)	(0.001264)
Hours Worked Per Week (Spouse)	-0.003833*	-0.0038508*	-0.0038357*
	(0.0008218)	(0.000822)	(0.0008223)
Both Parents Work Full Time	0.4333244*	0.4320322*	0.4596028*
	(0.0557044)	(0.0557321)	(0.0587161)
Education	0.0280868*	0.0280973*	0.0279103*
	(0.0061167)	(0.0061154)	(0.0061175)
Minority	0.0218805	0.022177	0.0220399
	(0.0141021)	(0.0141071)	(0.0141095)
Number of Children in Household	-0.0250035*	-0.0263055*	-0.0265052*
	(0.006469)	(0.0065427)	(0.0065442)
Spouse's Education	0.0156368*	0.0154999*	0.0155169*
	(0.0039551)	(0.0039564)	(0.0039566)
Unilateral Divorce Legislation in Place	0.1329179*	0.1328536*	0.1381956*
	(0.0132686)	(0.0132695)	(0.0153225)
Any Child Requiring Doctor Supervision	0.1265982*	0.162133**	0.1632278
	(0.035569)	(0.1020086)	(0.1132494)
Total Number of Children Requiring Doctor's Supervision		-0.0586045	-0.0631352
		(0.0935806)	(0.0966967)
Any Child Has a Chronic Condition		-0.1009439	-0.1108165
		(0.096753)	(0.0966967)
Total Number of Children With a Chronic Condition		0.208445*	0.2161044*
		(0.0874862)	(0.0873951)
unidoc			0.0817638
			(0.0725478)
unifull			-0.0353027
			(0.0311489)
docfull			-0.158511*
			(0.0770011)

*Estimate is significant at 95% confidence

**Estimate is significant at 90% confidence

Standard errors are given in parentheses

Table 6 - Marginal Effects of Probit Estimates

Variable	**Estimate 1**	**Estimate 2**	**Estimate 3**
Income	0.0033626*	0.003351*	0.0033519*
Spouse Income	-0.0029447*	-0.0029527*	-0.0029636*
Age at First Birth	0.0044244*	0.0044105*	0.0044039*
Age at First Marriage	-0.0123762*	-0.012398*	-0.0123876*
Hours Worked Per Week (Respondent)	-0.0002042	-0.0002055	-0.0002037
Hours Worked Per Week (Spouse)	-0.0005535*	-0.000556*	-0.0005535*
Both Parents Work Full Time	0.0766403*	0.0763587*	0.0821992*
Minority	0.0031759	0.0032187	0.0031971
Number of Children in Household	-0.0036106*	-0.0037981*	-0.0038249*
Spouse's Education	0.002258*	0.0022379*	0.00222392*
Unilateral Divorce Legislation in Place	0.0189215*	0.0189099*	0.0196494*
Any Child Requiring Doctor Supervision	0.0198901*	0.0260674**	0.0262492
Total Number of Children Requiring a Doctor's Supervision		-0.0084615	-0.0091109
Any Child Has a Chronic Condition		-0.0156272	-0.0172627
Total Number of Children With a Chronic Condition		0.0300096*	0.0311857*
unidoc			0.0315086
unifull			0.0015229
docfull			-0.0260278*

*Effect is significant at 95% confidence

**Effect is significant at 90% confidence

Table 7 - Alternate Specifications

Variable	Estimate 4	Estimate 5	Estimate 6	Estimate 7
Income	0.0232* (0.00184)	0.0231* (0.00184)		
Spouse Income	-0.0205* (0.00275)	-0.0207* (0.00275)		
Difference in Income			-0.0226* (0.00162)	-0.0225* (0.00162)
Age at First Birth	0.0305* (0.000972)	0.0304* (0.000972)	0.0305* (0.000971)	0.0305* (0.000971)
Age at First Marriage	-0.0858* (0.00250)	-0.0858* (0.00250)	-0.0857* (0.00250)	-0.0857* (0.000250)
Hours Worked Per Week (Respondent)	-0.00141 (0.00125)		-0.00141 (0.00125)	
Hours Worked Per Week (Spouse)	-0.00384* (0.000783)		-0.00381* (0.000782)	
Difference in Hours Worked		-0.00210* (0.000602)		-0.00209* (0.000602)
Both Parent's Work Full Time	0.4596* (0.0582)	0.3103* (0.0351)	0.4615* (0.0582)	0.3127* (0.0349)
Education		0.0280* (0.00594)	0.0280* (0.00594)	
Spouse's Education		0.0149* (0.00368)	0.0159* (0.00367)	
Education Differences	-0.0279* (0.00594)			-0.0282* (0.00593)
Minority	0.0221 (0.0141)	0.0231 (0.0141)	0.0212 (0.0140)	0.0223 (0.0140)
Number of Children in Household	-0.0265* (0.00662)	-0.0267* (0.00662)	-0.0269* (0.00660)	-0.0270* (0.00660)
Unilateral Divorce Legislation in Place	0.1382* (0.0153)	0.1380* (0.0153)	0.1383* (0.0153)	0.1381* (0.0153)
Any Child Requiring Doctor Supervision	0.1632 (0.1136)	0.1626 (0.1135)	0.1652 (0.1136)	0.1644 (0.1135)
Total Number of Children Requiring Doctor's Supervision	-0.0631 (0.0938)	-0.0622 (0.0938)	-0.0654 (0.0938)	-0.0643 (0.0938)
Any Child Has a Chronic Condition	-0.1108 (0.0961)	- 0.1076 (0.0961)	-0.1121 (0.0961)	-0.1088 (0.0961)
Total Number of Children With a Chronic Condition	0.2161* (0.0867)	0.2135* (0.0867)	0.2167* (0.0866)	0.2149* (0.0867)
unidoc	0.0818 (0.0727)	0.0807 (0.0727)	0.0821 (0.0728)	0.0809 (0.0727)
unifull	-0.0353 (0.0312)	-0.0371 (0.0312)	-0.0355 (0.0312)	-0.0373 (0.0312)
docfull	-0.1585* (0.0773)	-0.1588* (0.0773)	-0.1588* (0.0773)	-0.1590* (0.0773)

*Estimate is significant at 95% confidence

Standard errors are given in parentheses